## CITY OF COOS BAY

## Transportation System Plan



# $\mathrm{x} \boldsymbol{\mathrm { A }} \mathrm{\theta}$ 

VOLUME 2

August 2020

## VOLUME 2

Title VI and Environmental Justice Memorandum
Public Meetings Summary
Technical Memorandum \#1: Existing Plans and Policies Review
Technical Memorandum \#2: Goals, Objectives and Evaluation Criteria
Technical Memorandum \#3: Financial Funding Forecast
Technical Memorandum \#4: System Inventory
Technical Memorandum \#5: Methodology Memorandum
Technical Memorandum \#6: Current System Conditions
Technical Memorandum \#7: Future Deficiencies and Needs
Technical Memorandum \#8: System Alternatives
Technical Memorandum \#9: Preferred Alternative Selection
Technical Memorandum \#10: Financial Forecast
Technical Memorandum \#11: Policies and Standards
Technical Memorandum \#12: Code Provisions and Ordinance Amendments

The inclusion of an improvement in the TSP does not represent a commitment by the City of Coos Bay or ODOT to fund, allow, or construct the project. Projects on the state highway system that are contained in the TSP are not considered "planned" projects until they are programmed into the Statewide Transportation Improvement Program (STIP). As such, projects proposed in the TSP that are located on a State highway cannot be considered for future development or land use actions until they are programmed into the STIP, or ODOT provides written statement that a project is Reasonably Likely to be funded in the STIP. Highway projects that are programmed to be constructed may have to be altered or cancelled at a later time to meet changing budgets or unanticipated conditions such as environmental constraints.

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$ 。
VOLUME 2

Title VI and Environmental Justice
Memorandum

## TITLE VI/ENVIRONMENTAL JUSTICE OUTREACH MEMORANDUM

Date: July 20, 2018

To: City of North Bend<br>City of Coos Bay<br>Oregon Department of Transportation, Region 3<br>From: Brooke Jordan, Jacobs<br>Drew DeVitis, Jacobs

Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
This memorandum describes the proposed Title VI/Environmental Justice (EJ) outreach strategy to guide the Coos Bay/North Bend Transportation System Plan Updates. The Title VI/EJ outreach strategy is intended to review affected populations and propose methods of outreach to protected population groups, as defined by the U.S. Department of Transportation and Oregon Department of Transportation Title VI (1964 Civil Rights Act) Plan guidance. The Title VI/EJ outreach strategy also describes the broader public involvement opportunities and decision-making process. Additionally, it details outreach activities with assignments of responsibility between the City and consultant team and timelines for completion. The Title $\mathrm{VI} / \mathrm{EJ}$ outreach strategy may be updated during the project to reflect changes in approaches or the project schedule.

## Project Overview

The project schedule below (Figure 1.) outlines the timeline for both the technical work and public outreach processes for the Coos Bay and North Bend Transportation System Plan Update, which is expected to be completed by April 2020. Each TSP will contain policies, strategies, and projects that address the transportation needs of both Coos Bay and North Bend. The Cities, along with ODOT and the consultant team, will provide public involvement opportunities throughout the project, with a focus on key milestones. All meetings will be held in an accessible facility open and welcome to the Coos Bay/North Bend community at large.

Figure 1. Coos Bay/North Bend TSP Schedule


[^0]
## Public and Stakeholder Involvement Goals

In accordance with federal and state Title VI/EJ guidance, the Cities of Coos Bay and North Bend and ODOT are committed to an approach that:

- Provides early and ongoing opportunities for the community to fully engage in the planning process and raise issues and concerns that can be considered through equitable and constructive two-way communication between the project team and the public.
- Encourages the participation of all stakeholders regardless of race, ethnicity, age, disability, income, or primary language by offering alternative accommodations (e.g. translation services, transportation).
- Promotes fair treatment so that no group of people (e.g. racial, ethnic, or socioeconomic group), should bear a disproportionate share of the negative environmental consequences from programs and policies.
- Ensures that public contributions have an appropriate opportunity to participate in the decisionmaking process, can influence the regulatory agency's decision; the concerns of all participants involved will be considered in the decision-making process; and the decision makers seek out and facilitate the involvement of those potentially affected in development of the Transportation System Plan updates.


## Decision Making

In all public communications, it is important to be clear on who is making decisions for the project and how public comments will be used. At each step, stakeholders should clearly understand:

- Who will make the decisions?
- How they can influence the decisions?
- When they will have an opportunity to participate?
- How their input will be considered?

The project decision structure includes the Coos Bay and North Bend City Council, Coos Bay and North Bend Planning Commission, Project Management Team, and Planning Advisory Committee. The project decision-making structure is shown in Figure 2 and is described below.

Decide: Coos Bay and North Bend City Council
The Coos Bay and North Bend City Council will adopt the final Transportation System Plan updates.

## Recommend: Coos Bay and North Bend Planning Commission

The Coos Bay and North Bend City Planning Commission will make a recommendation to City Council on the Transportation System Plan and will provide direction to City staff during the development of the TSP.

## Advise: Project Management Team and Planning Advisory Committee (PAC)

The Project Management Team, comprised of staff from the Cities of Coos Bay and North Bend, ODOT, and the consultant team will make recommendations to the Planning Commission and City Council.

The Project Management Team will use Planning Advisory Committee input in developing recommendations. The Project Management Team will also provide day-to-day guidance to the project manager and consultant team to ensure coordination with related planning efforts.

Figure 2. Decision Making Structure


## Title VI/EJ Demographics Overview

Table 1. provides demographic information from the American Community Survey from 2012-2016 for the City of Coos Bay, City of North Bend, and the state of Oregon to facilitate comparisons and inform the development of outreach strategies to reach low-income, minority, elderly, and limited-English proficient residents.

Table 1. Population Demographics by Geography

| Subject | Coos Bay | North Bend | Oregon |
| :--- | :---: | :---: | :---: |
| Total Population | 16,129 | 9,635 | $3,982,267$ |
| Median Age | 43.3 | 41.4 | 39.1 |
| Population Under 18 Years | $20 \%$ | $24 \%$ | $22 \%$ |
| Population Over 65 Years | $21 \%$ | $21 \%$ | $16 \%$ |
| African American ${ }^{1}$ | $3.7 \%$ | $0.5 \%$ | $1.9 \%$ |
| American Indian And Alaska Native | $1.7 \%$ | $2.5 \%$ | $1.1 \%$ |
| Asian American | $2.4 \%$ | $1.1 \%$ | $4 \%$ |
| Caucasian | $85.5 \%$ | $87.1 \%$ | $85 \%$ |
| Native Hawaiian And Other Pacific Islander | $0.1 \%$ | $0 \%$ | $0.4 \%$ |
| Two Or More Races | $5.4 \%$ | $7.7 \%$ | $4.4 \%$ |
| Other | $1.1 \%$ | $1.0 \%$ | $3.1 \%$ |


| Subject | Coos Bay | North Bend | Oregon |
| :--- | :---: | :---: | :---: |
| Hispanic Or Latino (Of Any Race) | $8.2 \%$ | $9.1 \%$ | $12.4 \%$ |
| Median Household Income | $\$ 39,750$ | $\$ 46,974$ | $\$ 51,243$ |
| All People Living Below The Poverty Level In Last Year | $22 \%$ | $12 \%$ | $16 \%$ |
| People Over 16 Unemployed | $10 \%$ | $9 \%$ | $8 \%$ |
| Households With Food Stamp/SNAP Benefits In Last Year | $27 \%$ | $22 \%$ | $19 \%$ |
| Speak A Language Other Than English At Home | $6 \%$ | $5 \%$ | $15 \%$ |
| Of Which, \% That Are Fluent English Speakers | $68 \%$ | $73 \%$ | $60 \%$ |
| Of Which, \% That Are Non-Fluent English Speakers | $32 \%$ | $27 \%$ | $40 \%$ |
| Sours |  |  |  |

Source: American Community Survey 2012-2016

## Coos Bay Demographics

Based on the American Community Survey from 2012-2016 (estimated numbers), Coos Bay had the following demographics as compared to the state of Oregon:

- Older residents than the state average (average age is 43.3 and $21 \%$ of residents are over 65 years old).
- A similarly diverse population compared to the state average (85.5\% Caucasian), though higher African American population (3.7\%) and American Indian and Native Alaska population (1.7\%).
- Population that makes less income than the state average ( $\$ 39,750$ median household income and $22 \%$ living below the poverty level) and relies more on Food Stamps/SNAP (27\%), and with a slightly higher unemployment rate (10\%) which indicates that more residents are considered "working poor".
- More people speak English at home compared to the state average but of those people that speak another language 32\% are not fluent English speakers. The majority of Limited English Proficiency households speak Spanish at home.


## North Bend Demographics

Based on the American Community Survey from 2012-2016 (estimated numbers), North Bend had the following demographics as compared to the state of Oregon:

- Older residents than the state average (average age is 41.4 and $21 \%$ of residents are over 65 years old).
- A slightly less diverse population than the state average (87\% Caucasian), though higher percentage American Indian and Alaskan Native population (2.5\%).
- Population that makes slightly less income than the state average (\$46,974 median household income) but a lower percentage of people living below the poverty level (12\%) and similar unemployment rate (9\%) which indicates that slightly more residents are considered "middle class".
- More people speak English at home compared to the state average (10\% speak another language), but of those people that speak another language $27 \%$ are not fluent English speakers. The majority of Limited English Proficiency households speak Spanish at home.


## Title VI/EJ Outreach Strategy

Based on the project team's review of area demographics, the Cities could conduct targeted activities to reach low-income, minority, aging adults, limited-English proficient residents and other transportation disadvantaged populations. These activities should make availabe reasonable accommodations -such as translation services, targeted mailings, and public notices-to encourage their participation. To engage these communities, the project team could employ the following strategies:

- Planning Advisory Committee (PAC) meetings: involve the PAC in execution of the Title VI/EJ outreach strategy and consider outreach to and inclusion of members from organizations that advocate for or serve low-income, minority, aging adults, limited-English proficient residents, and other transportation disadvantaged communities, as well as, tribal representation from the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians, Confederated Tribes of Siletz Indians, and Coquille Indian Tribe.
- Targeted outreach: identify partner organizations that can co-host or promote public workshops to traditionally underserved communities, including those that serve low income, elderly, and minority populations. Collect demographic information (anonymously) at all public events to be added to the final report.
- Translation or special accommodations: translation services and other special accommodations will be provided at all meetings upon request.


## Targeted Outreach to Environmental Justice/Title VI Communities

The Cities could conduct targeted outreach to notify Title VI/EJ communities about public events and other opportunities to provide public input on the TSP, involving methods such as a targeted mailing/postcard, fact sheet, poster, press release or newsletter advertisement (online or print). Table 2 and 3 below provides a summary of targeted outreach tasks, and outlines responsibility. The Cities could include a Spanish language message providing instruction on how to request a translator on communication materials about the two public workshops.

As part of targeted outreach, the Cities could work with and provide information to social service agencies and community-based organizations (CBOs) that serve low-income, minority, aging adults, limited-English proficient residents, and other transportation disadvantaged populations. Such organizations may include, but are not limited to the following:

- Oregon Coast Community Action,
- Oregon Department of Human Services-Area Agency on Aging,
- South Coast Head Start,
- South Coast Food Share,
- Coos-Curry Housing Authority,
- Coos Elderly Services,
- North Bend Senior Activity Center,
- NeighborWorks Umpqua,
- Coos Hispanic Leadership Committee,
- SAFE Project, and
- Devereaux Center.

As capacity allows, the Cities could consider conducting focused events during the project to share information with the public and Title VI/EJ communities. These events might include tabling at a public event, such as the Downtown Coos Bay Farmers Market or Bay Area Fun Festival, riding the CCAT Bay Area Loop to circulate postcard ads about public involvement opportunities, or meeting with social service providers.

Table 2. Targeted Outreach Tasks for PAC Meetings

| Task | Responsibility | Schedule | Review |
| :--- | :--- | :--- | :--- |
| Draft outreach materials for targeted <br> distribution to Title/VI communities <br> and CBOs | Cities | 3 weeks before meeting | Cities |
| Draft meeting announcement for <br> website | Consultant | 2 weeks before meeting | Cities |
| PAC agenda and other materials | Consultant | 1 week before meeting | Cities |
| Distribute materials to PAC and post to <br> website | Consultant | 3 days before meeting | Cities |
| Compile PAC summary and share <br> feedback | Consultant | 2 weeks after meeting | Cities |

Table 3. Targeted Outreach Tasks for Public Workshops

| Task | Responsibility | Schedule | Review |
| :--- | :--- | :--- | :--- |
| Draft event announcement for targeted <br> distribution to Title/VI communities <br> and CBOs | Cities | 6 weeks before event | Cities |
| Translate materials as needed | Cities | 4 weeks before event | Cities |
| Distribute event announcement and <br> target distribution to Title/VI <br> communities and CBOs | Cities | 4 weeks before event | Cities |
| Draft meeting announcement for <br> website | Consultant | 3 weeks before event | Consultant |
| Conduct focused outreach events | Cities | 3 weeks before event |  |
| Collect and compile demographic <br> information from public events | Consultant | At Event | Cities |
| Compile event summary and share <br> feedback | Consultant | 2 weeks after event | Cities |

## Stakeholder Categories

The table below summarizes key stakeholders for the TSP, with a focus on Title VI/EJ communities, along with agencies and institutions that serve them.

## Table 4. TSP Stakeholders

| Stakeholder Category | Examples |
| :---: | :---: |
| Low-income, minority, elderly and limited English proficient (LEP) communities | - Oregon Coast Community Action <br> - Oregon Department of Human Services-Area Agency on Aging <br> - South Coast Food Share <br> - Coos-Curry Housing Authority <br> - Coos Elderly Services, <br> - North Bend Senior Activity Center <br> - NeighborWorks Umpqua <br> - Coos Hispanic Leadership Committee <br> - SAFE Project <br> - Devereaux Center |
| Government agencies and institutions | - Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians <br> - Coquille Indian Tribe <br> - Confederated Tribes of Siletz Indians <br> - Coos Bay and North Bend City Council <br> - Coos Bay and North Bend Planning Commission <br> - Coos County <br> - ODOT/ODOT Rail <br> - Department of Land Conservation and Development |
| Schools and Youth | - Southwestern Oregon Community College <br> - Coos Bay and North Bend School Districts <br> - Boys \& Girls Club of SW Oregon <br> - South Coast Head Start |
| Transportation stakeholders | - Coos County Area Transit <br> - Port of Coos Bay/Port Rail <br> - Southwest Oregon Regional Airport |
| Employers and businesses | - Coos Bay North Bend Chamber of Commerce <br> - South Coast Development Council <br> - Coos Bay and North Bend Downtown Associations <br> - Bay Area Hospital <br> - North Bend Medical Center |
| Media | - The World <br> - Oregon Today <br> - KSBA <br> - KSOR <br> - KCBY <br> - KEZI <br> - KMTR |

## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$ o
VOLUME 2

Public Meetings Summary

MEETING SUMMARY

Coos Bay / North Bend
June 7, 2018
Transportation System Plan Updates
KICK-OFF MEETING
2:30 PM - 4:30 PM
Coos Bay City Council Chambers

Attendees:<br>Angela Rogge, David Evans and Associates, Inc.<br>(Consultant Project Manager)<br>Brooke Jordan, Jacobs (Consultant)<br>Jim Hossley, City of Coos Bay<br>Jennifer Wirsing, City of Coos Bay<br>Chelsea Schnabel, City of North Bend<br>Derek Windham, City of North Bend<br>Virginia Elandt, ODOT<br>Jennifer Groth, Southwest Oregon Regional Airport<br>Dick Leshley, Chamber Transportation Committee /Yellow Cab<br>Diana Schab, North Bend Planning Commission

Tom Burdett, Chamber Transportation
Committee/BnT
Rick Skinner, Chamber Transportation Committee /SCCS
John Whitty, Chamber Transportation Committee
Todd Tripp, Coquille Indian Tribe
Jamie Fereday, Citizen (Bicycle)
Jeffrey Stump, Confederated Tribes of Coos, Lower
Umpqua and Siuslaw
Jim Berg, Coos Bay Planning Commission
Sergio Gamino, Coos County Area Transit

## Introductions/Background

The meeting began with a round of introductions. The Consultant Project Manager (Angela Rogge) explained that the TSP Updates are a chance to revisit the 20-year plan for funding and confirm the list of planned transportation projects is in alignment with forecasted land use and population/employment data.

- TSPs are Mandated by the Oregon Transportation Planning Rule (TPR)
- Once the TSP is adopted, it will become the Transportation element of each City's comprehensive plan
- It is a blueprint for the transportation system
- Coos Bay and North Bend data collection, analysis, public involvement will be done concurrently
- There will be separate project lists, revenue forecasts, code/policy and each city will have their own TSP document
The consultant team explained that all modes of transportation would be considered.


## Process/Schedule

The TSP plan development process is expected to last through April 2020.
The technical process for updating the plan will follow these general steps:

- Review Existing Plans/Policies
- Update Goals and Objectives
- Forecast Reasonable Funding through the Planning Horizon (2040)
- Document Needs of Existing Transportation System
- Forecast Traffic Growth for the Planning Horizon Year (2040)
- Document Needs of the Future Transportation System
- Alternatives to Address Needs (Preferred vs. Revenue Forecast)
- Develop Implementation Ordinances
- Adoption


## Public and Stakeholder Involvement

The TSP Update process will have opportunities for the public to follow the process and provide input. There will be two public workshops: (1) to review the existing and future system and collect feedback on identified deficiencies, and (2) Review and comment on the draft plans. There will also be a project website where documents, meeting summaries and project updates will be posted.
Brooke Jordan, of the Consultant team, explained the roles and responsibilities of the Planning Advisory Committee (PAC):

- Provide technical review of key deliverables and analyses (2 week review period)
- Guide development of policies
- Review and comment on draft plan and projects
- Attend 3 PAC meetings (dates to be finalized closer to the meetings, but tentative plan for January 2019, June 2019 and November 2019)
- Review information before meetings
- Express concerns and issues clearly and early on
- Consider issues with a broad perspective


## Common Transportation Terms

Angela reviewed common transportation terms/jargon that PAC members are likely to encounter when reviewing technical memoranda. The analysis will be guided by published methods that are widely accepted by the transportation industry.
Functional classification: Is the grouping of highways, roads and streets by the character of the service they provide.
Level of Service (A-F): Measures the level of delay a driver experiences traveling in a vehicle
Volume-to-Capacity: Measures how well a road or intersection that handle the traffic that wants to use it. Answers the question of whether there is enough capacity to serve the cars.
Bicycle and Pedestrian Level of Traffic Stress: Measures how comfortable a bicyclist or pedestrian is when using a facility.
Travel Demand Model: Helps traffic engineers forecast traffic and is based on land use (household/employment), the existing and planned transportation network, and is based on the City's zoning and comprehensive plan.

## Where are the existing areas of concern?

The Consultant team asked the PAC and Cities for their thoughts on where they see hotspots in their transportation system.

- Safety issue in N. Bend - north bound lane? Sherman and Virginia - traveling east on Virginia and making a right turn
- New schools going in. Will need adequate pedestrian access
- Potential for safe routes to school
- Parking - downtown filling up
- Congestion on 10th street near school - people aren't taking bus
- Incentive money to ride public transit
- Want a taxi stand at the airport, and more transit
- Major development at mental health, health, but there's no bus stop near there
- Want a way to address facilities that are technically outside of jurisdiction coordinate with local partners
- Recommendations to redraw boundary lines?
- Head to east side: Bunker Hill
- US 101 speed variation
- Ocean Blvd - 4 lane to 2 lane slower speeds, now new development
- East Side Bridge with shared bike/vehicles - slower speeds
- Bunker Hill Bridge - Coos County owner jurisdiction


## Miscellaneous

- Derek has buildable land, zoning and potential development
- Planning commission meetings to affect schedule for DLCD notification
- Scoped to provide/identify ADA needs - we'll have it for state roads; Derek has it for N. Bend
- Identify where pavement is degraded and needs maintenance
- Ballot measure for transportation improvement - gas tax - it failed. Looking at franchise fees, URA tax, transportation utility fee
- Would like to see before and after traffic analysis on implemented changes on Ocean Blvd. Is it safer? Does it smooth out traffic? Yes, it is safer, but delay and congestion has increased in the past two years.
- Want more attention on Tech memos 1-3 at first PAC meeting - Consultant team suggested a quick survey to get priorities from PAC.
- Port of Coos Bay - got TIGER funding
- ODOT evaluated Bunker Hill


## Action Items and General Notes for Project Coordination:

- Send list of study intersections to PAC/City
- Wednesday afternoons for PMT meetings
- Comments from PAC will come through city staff
- Website should have a way to send a comment
- Invite planning commission and city council to open houses and to view website


## https://drive.google.com/open?id=1pPZQjvhJNPzXu8n8us5zDDJhzE4K3bEb\&usp=sharing

Analysis intersections. Developed during project development with ODOT, City of North Bend and City of Coos Bay staff. Traffic counts were collected during the summer of 2017.

## NORTH BEND

1. Arthur Street at Colorado Loop
2. Oak Street/W Airport Way at Colorado Avenue/Maple Leaf
3. Maple Leaf at E Airport Way
4. US 101 at Florida Avenue
5. Virginia Avenue at Arthur Street
6. Virginia Avenue at Oak Street
7. Virginia Avenue at Maple Street
8. Virginia Avenue at Broadway Street
9. Virginia Avenue at Pony Village Main Driveway
10. Virginia Avenue at Harrison Avenue
11. Virginia Avenue at Meade Avenue
12. Virginia Avenue at US 101 South
13. Virginia Avenue at US 101 North

## COOS BAY

1. Morrison Street at Lakeshore Drive
2. Newmark Avenue at Cape Arago Highway/Empire Boulevard
3. Newmark Avenue at Morrison Street
4. Newmark Avenue at Ocean Boulevard
5. Newmark Avenue at Laclair Street
6. Empire Boulevard at Pacific Avenue
7. Thompson Road at Woodland Drive
8. Koosbay Boulevard at Thompson Road
9. Ocean Boulevard at Woodland Drive
10. Ocean Boulevard at Butler Road
11. Koosbay Boulevard at 10th Street
12. Us 101 at Koosbay Blvd
13. 7th Street at Commercial Avenue
14. Commercial Avenue at US 101 South
15. Commercial Avenue at US 101 North
16. 10th Street at Central Avenue
17. Central Avenue at 7th Street
18. 7th Street at Anderson Avenue
19. Elrod Avenue at 10th Street
20. 11th Street at Ingersoll Avenue
21. 7th Street at Ingersoll Avenue
22. Marion Avenue at Safeway Driveway
23. Washington Avenue at US 101 South/Sherman Avenue
24. Pony Creek Road at Crowell Lane
25. Oak Street at 16th/17th Street
26. Broadway Street at 16 th Street
27. Broadway Avenue at 17th Street
28. US 101 at Mill Casino Entrance
29. Newmark Avenue at Oak Street
30. Broadway Street at Newmark Avenue
31. Newmark Street at Edgewood Drive
32. Newmark Avenue at Brusells Street
33. Newmark Street at Sherman Avenue
34. US 101 at Newmark Street
35. Hall Avenue at US 101 South
36. Hall Avenue at US 101 North
37. Johnson Avenue at US 101 South
38. Johnson Avenue at US 101 North
39. 7th Street at Lockhart Avenue/Southwest Boulevard
40. 6th Avenue at D street / Coos River Highway
41. Coos River Road at Ross Inlet Road

AGENDA

Coos Bay / North Bend<br>Transportation System Plan Updates<br>KICK-OFF MEETING<br>Coos Bay City Council Chambers

June 7, 2018
2:30 PM - 4:30 PM

| 2:30 PM - 2:45 PM | Introductions <br> Project Team <br> PAC | All |
| :--- | :--- | :--- |
| 2:45 PM - 3:15 PM | Background <br> TSP Purpose <br> Concurrent Updates <br> Typical TSP Elements | Consultant |
| 3:15 PM - 3:45 PM | Process/Schedule <br> Plan development <br> Review draft Schedule | Consultant |
| 3:45 PM - 4:00 PM | Public and Stakeholder Involvement | Consultant |
|  | Group Discussion <br> Where are existing areas of concern? <br> What do you hope the TSP Update will <br> accomplish? <br> (Safety, multi-modal connectivity, congestion, etc.) | All |

Overview
-Team Introduction
-Purpose of a TSP
-Common Elements
-TSP Development Process
-Roles and Responsibilities

- Group Input


TSP Background and Purpose

- Community's multi-modal blueprint for their transportation system
- Element of a local comprehensive plan
- Establishes a system of transportation facilities and services to meet state, regional, and local needs
- Sets priorities for available and anticipated funding in the planning period
-Walking and biking system improvements
- Consideration for tourism impacts (seasonal peaks)



## Concurrent Updates

- Last updated together in 2004
- Current updates are under a single contract
- Efficiencies in data collection and analysis
- Schedules linked
- PAC and public meetings
- Shared history and ongoing connection with unique character
- Project needs/desires
- Revenue
- Code and policy

Process will result in two separate TSPs


## Public and Stakeholder Involvement

- 3 Planning Advisory Committee (PAC) Meetings
- 2 Public Workshops
- Project Website
- Project documents, announcements, and ability to submit comments
- Planning Commission Presentations with City Staff
- City Council Presentations with City Staff



## Draft Schedule



## PAC Role and Responsibilities

## Role

- Provide technical review of key deliverables and analyses
- Guide development of policies
- Review and comment on draft plan and projects

Responsibilities

- Attend 3 PAC meetings
- Review information before meetings
- Express concerns and issues clearly and early on
- Consider issues with a broad perspective

PAC Meeting Topics

- Vision, Goals, and

Objectives

- Identifying system needs
- Developing solutions
- Prioritization/Evaluation of solutions
- Endorse the Plan


Common Transportation Terms

- Functional Classification - Explains how a particular roadway serves traffic
fenctional Casultations

- Vehicular mobility is
commonly measured by...
- Delay (Level of Service A - F)
- Percent of capacity: volume-tocapacity (v/c) ratio
- Bicycle and Pedestrian Level of Traffic Stress
- Measures effects of traffic stress on users
- Heavily influenced by traffic speeds ( $\leq 25 \mathrm{mph}$ © )


## $1>2>3>4$

- Travel Demand Model
- Land use (household / employment)
- Existing and planned network
- City's zoning and comp plan

| Where are the existing areas of concern? |  |
| :---: | :---: |
| Pedestrian <br> - Sidewalks \& Trails <br> - Out of direction travel? <br> - Safe crossings <br> - Access to parks, schools, shopping <br> Bicycle <br> - Bike parking <br> - Well defined routes <br> - Separate facilities? | Safety <br> - All modes <br> - Crash history/near misses <br> Vehicular <br> - Congestion/delay <br> - Future development <br> - Connectivity <br> Marine <br> - Industry access <br> - Recreation <br> Freight / Rail? |

AGENDA

Coos Bay / North Bend
Transportation System Plan Updates
PAC Meeting \#1
North Bend Public Library

December 12, 2018
2:00 PM - 4:00 PM

|  |  |  |
| :--- | :--- | :--- |
| 2:00 PM - 2:10 PM | Welcome \& Agenda Review <br> Review agenda <br> Meeting objectives | Angela Rogge <br> Brooke Jordan |
| 2:10 PM - 2:20 PM | Status Update <br> Work completed to date | Angela Rogge |
|  | Policy Background <br> Review goals, objectives, and evaluation criteria <br> Discussion | Brooke Jordan |
| 2:45 PM - 3:10 PM | Transportation Inventory \& Existing <br> Conditions <br> System inventory, conditions and existing <br> deficiencies <br> Discussion | Angela Rogge |
| 3:10 PM - 3:25 PM | Future Transportation Needs <br> Future deficiencies and needs <br> Funding forecast | Angela Rogge |
| 3:25-3:55 PM | Small Group Discussion |  |
| 3:55 PM - 4:00 PM | Next Steps | Angela Rogge |
| Brooke Jordan |  |  |

MEETING SUMMARY

Coos Bay / North Bend<br>Transportation System Plan Updates<br>Public Advisory Committee (PAC) Meeting \#1<br>North Bend Public Library

December 12, 2018

## Attendees:

Angela Rogge, David Evans and Associates, Inc. Brooke Jordan, Jacobs
Jim Hossley, City of Coos Bay
Chelsea Schnabel, City of North Bend
Derek Windham, City of North Bend
Virginia Elandt, ODOT
John Whitty, CTC

Rick Skinner, CTC/SCCS
Jamie Fereday, Citizen (Bicycle)
Jeff Stump, Confederated Tribes of Coos, Lower
Umpqua and Siuslaw
Sergio Gamino, Coos County Area Transit
Jenna Marmon, ODOT (Bike/Ped)
Jennifer Boardman, ODOT (Transit)

## Introductions/Background

The purpose of the meeting was share major findings from the technical work done to date related to existing and future conditions, and transportation system needs.

The PAC was asked to provide feedback on preliminary findings related to transportation system needs to support the ongoing development of the TSP update. Specifically, the PAC reviewed goals, objectives, and evaluation criteria, transportation inventory, existing conditions, and future transportation needs. Key points and feedback from the discussion with the PAC is summarized in the sections below.

## Goals

## General Comments

- Ensure we include tsunami/evacuation route in objectives (currently captured in Goal \#2 objectives)
- Goal \#2: Provide a transportation system that enhances the safety and security of all transportation modes.
- Unsure about "enhance"; acknowledge that the system is safe, and connect to resiliency
- Goal \#5: Provide a transportation system that supports existing industry and encourages economic development in the city.
- There was discussion on whether or not there was language that was not going to preclude future economic development. The objective that discusses facilitating development of desired land uses captures this concern.
- Goal \#7: Provide a sustainable transportation system through responsible stewardship of financial resources
- Consider adding practical design language to the objectives


## Specific Comments

## North Bend

- Goal \#1: How do we make what we have more resilient?
- Goal \#3/Criteria \#3: May need to move
- Goal \#5: Criteria \#1 seems a little disconnected from goal


## Coos Bay

- Goal \#5: Maintain what we've got
- Add language to address future economic development
- Need to take into account Coos Bay Village, existing and planned land use


## Transportation Inventory, Existing Conditions, Future Deficiencies and Needs

Angela walked through the work and data collection that was done in order to establish a baseline for the existing transportation system. Throughout the presentation, we paused to gather feedback/comments from the PAC.
PAC Feedback:

- Functional classification:
- Current classification of Arthur Street (collector) seems incorrect. Road serves residences on east side and is zoned for Airport on the west.
- Meade experiences a lot of cut-through traffic
- May want to include a map or table of the ADT estimates to confirm roadway functional classification
- Pedestrian/Bike
- $6^{\text {th }} /$ Coos River Highway/D St is a priority for improving pedestrian system
- Woodland Drive provides access to medical center
- There are no parallel facilities to Virginia Ave
- Areas with high pedestrian activity
- Virginia
- Empire/Morrison
- Newmark/Schoneman
- Devereux Center
- Newmark/Ocean
- Sherman
- Pedestrian LTS results: Revisit results at Ocean from Woodland to Central. Should be better than LTS 4.
- Consider restriping options for Sherman and Ocean to provide bicycle facilities
- Transit
- Concern with calling transit service "good" when the hours may not accommodate "shift workers"
- Identify potential partnerships with Tribes
- In order to increase funding opportunities, TSP should include language in the TSP for desired projects, recognizing that CCAT would take the lead on implementation/funding
- Regional transit hub
- Accessible transit
- Transit pull outs
- Vehicular
- Fix the existing system (potholes)
- Maintain and strengthen what we have
- Consider a traffic calming "toolbox" for the Cities to offer potential neighborhood treatments
- The PAC wants to be sure the TSP captures all of the needs, even if they are unlikely to be funded in the planning horizon.


## Priorities of the PAC

At the end of the meeting, we went around the room to identify what the PAC thinks should be priorities for the TSP. They are summarized below:

- Identify additional/new funding sources.
- Refine the broad priorities for the bicycle and pedestrian improvements to a targeted, prioritized list.
- Maintenance and improving resiliency of existing infrastructure.
- Develop a Safe Routes to School project list within a mile buffer of the schools.
- Post PAC follow-up: This information is not currently available through ODOT or existing data. The TSP may be able to identify projects that could be eligible for SRTS funding and include them in the final documentation, but if a robust and detailed SRTS is desired, it may need to be completed outside the scope of the TSP.
- Calm neighborhood traffic speeds.
- ADA (ODOT noted that all ODOT facilities are planned to have ADA improvements)
- Fix the potholes.
- Capture ALL the transportation needs somewhere in the TSP, even if they are unlikely to have funding.
- CCAT: Support Cities' priorities and collaborate on funding opportunities to improve transit
- Tribes: Support Cities' priorities and identify potential for teaming to capitalize on available funding


## Next Steps

The next phase of the project is to begin developing transportation alternatives to address identified deficiencies. The next PAC meeting is scheduled for early summer, but will likely be moved to early spring in order to engage the PAC in alternatives development.

Remember, all materials will be posted to the project website: http://www.bayareatsps.com

Overview
Agenda Review

## -Agenda and meeting objectives <br> -Project update <br> -Policy background <br> - Inventory and existing conditions <br> -Future needs and small group discussion <br> -Next steps

## Overview

Meeting Objectives
-Review and discuss key elements of work completed by project team
-Plan goals, objectives, and evaluation criteria
-Transportation system inventory and existing conditions
-Future transportation needs

## Policy Background

TSP Goals, Objectives, and Evaluation Criteria

## North Bend \& Coos Bay TSP Goals

- Goal \#1: Continue development of an interconnected, multimodal transportation network that connects all members of the community to destinations within and beyond the city.
- Goal \#2: Provide a transportation system that enhances the safety and security of all transportation modes.
- Goal \#3: Optimize the performance of the transportation system for the efficient movement of people and goods.
- Goal \#4: Provide an equitable, balanced and connected multi-modal transportation system.


## Policy Background

TSP Goals, Objectives, and Evaluation Criteria

## North Bend \& Coos Bay TSP Goals

- Goal \#5: Provide a transportation system that supports existing industry and encourages economic development in the city.
- Goal \#6: Develop and maintain a Transportation System Plan that is consistent with the goals and objectives of the city, Coos County, and the state.
- Goal \#7: Provide a sustainable transportation system through responsible stewardship of financial resources.
- Goal \#8: Provide a transportation system that enhances the health of residents and users and that minimizes impacts to the environment.

Policy Background
TSP Goals, Objectives, and Evaluation Criteria

| Goal | Evaluation Criteria |
| :---: | :---: |
| \#1 | Improves or creates access to community destinations Improves facilities for those using mobility devices Enhances the active transportation or transit network |
| \#2 | Improves transportation safety (crossings, intersections, visibility, all modes) Enhances emergency preparedness/community resiliency |
| \#3 | Addresses known access issues on state highways or major arteria Reduces reliance on highway system for shorter, local trips Improves efficiency of transportation system |
| \#4 | Enhances public transportation services (e.g., new routes, shelters) Improves bicycle and pedestrian connections to public transportation stops Enhances transportation options to underserved areas |
| \#5 | Preserves or maintains existing transportation facilities Minimizes negative impacts to existing land use Improves or maintains freight access/connectivity |
| \#6 | Is consistent with local, state, and federal plans and policies Supports the City's land use vision |
| \#7 | Alternative measure to increasing capacity Provides significant increase in mobility/accessibility Preserves existing systems |
| \#8 | Increases active transportation options Minimizes impacts to natural resources |



## Discussion

-Is there anything missing?
-Do the objectives support the goals?
-Do they evaluation criteria make sense to you?

## Transportation Inventory \& Existing Conditions North Bend \& Coos Bay Street System

Coos Bay and North Bend have 5 roadway classifications within their Transportation Systems:

- Principle Arterials: Freeways and state highways
- Arterials: Interconnect and support principle arterials
- Collectors: Provide access and circulation within residential and commercial/industrial areas
- Neighborhood Routes (Coos Bay): Longer local streets that provide connectivity to collectors or arterials
- Local Streets: Provide access to immediate adjacent land

Transportation Inventory \& Existing Conditions North Bend \& Coos Bay Street System

North Bend \& Coos Bay Primary Truck Freight Routes

- US 101 (North Bend and

Coos Bay)

- North Bend:
- OR 540 - Cape Arago Hwy
- Coos Bay:
- Newmark Ave
- Empire Blva
- Ocean Blvd


Transportation Inventory \& Existing Conditions
North Bend \& Coos Bay Street System
Roadway Design and Geometry

- Railroad Crossings: 15 atgrade crossings in Coos Bay and North Bend
- Pavement Conditions:
- North Bend rated 'good'
- Coos Bay rated 'fair'
- On Street Parking: Widely available in both cities, and most utilized in downtown areas on US 101


Transportation Inventory \& Existing Conditions Coos Bay Pedestrian Network

Sidewalk Inventory

| Roadway Name | Classification | Existing Sidewalks |
| :---: | :---: | :---: |
| US 101 | Principal Arterial | No |
| S Front St | Principal Arterial | No |
| S Empire Blvd | Arterial | Yes |
| Newmark Ave | Arterial | Yes |
| Ocean Blvd | Arterial | Yes |
| Woodland Dr | Arterial | No |
| Coos River Hwy | Arterial | No |
| 6th Ave | Arterial | No |
| Southwest Blvd | Arterial | Yes |
| Lockhart Ave | Arterial | No |
| Koosbay Blvd | Arterial | Varies |
| N 7th St | Arterial | Varies |
| N 10th St | Arterial | Yes |

## Transportation Inventory \& Existing Conditions

 Coos Bay Pedestrian NetworkTransportation Inventory \& Existing Conditions North Bend Pedestrian Network

- The majority of North Bend's street system has sidewalks
- A need for sidewalks exists on 6 collector streets:
- $17^{\text {th }}$ Street
- Arthur Street
- Colorado Ave
- Crowell Lane
- Lakeshore Drive
- Oak Street


Sidewalk Inventory


## Transportation Inventory \& Existing Conditions

 Coos Bay \& North Bend Pedestrian NetworkHighest Pedestrian Volumes at Study Intersections

## North Bend:

- Virginia Ave between Broadway Ave and US 101


## Coos Bay:

- US 101 at Johnson Ave and at Commercial Ave
- 7th Street and Anderson Ave

Transportation Inventory \& Existing Conditions Coos Bay \& North Bend Pedestrian Network

## Pedestrian Level of Traffic Stress



- No PLTS 1 facilities in North Bend or Coos Bay
- Many arterial and collector streets have speeds greater than 25 mph or limited sidewalk buffers.
- Many PLTS 4 facilities are due to 2 categories:
- There is no sidewalk
- There is a sidewalk, but the sidewalk has little or no buffer from traffic



## Transportation Inventory \& Existing Conditions

 North Bend Bicycle Network- Limited bicycle facilities, and minor improvements since 2004 TSP.
- Existing bicycle network overlaps with Oregon Coast Bike Route (OCBR) that runs from Astoria to Brookings.
- Current standards require minimum 5-6 foot bike lane on arterial and collector streets.

| Roasway Name | Classitication | $\begin{aligned} & \text { Existing Bike } \\ & \text { Facility } \end{aligned}$ | Planned Bike |
| :---: | :---: | :---: | :---: |
| US 101 | Principal Arterial | Yes ${ }^{\text {², }}$ | Yes |
| Virginia Ave | Minor Arterial/Urban Collector | Yes ${ }^{1}$ | Yes |
| Broadway Ave | Minor Atterial | Yes ${ }^{1}$ | Yes |
| Sherman Ave | Minor Arterial | No | Yes |
| Newmark st | Minor Arterial | Yes ${ }^{1}$ | Yes |
| $16^{\text {th }}$ st | Urban Collector | No | Yes |
| $17^{7{ }^{\text {tht }} \text { st }}$ | Urban Collector | No | Yes |
| Arthur 5 t | Urban Collector | No | Yes |
| Colorado Ave | Urban Collector | No | Yes |
| Connecticut Ave | Urban Collector | No | Yes |
| Crowell Lane | Urban Collector | No | Yes |
| Harison Ave | Urban Collector | No | No |
| Lakeshore Dr | Urban Collector | No | Yes |
| Maple Leaf St | Urban Collector | No | No |
| Maple st | Urban Collector | No | Yes |
| Oakst | Urban Collector | No | Yes |
| Pacific 5 t | Urban Collector | No | Yes |
| Pony Creek st | Urban Collector | No | Yes |
| Thompson Ave | Urban Collector | No | Yes |

## Transportation Inventory \& Existing Conditions Coos Bay \& North Bend Bicycle Network

Highest Bicycle Volumes at Study Intersections
North Bend

- Bicycle volumes range between 0 and 5 during peak hour
- Most of the volumes were recorded crossing Virginia Avenue between Broadway Street at US 101
- Coos Bay
- Bicycle volumes range between 0 and 5 during peak hour
- Highest Volume Intersections
- Newmark Avenue at Ocean Boulevard
- US 101 at Koosbay Boulevard
- Elrod Avenue at 10 ${ }^{\text {th }}$ Street

Transportation Inventory \& Existing Conditions Coos Bay \& North Bend Bicycle Network

Bicycle Level of Traffic Stress


- The project team evaluated most of the roadway network for bicycle feasibility in the Cities using the Urban/Suburban Mixed Traffic LTS Criteria.

| Urban/Suburban Mixed Traffic BLTS Criteria |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Prevailing <br> Speed or Speed <br> Limit (mph) | Unmarked <br> Centerline | 1 lane per <br> Direction | 2 lanes per <br> direction | 3+ lanes per <br> direction |
| <25 | BLTS 1 | BLTS 2 | BLTS 3 | BLTS 4 |
| B0 | BLTS 2 | BLTS 3 | BLTS 4 | BLTS 4 |
| $>35$ | BLTS 3 | BLTS 4 | BLTS 4 | BLTS 4 |

Transportation Inventory \& Existing Conditions
Coos Bay \& North Bend Bicycle Network

Bicycle Level of Traffic Stress
Ubian Growth Boundary (USB
Bicycle Level of Tratfic Stress

$$
\text { - BLTS } 1
$$





## Transportation Inventory \& Existing Conditions

Coos Bay \& North Bend Transit Network

## Transit Qualitative Assessment

- A Qualitative Multimodal Assessment (QMA) methodology to provide a context-based rating.
- Frequency and on-time reliability
- Schedule speed/travel times
- Transit stop amenities
- Connecting pedestrian/bike network
- The QMA for both cities rates as 'Good' for a majority of the Bay Area Loop and 'Fair' for only a few segments.

Transportation Inventory \& Existing Conditions Coos Bay \& North Bend Transit Network

Transit Qualitative
Multimodal
Assessment


Transportation Inventory \& Existing Conditions Study Area Crashes

## Study Area

 Crashes


## Transportation Inventory \& Existing Conditions

 Safety Evaluation
## North Bend:

- Virginia Avenue at US 101 South
- Washington Avenue at US 101 South/Sherman Avenue
- Pony Creek Road at Crowell Lane
Broadway Street at Newmark Avenue
- US 101 at Newmark Street

Coos Bay:
-Thompson Avenue at Woodland Drive

- Koosbay Boulevard at 10th Street
- 7th Street at Ingersoll Avenue
- Johnson Avenue at US 101


## North

- 6th Avenue at D Street / Coos River Highway


## Transportation Inventory \& Existing Conditions Safety Evaluation

Pedestrian Crash Trends (2012-2016)

- 36 crashes involving pedestrian documented in study area.
- Most common reason for crash, vehicle not yielding.
- Most crashes occur in commercial or downtown areas.
- North Bend
- 21 documented crashes involving pedestrians, resulting in 2 fatalities.
- Coos Bay
- 15 documented crashes involving pedestrians, resulting in 1 fatality.



## Transportation Inventory \& Existing Conditions Safety Evaluation

Bicycle Crash Trends (2012-2016)

- 36 crashes involving bicyclists documented in study area.
- North Bend
- 18 documented pedestrian involved crashes, resulting in 0 fatalities.
- High incidence of bicycle crashes around Broadway Avenue and Newmark Avenue.
- Coos Bay
- 18 documented pedestrian involved crashes, resulting 0 fatalities.
- High incidence of bicycle crashes in downtown, around Central Avenue.


## Future Deficiencies and Needs

## Pedestrian System

## Pedestrian

- Deficiencies: Certain streets do not have adequate pedestrian facilities or connectivity options for pedestrians.
- Need: Expand the City's system of pedestrian facilities, with the objective of sidewalks or pedestrian pathways on all collectors and arterial streets.


Future Deficiencies and Needs
Pedestrian System

## Coos Bay

- Priority: facilities that provide access to key community destinations.

Future Deficiencies and Needs

## Coos Bay

- Secondary: facilitates that provide less direct access to key community destinations and/or provide north-south and east-west routes where there is a gap in coverage.


## Pedestrian System

| Facility Name | Approximate Location |
| :---: | :---: |
|  | Secondary |
| Colorado Ave (one side) | Oak St to Maple St |
| Oak St | 17th St to Colorado Ave |
| 17th St | Broadway St to Myrtle St |
| Arthur St (one side) | Connecticut Ave to Virginia Ave |
| Virginia Ave (one side) | Crocker St to Arthur St |

## Future Deficiencies and Needs

Pedestrian System
North Bend

- Secondary: facilitates that provide less direct access to key community destinations and/or provide north-south and east-west routes where there is a gap in coverage.


## Future Deficiencies and Needs

Bicycle System

## Bicycle

- Deficiencies: Existing bicycle transportation network include few dedicated bicycle facilities, with minimal signage and markings throughout the street system.
- Need: Develop bicycle facilities that connect key community destinations and activity centers

Future Deficiencies and Needs
Bicycle System
North Bend

- Priority: facilities that provide access to key community destinations.
- Secondary: facilitates that provide less direct access to key community destinations and/or provide north-south and east-west routes where there is a gap in coverage.



## Bicycle Deficiencies and Needs

Bicycle System

Coos Bay

- Secondary: facilitates that provide less direct access to key community
destinations and/or provide north-south and east-west routes where there is a gap in coverage.



## Future Deficiencies and Needs

Transit System

## Transit

- Coos County Area Transit (CCAT) provides good level of transit service in the area.
- As population growth occurs, transit deficiencies and needs are focused on enhancing existing service coverage and frequency, ensuring transit accessibility, and continuing coordination between CCAT and intercity transportation providers as their services evolve.

Future Deficiencies and Needs
Transit System

| Route | Category of Need | Description |
| :---: | :---: | :---: |
| N/A | Service Frequency | Consider supplementing existing transit service between Bandon and North Bend/Coos Bay which are currently served by the Coastal Express route operated by Curry Public Transit |
| N/A | Service Frequency | Consider expanding dial-a-ride/demand response service to provide transportation options for seniors and mobility-limited residents to medical appointments and key community destinations. |
| N/A | Inter-Agency Coordination | Coordinate with Curry Public Transit, Pacific Crest, and other inter-city transportation providers to ensure ongoing alignment with CCAT schedules and stop locations in North Bend and Coos Bay. |
| N/A | Accessibility | Consider providing additional transit shelters at stops with higher ridership and near key community destinations. |
| N/A | Accessibility | Work with the Cities of North Bend and Coos Bay to guide strategic investments for improving access to bus stops. |

## Discussion

- Did we capture all the deficiencies and needs?
- Is there anything missing?


## Funding Forecast

## Federal Funding

- Federal Highway Trust Fund: Sourced by Federal gas tax (\$. 184 per gallon) and is distributed through Oregon's Surface Transportation Block Grant (STBG) program.
- Surface Transportation Program (STP) Funds: Flexible transportation funds, administered through ODOT.
- Federal Enhancement Funds and Other Grants: Funds from Federal programs that can be used for capital improvements, multimodal projects, safety, and historic preservation projects.


## Funding Forecast

## State Funding

- State Highway Fund: Comprised of motor vehicle taxes, drivers license fees, motor vehicle registration and title fees, and weight-mile tax.
- Coos Bay: \$1.05 million FY18
- North Bend: \$600,000 FY18
- State Transportation Grants: Competitive grants for a broad range of transportation activities, i.e. Safe Routes to School, Immediate Opportunity Fund, Oregon Parks and Rec Fund.
- Transportation Growth Management (TGM) Grant:

Competitive funds to be used for studies related to managing growth and reducing single-occupant vehicle (SOV) travel.

## Funding Forecast

Local Funding

- Franchise Fees: Fees collected from public utility and service providers that use public right-of-way.
- Coos Bay: \$2.1 million FY17
- North Bend: \$1.2 million FY17
- Local Improvement Districts (LIDs): Neighboring property owners working together to improve public facilities by paying over time through individual assessments.
- Often used to complete local streets, sidewalks, business district improvements.


## Funding Forecast - Coos Bay

## Key Findings:

- Two primary revenue sources: State Highway Fund and PacifiCorp franchise fees.
- In FY17, Coos Bay received approximately \$990,000 in State Highway Fund distributions and allocated \$350,000 in collected franchise fees for street maintenance and improvements.
- Transportation revenues have not kept pace with operations, maintenance, and construction costs.
- $\$ 20$ million dollars needed to bring City streets up to "good."
- Passage of HB17 will increase Coos Bay's State Highway Fund to more than $\$ 1.2$ million in FY19.


## Funding Forecast

## Local Funding

- Local Fuel Tax: $\$ .01$ to $\$ .10$ cents per gallon tax paid by the fuel distributors, to be used on local street and transportation maintenance.
- In 2016 Coos Bay and North Bend defeated a local fuel tax measure.
- Transportation System Development Charges (SDCs): Fees collected from developers as new development occurs that will impact the transportation network.
- Coos Bay and North Bend currently do not levy transportation SDCs.


## Funding Forecast - North Bend

## Key Findings:

- State Highway Fund primary revenue source.
- In FY18, North Bend received approximately $\$ 620,000$ in State Highway Fund distributions
- Transportation revenues have not kept pace with operations, maintenance, and construction costs.
- $\$ 16.5$ million dollars needed to bring City streets up to "very good."
- Passage of HB17 will increase North Bend's State Highway Fund to more than \$700,000 in FY19.


## Small Group Discussion

- Break into two discussion groups: one for North Bend and one for Coos Bay
- Which needs should be prioritized given the goals and objectives of the TSPs and constrained funding levels? ( 20 mins )
- Report back (10 mins)


## You're Invited!

Attend the North Bend and Coos Bay Transportation System Plan (TSP) Updates Open House to learn about the plans, ask questions, and talk with staff. Light snacks will be provided.

## Open House \#1

5:00-7:00 p.m., Wednesday, December 12
North Bend Public Library 1800 Sherman Ave., North Bend, OR

Representatives from the Cities of North Bend and Coos Bay will be available to share project updates and answer questions. Help shape the future transportation systems of North Bend and Coos Bay.

> 5:00 - 5:30 p.m. Staff presentation 5:30-7:00 p.m. Open workshop

## About the TSPs

North Bend and Coos Bay's respective Transportation System Plans (TSPs) consider the needs of those travelling by foot, bike, car, and bus, as well as trucks, trains, and airplanes.

On Wednesday, December 12, the Cities of North Bend and Coos Bay will host an open house to gather feedback on the update to their TSPs. Your participation is essential to creating a plan that benefits all residents and visitors.

At the open house, you can:

- Learn about transportation issues
- Ask questions of the project team
- Provide feedback on TSP goals, transportation issues, and opportunities



## ¡Está Invitado!

Asista a la reunión abierta para recibir Información actualizada sobre el Plan del Sistema de Transporte (TSP siglas en inglés) para North Bend y Coos Bay y conocer los planes, hacer preguntas y hablar con el personal. Se proporcionarán refrigerios ligeros.

## Reunión Abierta \#1

5:00-7:00 p.m., Miércoles Diciembre 12 Biblioteca Pública North Bend 1800 Sherman Ave., North Bend, OR

Representantes de las ciudades de North Bend y Coos Bay estarán disponibles para compartir información actualizada del proyecto y para contestar preguntas. Ayude a diseñar los sistemas futuros de transporte de North Bend y Coos Bay.

5:00-5:30 p.m. Presentación del Personal 5:30-7:00 p.m. Taller

## Acerca de TSPs

Los planes del Sistema de Transporte (TSPs) de North Bend y Coos Bay respectivamente, toman en consideración las necesidades de aquellos que viajan a pie, en bicicleta, en automóvil y en autobús, así como en camiones, trenes y aviones.
El Miércoles 12 de Diciembre, las ciudades de North Bend y Coos Bay, tendrán una reunión abierta para recabar comentarios sobre la actualización de sus TSPs. Su participación es esencial para crear un plan que beneficie a todos los residentes y a los visitantes.
En la recepción abierta usted puede:

- Enterarse acerca de los problemas de transporte
- Hacerle preguntas al equipo del proyecto
- Proporcionar sus comentarios sobre las metas TPS, los problemas de transporte y las oportunidades.

Can't make the open house?
Participate online!

You can still learn about the plan and provide feedback even if you can't attend the open house. Visit
www.bayareatsps.com for more information.
¿No puede asistir a la reunión?
Participe en línea!

Usted puede enterarse del plan y proporcionar sus comentarios, aun si no asiste a la reunión. Para más información visite
www.bayareatsps.com


Open House \#1
December 12, 2018 5:00 PM - 7:00 PM


Transportation System Plan 101 Introduction

- Community's multi-modal blueprint for their transportation system

Element of a local comprehensive plan

- Establishes a system of transportation facilities and services to meet state, regional, and local needs
- Sets priorities for available and anticipated funding in the planning period
- Consideration for tourism impacts (seasonal peaks)



## TSP Updates <br> Introduction

- North Bend and Coos Bay TSPs were last updated in 2004
- Current update process is being conducted together to reflect the communities' shared history and ongoing connections
- TSP updates will reflect the communities' vision and priorities for the transportation system over the next 20 years

[^1]

## Project Background <br> TSP Goals

- Eight goals have been developed to reflect North Bend and Coos Bay's visions for the TSP update
- Includes goals about:
- Safety and security for all transportation modes
- Responsible stewardship of financial resources
- Support for existing industry and encouragement of economic development
- Health of residents and users and impacts to the environment


## Project Background

## North Bend \& Coos Bay Street System

Coos Bay and North Bend have 5 roadway classifications within their Transportation Systems:

- Principal Arterials: Freeways and state highways
- Arterials: Interconnect and support principle arterials
- Collectors: Provide access and circulation within residential and commercial/industrial areas
- Neighborhood Routes (Coos Bay): Longer local streets that provide connectivity to collectors or arterials
- Local Streets: Provide access to immediate adjacent land

Project Background
Transportation Inventory
TSP update focuses on arterial and collector street intersections.

- North Bend - 26 study intersections.
- Coos Bay - 28 study intersections.



## Project Background

Traffic Operations

## - North Bend

- Limited east-west connectivity between Broadway Avenue and Sherman Avenue
- Local cut-through traffic use Meade instead of US 101 to access Virginia Ave
- Coos Bay
- The Bunker Hill area and Newport Lane/Slough bridge are the only connection to east Coos Bay
- Intersections where drivers experience delays during the PM Peak Hour include:
- Broadway St at Newmark Ave
- $7^{\text {th }}$ St at Anderson Ave
- Hall Ave at US 101 North
- Johnson Ave at US 101 South



## Project Background

Future Deficiencies and Needs

## Future Population

- Coos Bay and North Bend will see minor, but steady population growth by 2040.
- Coos Bay: 1,026 increase
- North Bend: 650 increase
- To predict future vehicular traffic volumes and impacts due to population growth, project team will use the Coos Bay/North Bend Travel Demand Model.


## Project Background

Traffic Operations - Deficiencies and Needs

- Similar to existing conditions
- Growth in traffic could increase congestion, specifically along US 101 and Newmark
- Two study area intersections expected to exceed mobility targets in the future:
- US 101 at Newmark St
- Newmark Ave at Morrison St - side street delays


## Project Background

Pedestrian System - Deficiencies and Needs

## Pedestrian

- Deficiencies: Certain streets do not have adequate pedestrian facilities or connectivity options for pedestrians.
- Need: Expand the City's system of pedestrian facilities, with the objective of sidewalks or pedestrian pathways on all collectors and arterial streets.


## Project Background

Bicycle System - Deficiencies and Needs

## Bicycle

- Deficiencies: Existing bicycle transportation network include few dedicated bicycle facilities, with minimal signage and markings throughout the street system.
- Need: Develop bicycle facilities that connect key community destinations and activity centers



## Existing Conditions and Needs Workshop

## Station 1:

- Discuss the TSP updates with project staff and learn more about the work to date


## Station 2:

- Identify transportation needs and issues on a map
- Indicate the most important needs to address

Additional project info at bayareatsps.com


## Attendees:

Angela Rogge, David Evans and Associates, Inc. (Consultant Project Manager)
Brooke Jordan, Jacobs (Consultant) Jim Hossley, City of Coos Bay Derek Windham, City of North Bend Jeff Stump, Confederated Tribes of Coos, Lower Umpqua and Siuslaw

Diana Schab, North Bend Planning Commission
Randy Dixon, City of Coos Bay
Dick Leshley, Chamber Transportation
Committee/Yellow Cab
Jenna Marmon, ODOT
Matt Jensen, Coquille Indian Tribe
John Whitty, Coos Bay

## Introductions/Background

Angela, Consultant Project Manager, began the meeting with a round of self-introductions of Public Advisory Committee (PAC) members. Angela reviewed the meeting agenda and objectives. The primary objective of the second PAC meeting is to review and solicit feedback on all draft alternatives. Feedback from the PAC will help prioritize projects and comments will be incorporated into the Preferred Alternatives Memo (TM \#9).

## Process/Schedule

The project is in the development of alternatives phase and we are a little over half-way through the project. In the coming months, the project team will work on the following tasks:

- Draft Preferred Alternatives Selection Technical Memorandum (TM \#9) incorporating PAC feedback
- Draft Transportation Improvement Finance Programs (TM \#10)
- Draft Policies and Standards Memorandums (TM \#11)
- Draft Code Provisions \& Ordinance Amendments Memorandums (TM \#12)
- Draft TSPs
- TSP Adoption


## PAC \#2 Feedback and Participation

Overall, PAC members emphasized a need for road maintenance in the form of pothole repair, improvement to the City-wide pedestrian and bicycle network for both communities, and a strong desire to link improvements with tourism and community amenities. Below is a compiled list of comments received for both North Bend and Coos Bay on various alternatives presented in TM \#8. Projects without additional comments are listed to emphasize the PAC's interest in them being considered. Attendees
were also asked to vote for projects by placing dot stickers on a large printed project list. The votes will help the project team understand which projects are most important to PAC members. A total of approximately 135 votes were tallied.

## North Bend Flip Chart Notes:

- North Bend Priorities
- Pedestrian improvements (Newmark Ave/St, connecting the boardwalk) are important. Community members desire a more comfortable environment rather than a busy traffic roadway.
- Community desire to build upon the Boardwalk by improving waterfront access and promoting a more active pedestrian space.
- Prioritize projects with multimodal benefits, city-wide:
- Citywide trails, wayfinding signage with walk times to highlight trails, recreation, and other attractions.
- Maintenance is a key priority as congestion increases, as well as transit investments and ITS strategies to improve traffic flow.
- Interest in considering an app or coordination effort with the tourism office to manage parking for visitors.
- Pedestrian and bicycle connectivity is important to the community - and individuals' health and willingness to choose active transportation options.
- Consider pedestrian crossing improvements on US 101 between Florida and the bridge to reduce pedestrian/driver conflicts.


## Draft Alternatives:

- North Bend Pedestrian Projects
- Newmark Ave by Bi-Mart - from west side of city limits to Broadway Ave
- Would like to consolidate access/driveways
- It can be difficult to turn out of shopping center onto Broadway
- NB-19: Pedestrian crossing at US 101 north of Florida Ave
- Locate at visitor center
- Connect to Simpson Park
- NB-20: Connect Boardwalks
- Community supports this project but there likely needs to be private funding
- Consider adding a pedestrian project along Broadway between Virginia and Newmark (currently a bicycle project).


## - North Bend Bicycle Projects

- NB-26: Newmark Bicycle Facility
- Consider narrowing travel lanes and widening sidewalks where parallel route is challenging - on Virginia, Broadway, and Newmark.
- NB-28: Oregon Coast Bike Route
- Keep main system the same and considering adding "scenic" or "supply" alternatives on US 101
- Looking at a campaign targeted at bikers/drivers to get them into cities/downtowns.
- North Bend Transit Projects
- Extend service hours for transit
- North Bend Safety Projects
- NB-34: Virginia Ave/Meade Ave traffic calming
- Not willing to implement turn restrictions here yet
- Intent is to cut back on the cut-through traffic
- NB-38: Washington Ave/US 101 Pedestrian Crossing Enhancements
- Not enough ROW for median
- New/enhanced signage most likely option
- NB-27: Newmark St Lane Reconfiguration (add bicycle facilities)
- North Bend Roadway Projects
- NB-45: Extending local street connectivity across Pony Creek Estuary -- Not feasible
- NB-46: Pavement Maintenance
- Add more specific language to address potholes
- Explain cause of potholes/importance of maintenance
- This is critical. City will have a hard time justifying other projects to public until this is addressed.
- Include CCAT's transit master plan and new pedestrian crossing at Broadway Ave/ Maine Ave


## Coos Bay Flip Chart Notes:

- Coos Bay Priorities
- All projects for Coos Bay are worthwhile in the opinion of PAC members.
- Maintenance and repair of the street pavement and transportation network is a key priority among Coos Bay members.
- Transit is important - service, shelters, transit hub.
- Pedestrian projects around the hospital and on Woodland are of interest to the community.
- There is a desire to increase access to North Bend Medical Center because access options are not widely known by public.
- Consider improving pedestrian safety and access with RRFB/pedestrian activated crossings and additional lighting at crossings/intersections.
- The community is generally pleased with City of Coos Bay's effort on Empire Blvd, Newmark Ave, and Ocean Blvd - repaving, sidewalks, drainage, gutter.
- Support what the City of Coos Bay is interested in prioritizing.
- Consider innovation for wayfinding.
- There is a desire to develop more multimodal projects throughout the City and connect the Boardwalk with another trail
- Concentrate on connection between transportation and economic development


## Draft Alternatives:

- Coos Bay Pedestrian Projects
- CB-11: Koosbay Blvd Traffic Calming
- Low priority for City to improve Koosbay Blvd
- Providing a parallel route via $14^{\text {th }}$ may be a more appropriate option to provide bicycle facilities
- Wayfinding should be included on trails and other informative material
- Partner with Parks and Recreation, Travel Oregon, and other groups
- Prioritize CB-16 Hospital Way sidewalk
- Consider adding a crossing a Curtis Ave and US 101
- Railroad crossings present some crossing challenges - some locations are private, but some are public.
- CB-29: US 101 Southern Bicycle lanes:
- What is the timeline for the Slough Bridge for ODOT? Connectivity across the bridge?
- The Oregon Coast Bike Route project is looking at barriers and the McCollough Bridge is one
- Newport Ln/Isthmus Slough Bridge:
- Include language about widening specifically to include bicycles and pedestrians
- Look at Hall Ave as safety concern for bike/ped/vehicle interactions


## - Coos Bay Transit Projects

- Bus pull outs
- Would likely require removing parking or additional right-of-way


## - Coos Bay Safety Projects

- CB-38: Ocean Blvd/19 ${ }^{\text {th }}$ St Access Management
- Improve channelization
- CB-39: Thompson Ave/Woodland Dr Safety Enhancements
- Could be related to sight distance. When in westbound right-turn lane, drivers can't see well.
- Project could be as simple as removing the westbound right-turn bay and making the movement a shared thru/right.


## - Coos Bay Roadway Projects

- CB-46: Newmark Ave/Ocean Blvd Realignment
- Could start by shortening up pedestrian crossing distance
- CB-51: S Front St Street Upgrade
- Upgrade to facilitate connections. Currently classified as an arterials but is a gravel road near US 101.
- CB-52: Pavement Maintenance
- Add more specific language to address potholes
- Explain cause of potholes/importance of maintenance
- This is critical. City will have a hard time justifying other projects to public until this is addressed.
- CB-53: Newport Ln/Isthmus Slough Bridge Widening
- Include note that this would be to accommodate bicycles and pedestrians.


## North Bend Draft Alternatives Project List

Alternatives that impact and improve pedestrian, bicycle, transit, and safety received the most votes from PAC members. Projects that received the most votes included building out a pedestrian oriented environment, improving conditions for cyclists, expanding transit service, maintaining the current roadway network, and ensuring the system is safe for all road users.

In North Bend, connecting the boardwalks to create an uninterrupted five-mile boardwalk was voted as the most important pedestrian project. Among bicycle projects, people thought that providing bicycle facilities along Broadway Ave was most important, while adding additional transit service, extending service hours, and adding shelters and stops near community destinations were all identified equally as top priority transit projects.

Improving transportation safety by repaving and restriping along Newmark St is of top priority among safety projects, while maintaining/fixing/strengthening the existing pavement system was selected as the most important roadway project.

Recognizing freight as an important element within the City's transportation system, PAC participants indicated that making modifications to accommodate high heavy vehicle volumes along US 101 and Florida Ave is the most important rail/truck freight project. Lastly, direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland) was voted as the most important project among the marine/airport projects.

| ID | Location | Description | PAC <br> Votes |
| :---: | :---: | :---: | :---: |
|  | PEDESTRIAN |  |  |
| NB-9 | Sheridan Ave: Florida Ave to Bayview Ave | Add sidewalk on Sheridan Ave and upgrade RR crossing to connect Simpson Heights to downtown |  |
| NB-10 | $16^{\text {th }} \mathrm{St} / 17^{\text {th }}$ : Broadway Ave to Oak St | Add sidewalk to provide connectivity to schools east of Broadway Ave via $16^{\text {th }}$ St |  |
| NB-11 | Oak St: Colorado Ave to Newmark Ave | Establish Neighborhood Greenway (traffic calming measures and wayfinding) to improve pedestrian environment |  |
| NB-12 | Pacific St: Crowell Ln to $16^{\text {th }} \mathrm{St}$ | Sidewalk on west side and enhanced crossings (visibility) | 2 |
| NB-13 | Virginia Ave: US 101 to Broadway Ave | Identify opportunities for access consolidation (with redevelopment/change of use); traffic calming (landscaping, street furniture) |  |
| NB-14 | Newmark Ave: <br> Broadway Ave to West City Limits | Access consolidation and medians | 2 |
| NB-15 | Newmark St: US 101 to Sherman Ave | Half street improvement Sherman Ave to US 101 to provide bicycle and pedestrian facilities | 3 |
| NB-16 | North Bend Senior Center | Marked crossing of Colorado Avenue and sidewalks from transit stop to Activity Center |  |
| NB-17 | Boynton Park | Marked crossing of Sherman Avenue at Exchange Street transit stop | 1 |
| NB-18 | Airport Heights Market | Improve crossing for pedestrians | 1 |
| NB-19 | US 101 north of Florida Ave | Identify preferred location for pedestrian crossing of US 101 | 2 |


| ID | Location | Description | PAC <br> Votes |
| :---: | :---: | :---: | :---: |
| NB-20 | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five-mile uninterrupted boardwalk. | 4 |
| BICYCLE |  |  |  |
| NB-21 | City Wide | Create a Bicycle Transportation Plan that connects Arterials, Collectors (neighborhood calming, parallel routes, signing, formal striping) | 2 |
| NB-22 | Broadway Ave (Cape Arago Hwy) | Provide bicycle facilities through coordination with the OCBR (Priority Virginia Ave to $16^{\text {th }}$ St) | 3 |
| NB-23 | Maple Leaf/Colorado | Stripe bicycle facilities (with repaving project) | 1 |
| NB-24 | Sheridan Ave: Florida Ave to Bayview Ave | Provide bicycle facilities through signing/striping | 2 |
| NB-25 | City Wide | Establish Neighborhood Greenway (traffic calming measures and wayfinding): Harrison, Pony Creek, Crowell, $16^{\text {th }}$, Myrtle, $17^{\text {th }}$, Oak, Lakeshore, Virginia Ave | 1 |
| NB-26 | Newmark Ave: <br> Broadway Ave to West City Limits | Provide bicycle facilities (OCBR) through lane diet or parallel routes/wayfinding. Parallel route options: Oak St, $16^{\text {th }} / 17^{\text {th }}$, Myrtle St, Commercial St. | 2 |
| NB-27 | Newmark St: Sherman Ave to Broadway Ave | Provide bicycle facilities restriping (with repaving project) | 1 |
| NB-28 | US 101 | Provide bicycle facilities (OCBR priority) through parallel routes | 1 |
| TRANSIT |  |  |  |
| NB-29 | Bay Area Loop | Add weekend service | 2 |
| NB-30 | All Transit Routes | Extend service hours | 2 |
| NB-31 | US 101 \& Sherman Ave | Increase frequency \& add additional route | 2 |
| NB-32 | All Transit Routes | Add shelters and stops near community destinations | 2 |
| NB-33 | All Transit Routes | Improve bicycle and ped connectivity to stops | 1 |
| SAFETY CONCERN |  |  |  |
| NB-34 | Virginia Ave at Meade Ave | Traffic calming along Meade and Connecticut: Narrow up street feeling (bulb outs, speed humps, formalize on street parking) -Mimic aspects of Downtown Streetscape. | 1 |
| NB-35 | Newmark Ave at Oak St | Enhance visibility of signal and pavement paint/crossings -recent improvements may improve conditions. |  |
| NB-36 | US 101 at Florida Ave | Monitor crash history in future -- recent improvements may improve conditions. | 1 |
| NB-37 | US 101 South at Virginia Ave | Monitor crash history in future -- recent improvements may improve conditions. |  |
| NB-38 | Washington Ave at US 101 South/Sherman Ave | Explore options to provide safer pedestrian crossing of highway (curb bulb outs, RRFB, median refuge, lighting, signage). Pedestrian signage is most viable option. | 1 |


| ID | Location | Description | PAC <br> Votes |
| :---: | :---: | :---: | :---: |
| NB-39 | Pony Creek Rd at Crowell Ln | Tighten radius of western curbs, pavement markings, formalize striping on Pony Creek Rd and consider all-way stop control | 2 |
| NB-40 | US 101 at Newmark St | Monitor crash history in future -- recent timing improvements may improve conditions. | 1 |
| NB-41 | US 101 near California Ave | Monitor crash history in future -- recent improvements may improve conditions. |  |
| NB-42 | OR 540 near State St | Explore enhanced striping/channelization/overhead signage to improve sight distance and driver expectancy. | 2 |
| NB-43 | Newmark St near Brussels St | Improve visibility by repave and restripe | 2 |
| NB-44 | Newmark St at Sherman Ave | Improve visibility by repave and restripe | 2 |
| ROADWAY |  |  |  |
| NB-45 | Between Broadway Ave and Sherman Ave | Identify future connections in functional classification plan of Clark St, State St, Wall St, Lombard St for local street connectivity | 1 |
| NB-46 | City wide | Maintain/fix/strengthen existing pavement system, account for maintenance in funding plan. Critical: Arterials and collectors with fair or worse pavement conditions | 3 |
| RAIL/TRUCK FREIGHT |  |  |  |
| NB-47 | Coos Bay Rail Line | Make improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels as identified in the OFP to create or improve multimodal business opportunities | 1 |
| NB-48 | US 101 at Lewis Street/Mill Casino | Address Highway Over-Dimension Load Pinch Point by raising signal head | 1 |
| NB-49 | California Ave between Sherman Ave, US 101 and the Dock Facility/North Bend Boardwalk | Address poor pavement condition (2015) data, widen roadway, improve safety at rail crossing, improve turning movements for one-way portion per OFP |  |
| NB-50 | US 101 at Florida Ave | Make modifications to accommodate high heavy vehicle volumes per OFP | 2 |
| MARINE/AIRPORT |  |  |  |
| NB-51 | City Dock: Virginia Ave/Harbor Ave | Construct a new city dock at the eastern terminus of Virginia Ave (per Downtown Waterfront District Master Plan) |  |
| NB-52 | Charleston boatyard | Improvements that include the Marine Ways | 1 |
| NB-53 | Oregon Gateway | North Spit improvements to accommodate a multi-modal marine facility to handle bulk cargo, containers and an LNG export facility | 1 |
| NB-54 | Coos Bay | Federal channel widening and deepening to accommodate larger ships and ensure safer operations | 1 |
| NB-55 | Charleston boatyard | Dock replacements | 1 |
| NB-56 | Airport | Add direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland) | 2 |


| ID | Location | Description | PAC <br> Votes |
| :---: | :--- | :--- | :--- |
| NB-57 | Airport | Provide transit service to airport if air passenger service <br> increases |  |

## Coos Bay Draft Alternatives Project List

Alternatives that impact and improve transit, bicycle, pedestrian, safety, and street network received the most votes from PAC members. Projects that received the most votes included supporting CCAT in their pursuit of building a regional transit hub, building pedestrian safety infrastructure, developing a City Bicycle Transportation Plan, maintain current roadway pavement condition, and consider rail/freight treatments where necessary.

In Coos Bay, connecting the boardwalks to create an uninterrupted five-mile boardwalk was voted as the most important pedestrian project. Among bicycle projects, people thought that implementing a road diet on Ocean Blvd and developing a City-wide bicycle transportation plan that connects arterials and collectors were equally important to their transportation future.

Meeting participants indicated that supporting CCAT in their efforts to develop a regional transit hub for the Bay Area was the most important transit project, and at 7th St at Ingersoll Ave, curb bump outs were identified as the most important safety project.

Maintaining/fixing/strengthening the existing pavement system (at Central Ave, Southwest Blvd, Koosbay Blvd, Blanco Ave, Radar Rd, Schoneman St, LaClair St, F St, Butler Rd, Juniper Ave and Fulton Ave) was selected as the most important roadway project.

The highest ranked freight project included, making improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels to create or improve multimodal business opportunities, along with an at-grade rail active warning device at Market Ave at Front St. Lastly, direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland), and making improvements that include the Marine Ways at the Charleston Boatyard were voted as the most important project among the marine/airport projects.

| ID | Location | Description | PAC |
| :--- | :--- | :--- | :---: |
| Votes |  |  |  |$|$


| ID | Location | Description | PAC <br> Votes |
| :---: | :---: | :---: | :---: |
| CB-18 | Coos Bay Boardwalk (near Anderson Ave and Market Ave) | Construct at-grade multimodal improvements (pavement) |  |
| CB-19 | US 101: Commercial Ave and Alder Ave | Improved bike/pedestrian crossings across US 101 to be consistent with Front Street Action Plan | 1 |
| CB-20 | Ocean Blvd at LcClair St | Construct a pedestrian crossing with RRFB and median refuge | 2 |
| CB-21 | Front St near Coos History Museum and Maritime Collection | North-south pedestrian pathway along the eastern side of Front St |  |
| CB-22 | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five-mile uninterrupted boardwalk. | 3 |
| BICYCLE |  |  |  |
| CB-23 | City Wide | City create a Bicycle Transportation Plan that connects Arterials, Collectors (neighborhood calming, parallel routes, signing, formal striping) | 3 |
| CB-24 | Ocean Blvd | Extend road diet west from Woodland Dr to Newmark Blvd and provide mid-block ped crossing at Wallace St and LaClair St | 3 |
| CB-25 | Newmark Ave: Ackerman Ave to Cammann St | Restripe road to provide bicycle facilities (road diet) | 1 |
| CB-26 | Woodland Dr: North City Limits to Ocean Blvd | Add bicycle facilities (add sharrows if ROW acquisition not feasible) | 2 |
| CB-27 | Newport Ln | Improve bicycle LTS through enhanced signage \& wayfinding to connect Coos Bay UGB | 1 |
| CB-28 | D St/Coos River Rd: 6th Ave to East City Limits | Widen paved shoulder and provide enhanced signage \& wayfinding |  |
| CB-29 | US 101: South couplet to Coalbank Slough Bridge | Restripe to accommodate bicycle lane (options for additional signing/striping/ramp at bridge) |  |
| CB-30 | US 101 | Provide bicycle lanes (OCBR priority) through road widening or lane diet. |  |
| TRANSIT |  |  |  |
| CB-31 | Bay Area Loop | Add weekend service | 1 |
| CB-32 | All Transit Routes | Extend service hours | 2 |
| CB-33 | US 101 \& Ocean Blvd Routes | Increase frequency \& add additional route | 1 |
| CB-34 | All Transit Routes | Add shelters and stops near community destinations | 1 |
| CB-35 | All Transit Routes | Improve bicycle and ped connectivity to stops | 2 |
| CB-36 | Bay Area | Support CCAT in their pursuit of regional transit hub | 4 |
| CB-37 | Coos Bay | Work with CCAT to identify locations for transit pull outs on busier streets |  |


| ID | Location | Description | PACETY CONCERN |
| :--- | :--- | :--- | :--- |
| Votes |  |  |  |


| ID | Location | Description | PAC <br> Votes |
| :--- | :--- | :--- | :---: |
| CB-57 | US 101 at Curtis Ave | Address Highway Over-Dimension Load Pinch Point by raising <br> signal head | 1 |
| CB-58 | US 101 at Koosbay Blvd | Make modifications to accommodate high heavy vehicle <br> volumes per OFP |  |
| CB-59 | US 101 South at <br> Commercial Ave | Make modifications to accommodate high heavy vehicle <br> volumes per OFP |  |
| CB-60 | US 101 North at Johnson <br> Ave | Make modifications to accommodate high heavy vehicle <br> volumes per OFP |  |
| CB-61 | Charleston boatyard | Improvements that include the Marine Ways |  |
| CB-62 | Oregon Gateway | North Spit improvements to accommodate a multi-modal <br> marine facility to handle bulk cargo, containers and an LNG <br> export facility <br> Federal channel widening and deepening to accommodate | M |
| CB-63 | Coos Bay | larger ships and ensure safer operations |  |

## Next Steps

The next phase of the project is to refine the draft alternatives list to a preferred alternative. The next PAC meeting is scheduled for late fall.

Remember, all materials will be posted to the project website: http://www.bayareatsps.com


## North Bend Planned Projects



## North Bend Transit Alternatives

| ID | Project Name | Location | $\begin{gathered} \text { Cost } \\ \text { Estimate } \end{gathered}$ | Primary Funding Source |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\underset{\substack{\mathrm{Ne} \\ 29}}{ }$ | Bay Area Loop Weekend Service | Bay Area Loop | N/A | ccat |  |
|  | Add weekend service |  |  |  |  |
| $\begin{gathered} \mathrm{Ne}-\mathrm{E} \\ 30 \end{gathered}$ | Transit Service Hours | All Transit Routes | N/A | CCAT |  |
|  | Extend service hours |  |  |  |  |
| ${ }_{31}^{\mathrm{NB}-1}$ | Transit Frequency | All routes and US 101/Sherman Ave | N/A | cCat |  |
|  | Increase frequency \& add additional route along US 101 and Sherman Ave |  |  |  |  |
| ${ }_{32}^{\mathrm{NB}-2}$ | Shelters and Stops | Community Destinations | N/A | ccat |  |
|  | Add shelters and stops near community destinations |  |  |  |  |
| ${ }_{33}^{\mathrm{NB}-}$ | Bik/Ped Transit Connectivity | All Transit Stops | N/A | CCAT |  |
|  | Improve bicycle and pedestrian connectivity to transit stops |  |  |  |  |



Coos Bay Planned Projects

| ID | Project Name | Location | $\begin{gathered} \text { Cost } \\ \text { Estimate } \end{gathered}$ | Primary Funding Source | Source |
| :---: | :---: | :---: | :---: | :---: | :---: |
| C8.1 | Millicoma Middle School Safe Routes to School | D St/Coos River Hwy: 6th Ave to Ross Inlet Rd | \$2M grant | Safe Routes to School | SRTS |
|  | Add sidewalks to both sides of roadway (safe routes to school). |  |  |  |  |
| CB.2 | Johnson Ave Signal Timing | Johnson Ave at US 101 North | N/A | орот | STIP |
|  | STIP project Planned to adjust timing (signal phasing and coordination) |  |  |  |  |
| C8.3 | Bunker Hill Sidewalks and Flanagan Signal | Newport Ln: Flanagan Rd to Mullen Rd | N/A | овот | STIP |

## Coos Bay Plans

| ID | Project Name | Location | $\begin{gathered} \text { Cost } \\ \text { Estimate } \end{gathered}$ | Primary Funding Source |
| :---: | :---: | :---: | :---: | :---: |
| c8.4 | Coos Bay Trail Map | City Wide | N/A | Coos Bay |
|  | Develop formalized trail map and continue to connect sidewalk system to trails or shared-use paths |  |  |  |
| C8. 5 | Safe Routes to School Plan | Coos Bay Schools | N/A | Coos Bay |
|  | Develop a Safe Routes to School Project List (Assess all connections to school, draft plan to connect safe routes to school) |  |  |  |
| c8. 6 | Functional Classification Updates | City Wide | N/A | Coos Bay |
|  | Change "Collector" term into "Major Collector" and the "Neighborhood Route" into "Minor Collector" to align with State Classification |  |  |  |
| c8.7 | Koosbay Blvd Functional Class. | Koosbay Blve: $10^{\text {oh }}$ St to US 101 | N/A | Coos Bay |
|  | Update functional classifications - Classification between 10th Street and US 101 (arterial) differs from the State's classification as an urban collector. |  |  |  |
| c. 8 | Evacuation Routes | City Wide | N/A | Coos Bay |
|  | Include evacuation routes in TSP (DOGAMI Beat the Wave) |  |  |  |
| c.9 9 | Front St Trafic Safety Plan | Front St | N/A | Coos Bay |
|  | Traffic Safety Plan in support of future development of front St |  |  |  |

## Coos Bay Pedestrian Alternatives



## Coos Bay Pedestrian Alternatives



| Coos Bay Transit Alternatives |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| ID | Project Name | Location | $\begin{gathered} \text { Cost } \\ \text { Estimate } \end{gathered}$ | Primary Funding Source |
| ${ }_{31}^{\text {cb. }}$ | Bay Area Loop Weekend Service | Bay Area Loop | N/A | CCAT |
|  | Add weekend service |  |  |  |
| $\begin{gathered} \mathrm{cb} \\ 32 \end{gathered}$ | Transit Service Hours | All Transit Routes | N/A | CCAT |
|  | Extend service hours |  |  |  |
| ${ }_{33}^{\mathrm{cb}}$ | Transit frequency | All routes and US 101/Ocean Blvd | N/A | CCAT |
|  | Increase frequency \& add addition | along US 101 and Ocean Blvd |  |  |
| $\begin{gathered} \text { c8. } \\ 34 \end{gathered}$ | Shelters and Stops | Community Destinations | N/A | CCAT |
|  | Add shelters and stops near comm | stinations |  |  |
| $\begin{aligned} & \text { cb. } \\ & 35 \end{aligned}$ | Bike/Ped Transit Connectivity | All Transit Stops | N/A | CCAT |
|  | Improve bicycle and pedestrian co | y to transit stops |  |  |
| $\begin{gathered} \text { cb. } \\ 36 \end{gathered}$ | Regional Transit Hub | Bay Area | N/A | CCAT |
|  | Support CCAT in their pursuit of a | transit hub. |  |  |
| $\begin{gathered} \text { ç. } \\ { }_{37} \end{gathered}$ | Bike/Ped Transit Connectivity | TBD | N/A | CCAT |
|  | Work with CCAT to identify locatio | nsit pull outs on busier streets. |  |  |


| Coos Bay Safety Alternatives |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| ID | Project Name | Location | $\begin{gathered} \text { Cost } \\ \text { Estimate } \end{gathered}$ | Primary Func | ing Source |
| $\begin{gathered} \text { cb- } \\ 38 \end{gathered}$ | Ocean Blvd/19" 5 St Access Management | Ocean Blvd at 19th St | TBD | Coos Bay |  |
|  | Enhanced channelization of side street to improve safety. |  |  |  |  |
| $\begin{gathered} \text { c8. } \\ { }_{39} \end{gathered}$ | Thompson Ave/Woodland Dr Safety Enhancements | Thompson Ave at Woodland Dr | \$300k | Coos Bay |  |
|  | Evaluate safety improvements: Signalization or advanced warning signage |  |  |  |  |
| $\begin{aligned} & \mathrm{cB}-{ }_{40} \end{aligned}$ | Koosbay Blvd/10 ${ }^{\text {th St }}$ Sealignment | Koosbay Blvd at 10th St | TBD | Coos Bay |  |
|  | Realign intersection to " T " to improve visibility and safety. |  |  |  |  |
| ${ }_{41}^{\mathrm{CB}}$ | US 101/Kruse Ave Access Management | US 101: near Kruse Ave | \$100k | ODOT |  |
|  | Limit access into 1st 5 S from Kruse and upgrade S Front Street and W Lockart Ave to standard. |  |  |  |  |
| ${ }_{42}^{\mathrm{cB}-2}$ | S $10^{\text {th } 5 t}$ Curb Extensions | S 10th St: near Central Ave | \$40k | Coos Bay |  |
|  | Curb bump outs (consistent through downtown) |  |  |  |  |
| ${ }_{4}^{\text {c8. }}$ | Ingersoll St Curb Extensions | Ingersoll 5 t: near 52 nd St | \$40k | Coos Bay |  |
|  | Curb bump outs (consistent through downtown) |  |  |  |  |
| ${ }_{44}^{\mathrm{cB}}$ | $7{ }^{\text {th St Curb Extensions }}$ | 7th St at Ingersoll Ave | \$40k | Coos Bay |  |
|  | Curb bump outs at $7^{\text {77 }}$ St/Ingersoll Ave. |  |  |  |  |



MEETING SUMMARY

# Coos Bay / North Bend 

January 23, 2020
Transportation System Plan Updates Public Advisory Committee (PAC) Meeting \#3
Coos Bay Council Chambers

## Attendees:

Angela Rogge, David Evans and Associates, Inc.
Jim Hossley, City of Coos Bay
Carolyn Johnson, City of Coos Bay
Chelsea Schnabel, City of North Bend
Derek Windham, City of North Bend
Virginia Elandt, ODOT
Diana Schab, North Bend Planning Commission
Glen Pederson, ODOT
Jenna Marmon, ODOT

## Introductions/Background

The purpose of the meeting was to share the preferred project lists and solicit feedback for inclusion in the Draft TSPs.

## North Bend

- Reviewed planned Safe Routes to School Project, likely design features, and location: on Broadway near Maine Ave and 14th St
- Virginia Avenue/Marion Avenue Pedestrian Crossing: Presented potential design features for a ODOT approved pedestrian crossing of Virginia Ave at Marion Ave (near Safeway)
- Would provide median island refuge in the center turn-lane on the west leg of the intersection.
- Design should consider freight/delivery trucks that turn at this intersections
- In the project sheets and TSP, want to make sure to capture the "need" of pedestrian crossings of Virginia between Broadway and Pony Village
- Broadway Avenue Lane Reconfiguration: The project team took a closer look at project NB-14b (Cape Arago Highway Bicycle Lanes - Broadway Ave section) to understand possible crosssections and the benefits/impacts
- ODOT is planning on ADA and pavement projects on Broadway and would like to explore the opportunity to combine those projects with a lane reconfiguration on Broadway Ave between Virginia and Newmark
- Initial Analysis results:
- An analysis was conducted using available traffic data. The initial analysis indicates that operations are acceptable for a 3-lane section.
- Further detailed analysis is recommended at intersections along this corridor to determine intersection delay and queuing.
- An increase in travel time of approximately 5 seconds is expected through the corridor.
- Further analysis is needed to understand impacts to side streets and appropriate lane configurations at Broadway/Virginia and near Broadway/Newmark
- General Benefits of Lane Reconfigurations
- Improve safety/reduced conflicts
- Reduce speed differentials and outlier speeds
- Improved business access and exposure
- Entering and exiting business approaches is enhanced by reducing the number of turning conflict points
- Eliminate passing within the business district
- Store fronts/signs are more easily seen
- Slower speeds=safer environment
- Eliminate "double threat" crossing
- Allow for curb extensions/bulb-outs
- Provide buffer for sidewalks
- Provide width to designate bike lanes
- Tradeoffs of Lane Reconfigurations
- Additional delay entering the highway at stop controlled intersections
- Additional travel time for vehicles traveling through the corridor (estimated at approximately 5 seconds)
- Increase in time spent following other vehicles
- Seasonal peaks (holidays)
- Potential diversion to local streets?
- Discussion:
- Most people heading north on Broadway get into the right lane anyway (left lane is underutilized)
- Would need to better understand impacts during seasonal fluctuations and at the Virginia/Broadway intersection
- Could we look at a 4-lane cross-section?
- Bicycle Route map:
- Updated Tiers to Tier 1: Separated (physical buffer or barrier), Tier II: Striped (your standard bicycle lane), Tier III: Neighborhood Route (traffic calming and sharrrows)
- Could we include Union on the bike route map
- Pedestrian Projects:
- Add in a project for sidewalks on north side of Newmark St where currently missing
- Add a pedestrian project that compliments the bicycle project CB-18 (D St/Coos River Rd Shoulder Widening)
- Bicycle Projects:
- Preferred project is not a cycle track, but a buffered bike lane.
- To facilitate the connect the boardwalk project, code amendment needed to reflect an access easement
- Revisit potential for lane restriping or lane reconfiguration on Newmark Ave (OR 540) to provide bicycle lanes. With ODOT's new Blueprint for Urban Design (BUD) guidelines, it may be feasible.
- Roadway Classification: Look to updating Union Ave to a collector instead of local road
- All other modal plans: No concerns discussed
- Revised funding plan:
- Through the planning horizon, North Bend will have approximately \$8 million to \$10 million available for capital projects.
- Implementation is to focus on relieving maintenance and rehabilitation backlog before new investment in larger capital projects


## Coos Bay

- Reviewed planned Safe Routes to School Project, expected to go to bid early spring.
- Front Street Plan/Blueprint: This project will be the next step to realizing components of the larger Front Street Action Plan.
- Development pre-applications: City continues to see new development pre-applications for:
- Hollering Place
- Housing development off of Ocean Blvd near Lindy Ln
- TSP should document the future development potential near the Hollering Place and how that could impact safety on Empire/Newmark
- Bicycle Route map:
- Updated Tiers to Tier 1: Separated (physical buffer or barrier), Tier II: Striped (your standard bicycle lane), Tier III: Neighborhood Route (traffic calming and sharrrows)
- We need to note the potential for a bike facility on Front Street - nothing specific but want it included
- Pedestrian Projects:
- Any crossings of US 101 would need Statewide traffic engineer approval (to ensure appropriate design features/location)
- Add in a project for sidewalks on north side of Newmark St where currently missing
- Bicycle Projects:
- Need to update CB-12 (Front Street Multi-Use Path) with proper extents: the funded portion is only from Greenwood to Hemlock
- To facilitate the connect the boardwalk project, code amendment needed to reflect an access easement
- Coos Bay would like shared-use path typical sections/standards
- CB-15 (Newmark Road Diet) should be extended east to the City limits. Historically, this was the plan.
- All other modal plans: No concerns discussed
- Revised funding plan:
- Through the planning horizon, Coos Bay will have approximately \$32 million to \$34 million available for capital projects.
- Implementation is to focus on relieving maintenance and rehabilitation backlog before new investment in larger capital projects

Both Cities: Draft TSPs should have a project list that captures how it impacts/benefits EACH MODE AND whether it has safety benefits. Suggest a table format that includes columns for each mode and a check mark to indicate impact.

## Next Steps

The next phase of the project is to solidify the funding/implementation memo (Tech Memo 10) and draft the TSPs. Both cities have voiced concern over the contract end date of April 30, 2020. The consultant team will work with ODOT in the coming days to determine an appropriate schedule for carrying the plans through adoption for each city. There are currently no more consultant-led PAC meetings scheduled at this time.

Remember, all materials will be posted to the project website: http://www.bayareatsps.com


Welcome
Introduction
$\rightarrow$ North Bend 1:15-2:30 PM $\quad \rightarrow$ Coos Bay 2:45-4:00 PM
Status Update
Preferred Alternatives
Code \& Policy

Funding
Implementation


## Ongoing Work

- Safe Routes to School Project
- Virginia Avenue Pedestrian Project
- Broadway Lane Reconfiguration (Project NB 14b in TSP list)
- North Bend City Code amendments



## ROAD RECONFIGURATIONS - THE BASICS



## BENEFITS OF ROAD RECONFIGURATIONS

Community/Economic
Development Benefits

- Business Access and Exposure
- Entering and exiting business approaches is enhanced by reducing the number of turning conflict points
- Eliminate passing within the business district
- Store fronts/signs are more easily seen

Walking and Biking: Safety \& Operational Benefits

- Slower speeds=safer environment
- Eliminate "double threat" crossing
- Allow for curb extensions/bulbouts
- Provide buffer for sidewalks
- Provide width to designate bike lanes



## TRADE-OFFS OF ROAD RECONFIGURATIONS

## Delay

- Additional delay entering the highway at stop controlled intersections
- Additional travel time for vehicles traveling through the corridor (estimated at approximately 5 seconds)
- Increase in time spent following other vehicles
- Seasonal peaks (holidays)



## North Bend Safe Routes to School

- Sidewalk infill, enhanced street crossings, and dedicated bicycle facilities create safer routes between neighborhoods and schools
To highlight the one-mile radius of a school, a boundary will be added to the modal plan maps in the TSP
- Helps identify projects/locations for grant funding




## North Bend City Code Recommendations

- Identified recommended modifications to the North Bend City Code to:
- Ensure consistency with the requirements of the Oregon Transportation Planning Rule (OAR 660-012, the "TPR")
- Implement the updated TSP (Code is not in conflict with any recommendations in the TSP)
- Update to reflect current best practices in transportation industry

North Bend Safety Projects


## Marine/Airport Projects

- The majority of the projects in this section are opportunities for the City to collaborate with, or otherwise support, the lead agency


North Bend Municipal Code Recommendations


## Coos Bay Ongoing Work

- Safe Routes to School Project
- Front Street Plan
- Development preapplications/applications



## Coos Bay Bicycle Routes

## - Type I Bike Routes (Separated):

- Physical barrier or extra striped buffe - In North Bend, primarily multi-use
paths

Type II Bike Routes (Striped):

- Facilitate bicycle circulation within North Bend
Primarily on collector and arterial streets
- Type III Bike Routes (Neighborhood): - Located mostly on residential and volumes and speeds
- Low-stress for individuals of all bicycling confidence levels Bicycle-specific infrastructure could consist of painted markings and
wayfinding signage wayfinding signage
- Oregon Coast Bike Route Coos Bay supports the update of the
OCBR and supports providing local connections to the route connections to the route


## Coos Bay Safe Routes to School

- Sidewalk infill, enhanced street crossings, and dedicated bicycle facilities create safer routes between neighborhoods and schools
- To highlight the onemile radius of a school, a boundary will be added to the modal plan maps in the TSP
- Helps identify projects/locations for grant funding




## Marine/Airport Projects



- The majority of the projects in this section are opportunities for the City to collaborate with, or otherwise support, the lead agency


## Coos Bay Municipal Code Recommendations

- Identified recommended modifications to the Coos Bay Municipal Code to:
- Ensure consistency with the requirements of the Oregon Transportation Planning Rule (OAR 660-012, the "TPR")
- Implement the updated TSP (Code is not in conflict with any recommendations in the TSP)
- Update to reflect current best practices in transportation industry

Coos Bay Municipal Code Recommendations


## Coos Bay Implementation



Long Term
(11-20 Years)


- Draft TSPs
- PAC Review
-Staff Report
- Planning Commission
-City Council
- Goal: TSP adoption late spring 2020
-Code/Policy could adopted separately from the TSP if necessary, but this is not preferred.

ROAD RECONFIGURATIONS- THE BASICS

- Repurposing existing space on a roadway to achieve goals (i.e. improving safety, access, economic development, etc.) through restriping

Source: FHWA, Road Diet Informational Guide 5-ane to J-tane: in some cases jumaditions have
 such ss thasod paring a
entra cross secton with
] $\sqrt{\left[\begin{array}{l}\text { Oregon } \\ \text { Doparnment } \\ \text { of Transportation }\end{array}\right.}$


BROADWAY AVE OR540 CHARACTERISTICS

- MP 0.78-1.70

AADT: 11,400-15,200 vehicles (2018)

- Projected AADT:
- Heavy Vehicles: ~3\%
- Roadway Width: ~60 feet; 5-lane
- Crashes (2009-2018)
- 3 severe injury
- 14 moderate injur
- 60 minor injury

76 property damage only

] $\sqrt{\left[\begin{array}{l}\text { oregon } \\ \text { ofogrtment } \\ \text { of Transaportation }\end{array}\right.}$

## BENEFITS OF ROAD RECONFIGURATIONS

Safety \& Operational Benefits-Driving

- Improve safety/reduced conflicts

Approximate 19 to $47 \%$ reduction in total crashes are expected following a conversion from a 4 -lane/ 5 -lane section to a 3 -lane section
Fewer conflict points for vehicles entering, exiting, or crossing the highway

- Reduce speed differentials and outlier speeds
- Average speed expected to drop by $<1 \mathrm{mph}$ along Broadway
- Consistent traffic flows for all vehicles
$\sqrt[3]{\left[\begin{array}{l}\text { oregon } \\ \text { of Tratment } \\ \text { of Transportation }\end{array}\right.}$


## Safety \& Operational Benefits



Before


After

## BENEFITS OF ROAD RECONFIGURATIONS

Walking and Biking: Safety \& Operational Benefits

- Slower speeds=safer environment
- Eliminate "double threat" crossing
- Allow for curb extensions/bulb-outs
- Provide buffer for sidewalks
- Provide width to designate bike lanes

Reduced speed differential between vehicles
Smoother operations

> mootier operations


## BENEFITS OF ROAD RECONFIGURATIONS

Community/Economic Development Benefits

- Business Access and Exposure
- Entering and exiting business approaches is enhanced by reducing the number of turning conflict points
Eliminate passing within the business district
- Store fronts/signs are more easily seen



## TRADE-OFFS OF ROAD RECONFIGURATIONS

Delay

- Additional delay entering the highway at stop controlled intersections
- Additional travel time for vehicles traveling through the corridor (estimated at approximately 5 seconds)
- Increase in time spent following other vehicles
- Seasonal peaks (holidays)

```
]/[ Oregon
    l
```



```
ADDITIONAL EXAMPLES OF ROAD RECONFIGURATIONS IN OREGON COMMUNITIES
```

- Ashland
- 4-lane to 3-lane
- AADT $=16,400$
- Reedsport - 4-lane to 3-lane
- AADT $=12,200$

Talent

- 4-lane to 3-lane
- AADT $=8,700$
$\pi=$
- Phoenix

2-lane to 1-lane (couplet)
Voted to revert to 2-lane
couplet for SB traffic (NB to couplet for SB traffic (NB to remain 1-lane

- Port Orford

4-lane to 3-lane - AADT $=5,200$

- Milton-Freewater
- 4-lane to 3-lane
- AADT $=8,200 / 12,400$





## TSP Updates <br> Introduction

- North Bend and Coos Bay TSPs were last updated in 2004
- Current update process is being conducted together to reflect the communities' shared history and ongoing connections
- TSP updates will reflect the communities' vision and priorities for the transportation system over the next 20 years

[^2]
## Project Background

Eight goals have been developed around the following themes to reflect North Bend and Coos Bay's visions for the TSP update

1. Multimodal Accessibility and Connectivity
2. Safety and Security
3. Efficient movement of people and goods (Mobility)
4. Equitable and balanced transportation system
5. Community and Economic Vitality
6. Communication, Collaboration and Coordination
7. Strategic Investment
8. Health of residents and users and impacts to the environment


## NORTH BEND

## Ongoing Work

- Safe Routes to School Project
- Virginia Avenue Pedestrian Project
- Broadway Lane Reconfiguration (Project NB 14b in TSP list)
- North Bend City Code amendments



## Project Development and Refinement

## Basis for Selection

The proposed TSP project list is based on the following factors:

- Stakeholder Feedback via in-person meetings with the PAC, conference calls with technical Agency staff, comments received on technical memoranda, and project team communications
- Previous Plans (such as 2004 TSPs)
- Fatal Flaw Analysis against adopted standards and plans



North Bend Funding Forecast

- Identified recommended modifications to the North Bend City Code to:
- Ensure consistency with the requirements of the Oregon Transportation Planning Rule (OAR 660-012, the "TPR")
- Implement the updated TSP (Code is not in conflict with any recommendations in the TSP)
- Update to reflect current best practices in transportation industry



## COOS BAY

## Coos Bay Ongoing Work

- Safe Routes to School Project
- Front Street Plan
- Development preapplications/applications


## Coos Bay Bicycle Routes

- Type I Bike Routes (Separated):
- Physical barrier or extra striped buffe
- In North Bend, primarily multi-use paths
- Type II Bike Routes (Striped):
- Facilitate bicycle circulation within North Bend
- Primarily on collector and arteria streets.
- Type III Bike Routes (Neighborhood):
- Located mostly on residential and collector streets with low traffic volumes and speeds
Low-stress for individuals of
bicycling confidence levels
Bicycle-specific infrastructure could
consist of painted markings and waytinding signage
- Oregon Coast Bike Route
- Coos Bay supports the update of the OCBR and supports providing local connections to the route



## Coos Bay Safe Routes to School

- Sidewalk infill, enhanced street crossings, and dedicated bicycle facilities create safer routes between neighborhoods and schools
- To highlight the onemile radius of a school, a boundary will be added to the modal plan maps in the TSP - Helps identify projects/locations for grant funding



## Transit Projects

| 10 | Proied Name | Primary Funding Source | - |
| :---: | :---: | :---: | :---: |
| 22 | Bay Area loop Weekend Service | ccat | funded through the Transit District |
| 23 | Transt Service Hours | ccat | - Projects are suggested as |
| 24 | Trasit frequency | ${ }^{\text {ccat }}$ | opportunities for Coos Bay to collaborate/provide input |
| 25 | Shelters and Stops | ccat | - Coos Bay can support future |
| 26 | Bike/Ped Transit Connectivity | coos bay | transit viability by designing |
| 27 | Regional Transit tub | ccat | and building streets accessible by pedestrian and bicycle |
| ${ }^{28}$ | Trans | Coos Bay/ CCA | modes |



Coos Bay Municipal Code Recommendations

- Identified recommended modifications to the Coos Bay Municipal Code to:
- Ensure consistency with the requirements of the Oregon Transportation Planning Rule (OAR 660-012, the "TPR")
- Implement the updated TSP (Code is not in conflict with any recommendations in the TSP)
- Update to reflect current best practices in transportation industry


| Next Steps |
| :--- |
| - Draft TSPs |
| - PAC Review |
| - Staff Report |
| - Planning Commission |
| - City Council |
| - Goal: TSP adoption late spring 2020 |
| •Code/Policy could adopted separately from the |
| TSP if necessary, but this is not preferred. |
|  |
|  |

Coos Bay / North Bend<br>Transportation System Plan Updates

## Alternatives Development Meeting

Conference Call/Zoom Meeting: See Outlook appointment for details

April 4, 2019
10:00 AM - Noon
Coos Bay: 10:00-11:15 AM
North Bend: 10:45-Noon

## Attendees:

Angela Rogge, David Evans and Associates, Inc. (Consultant PM)
Jim Hossley, City of Coos Bay (Public Works) Randy Dixon, City of Coos Bay (Public Works) Chelsea Schnabel, City of North Bend (Planning) Derek Windham, City of North Bend (Engineering)

Ralph Dunham, City of North Bend (Public Works)
Virginia Elandt, ODOT (Agency PM)
Ron Hughes, ODOT (Access Management)
Aaron Brooks, ODOT (Traffic)
Brian Banta, ODOT (Roadway)

## Introduction

- Angela kicked off the call by explaining the purpose of the call, which is to brainstorm and refine alternatives. This is an opportunity to have open communication between the Cities and ODOT to share ideas, ask questions and understand how alternatives can be improved to meet standards and expectations.
- After this meeting, DEA will revisit draft TM \#8 to prepare a document to distribute to the PAC.
- Comments on the draft TM \#8 are due Friday, April 12th.


## Coos Bay Alternatives (10:00 AM - 11:45 AM)

The team walked through projects that likely would require coordination between ODOT and the City:

- US 101/Johnson STIP project
- Project in design. This will modify lane configurations on Johnson Ave (ODOT has sent DEA the exhibit)
- The access changes that are a part of this project will likely have a benefit to safety
- US 101 SB has bicycle lanes in this section, but not further south. There appears that right of way is available to stripe a southbound bicycle lane.

Actions for TSP:
> Include project to add bicycle lanes on US 101 from City limits to existing bicycle lanes south of Johnson Ave. Support ODOT and County in identifying opportunities for bicycle lanes outside of UGB
> Include low priority project to increase green space at south end of couplet in order to reduce large area of pavement

- US 101/Kruse Ave channelization/turn restrictions (SPIS site)
- This intersection is included in the top $10 \%$ SPIS segment on US 101 and will likely benefit from the STIP project

Action for TSP: Include low priority/long-term project to consider diverting traffic from 1st Street South to S Front Street. Would require modernization/upgrade of S Front Street.

- US 101/Front St bicycle facilities and coordination with Rail
- City is responsible for Front Street and maintenance of crossings within couplet; north of Fir Street is not as clear.
- City mentioned the boardwalk is not an ideal location to provide bicycle access, but future development of Front Street could include a wider sidewalk that is striped for both bicycle and pedestrian traffic.

Actions for TSP:
$>$ Keep crossing draft alternatives at Market Ave and Anderson Ave (pavement)
$>$ Add alternative for "Improved Bike/Pedestrian Crossings across US 101" to be consistent with Front Street Action Plan (Commercial Ave and Alder Ave)
$>$ Add alternative for traffic safety plan in support of future development of Front Street

- $7^{\text {th }} /$ Anderson access management/channelization
- Jim explained that this location has been of concern to residents in the past, but is not a current high priority. Would like to keep it as a draft alternative.


## Action for TSP: Keep draft alternative

- Ocean Boulevard "road diet" - Phase 2
- This project is still of interest to the City
- Discussion about this project included identification of mid-block crossing locations. Midblock crossing would include RRFB treatment.
- Crossing at Wallace St, roadway geometry does not lend itself to median refuge
- Crossing at LaClair St, crossing would include pedestrian refuge

Action for TSP: Keep draft alternatives for road diet and the two crossings

- Ocean Boulevard/Newmark Ave realignment
- City recognizes the non-standard geometry of this intersection is of concern.
- There have been no previous exhibits/sketches for design at this intersection

Action for TSP: Keep draft alternative for intersection realignment

- Ped x-ing opportunities (Ocean Blvd, Woodland Dr, Thompson Rd)
- The group discussed Ocean Blvd crossings (see road diet discussion) but did not have a chance to talk about the remaining locations. However, the City has already expressed a need to connect pedestrians to the medical facilities near Woodland Dr \& Thompson Rd
- Bunker Hill (SPIS site, bike/ped, how City can support ODOT/County)
- Angela noted that this is outside the UGB but that the PAC mentioned this area early on as a point of interest. In addition, the TSP would like to support connectivity to east Coos Bay.
- ODOT noted that providing exclusive bicycle facilities across the Isthmus Slough Bridge is not feasible without widening.
- ODOT explained the STIP project identified at this originally had a larger scope, but needed to reduce project limits due to budget constraints.
- STIP project provides pedestrian sidewalk from Flanagan Road to Mullen Road and provides crossings.

Action for TSP: Add additional details to description of STIP project (pedestrian project)

## Joint Discussion (10:45 AM - 11:15 AM)

The team walked through projects that likely would require coordination between ODOT and the City:

- Sherman Ave/Koos Bay Boulevard bike/ped improvements
- There was a discussion on the history of Koos Bay Blvd and the difference of cross sections of Sherman Ave (North Bend) and Koos Bay Blvd (Coos Bay)
- The subgrade of Koos Bay Boulevard and the topography limit ability to widen.
- When asked about desire for upgrades to bicycle and pedestrian along this route, City response is that most complaints about the road are about road condition.
- Suggested an alternate bicycle route for Koos Bay Blvd is cutting west to $14^{\text {th }} \mathrm{St}$.
- Angela asked about potential for grant/special funding opportunities for emergency routes/alternate routes to US 101. Note: Following the meeting, ODOT let us know while there is no dedicated funding for alternate emergency routes (i.e. Koos Bay Blvd), listing improvements in the TSP makes it eligible for any funding that may become available.


## Actions for TSP:

> Keep Koos Bay Blvd bicycle facilities as part of long-term action plan, but suggest bicycle route/wayfinding off Koos Bay Blvd
$>$ Include importance of Koos Bay Blvd/Sherman Ave in the TSP as alternate to US 101

- US 101 Bike plan
- TSP would like to see bicycle facilities on US 101, but recognizes the barriers to implementation (right of way)
- Coos Bay noted it would like provide bicylce connectivity to downtown
- Discussed the draft Oregon Coast Bicycle Route options, which are still in development. Draft improvement options through Coos Bay/North Bend include shuttles, narrow or shift travel lanes, shift off of US 101.
- Per ODOT, alternate/parallel routes are TPR compliant.

Action for TSP: Continue to support findings/outcome of OCBR and keep draft alternative to provide a bike plan connecting arterials and collectors

- Newmark Ave/St bike/ped facilities
- Newmark Avenue is under Coos Bay jurisdiction in Coos Bay, and is under ODOT's jurisdiction as OR 540 in North Bend. Newmark St is under North Bend jurisdiction from Broadway to US 101.
- The Coos Bay portion has bicycle lanes
- Expressed thoughts on how to provide consistent bicycle lanes for entire extent.
- There could be design/safety issues traversing a bicycle lane through the channelized SBR from Broadway to Newmark
- Alternate route option could utilize Oak St, $16^{\text {th }} / 17^{\text {th }}$, Myrtle St, Commercial St, if striping bicycle lanes between Broadway and the western city limits of North Bend is infeasible
- During the North Bend discussion, group discussed keeping an option for a road diet on Newmark St as a long-term possibility. Implementation would likely require support from the community.

Actions for TSP:
$>$ Include local streets identified as potential alternate routes to OR 540
$>$ Keep Newmark St bicycle facilities as a possibility (pending support from community)

- Lakeshore Dr bike/ped facilities
- Lakeshore Dr has portions that are under Coos Bay, North Bend and Coos County jurisdiction.
- Widening is not likely a near-option, but providing sharrows and wayfinding to connect to the park system is supported (Sawmill Tribal Trail)

Action for TSP: Note that County may need to be a stakeholder in providing consistency of bicycle facilities on Lakeshore Dr

- Access management
- In general, Angela asked about how Cities can encourage access management on property that is privately owned, and how that has worked in the past. Not a lot that can be done other than cooperation and coordination, unless there is a significant change of use/redevelopment. On ODOT facilities, can implement turn restrictions into a facility (median barrier) as long as there is reasonable alternate access.


## North Bend Alternatives Discussion (11:15 AM - Noon)

The team walked through projects that likely would require coordination between ODOT and the City:

- Access management and pedestrian opportunities (Newmark Ave, Virginia Ave)
- In order to improve pedestrian comfort and PLTS score, access management (Newmark) or providing landscaping/street furniture (Virginia) are potential strategies.
- City noted that when considering access management, need to consider the impacts to emergency response vehicles. On Virginia, it is one of the primary routes emergency vehicles use.
- Discussed feasibility of consolidating accesses at Pony Village but group determined that the adequate alternate routes to business access are not feasible at this time.
- Discussed feasibility of a road diet and determined the traffic volumes are too high for the corridor the operate efficiently with reduced capacity.
- If there were wide enough shoulder, wider sidewalks or landscape buffer may be possible.


## Actions for TSP:

> Note right-of-way constraints to access consolidation and bicycle facilities on Virginia
$>$ Revise draft pedestrian alternative for Virginia to just include landscaping and street furniture that could improve PLTS, with access management if redevelopment occurs.

- Newmark Ave at Oak St (enhance visibility)
- Group discussed the proposed alternative at this location to improve safety. It was determined that new signage was posted here in response to the fatality (fatality in 2014).
- Angela asked if this project to enhance visibility was warranted if a project had already been implemented. The response was probably not.
Action for TSP: Change text for alternative to note recent improvements and "No alternative identified; continue to monitor intersection recent changes were made to improve safety"
- Washington Ave/US 101 SB/Sherman Ave (safety/crossing)
- City expressed desire to improve the safety of this crossing for pedestrians
- Angela explained that closing the west leg (cul-de-sac) to reduce the number of conflict points for vehicles was dropped as an option due to lack of community support.
- Options for improving pedestrian crossing:
- Curb bulb outs: Not enough space to maintain adequate space for vehicular movements
- Median refuge: Looked at street-view and did not believe adequare space to provide a proper refuge
- Improved lighting: Looks like an existing streetlight is already present
- Signage: Providing signage to indicate there is a pedestrian crossing appears to be most feasible option at this time.

Action for TSP: Update text for alternative to reflect signage as preferred option.

- Broadway Ave (Cape Arago) alternate bicycle route
- See prior notes to alternate routes on local facilities.
- Bike/ped enhancements to Sheridan Ave, California Ave (coordination with rail?)
- North Bend pointed out that Sheridan Ave serves the North Bend Jubilee route and is an important route and access for bike/ped in the community
- The draft alternative suggests bicycle facilities on Sheridan and accessing downtown via Florida Ave. ODOT pointed out Florida has a very steep grade and may not be the best choice for bicycles.


## Action for TSPs:

> Update draft alternative to clarify bicycle facilities are on Sheridan, not Florida
$>$ Keep project to enhance safety and improve pavement conditions on California Ave. Note that pavement is City responsibility but coordination with ODOT rail may be explored for other improvements since California is designated as an intermodal connector

- Virginia (Cape Arago) at Meade Ave (safety, traffic diversion)
- The group discussed the history of why residents cut through at Meade/Connecticut instead of staying on US 101 to OR 540 (Virginia). It used to be the primary route, and from a traffic perspective, there are less traffic signals to travel through.
- Angela explained the intention of a project here is to reduce cut-through traffic to improve safety at Meade/OR 540 (Virginia). The area is a top 10\% SPIS site, meaning it is identified by ODOT as a safety concern.
- Short of turn restrictions, group discussed other options:
- Adjust signal timing at McPherson to provide gap: Discussion with group did not think this would work without degrading conditions at McPherson.
- Curb bulb outs: This route is preferred by school buses because they need the turning radius
- All-way stop at Connecticut/Meade: Could discourage some cut-through
- Traffic calming measures and "narrowing" the feeling of the road: Keep in mind emergency vehicles and buses.

Action for TSP: Keep project on the draft alternatives for comment by the PAC and further refinement.

## Next Steps

DEA will review the comments from ODOT and the Cities and revise the draft TM \#8 for distribution to the PAC. The revised memo will include a comprehensive list of planned projects (both feasible and aspirational). The revised memo will also include the traffic analysis results for alternatives that are likely to impact capacity (traffic control changes, lane diets, turn restrictions).

DEA will send out a draft list of projects that will be first priority for planning level cost opinions and conceptual exhibits.

The next PAC meeting will be scheduled for after they have a chance to review the revised memorandum. Right now, this is looking like late May or early June, which is on track with our project schedule.

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#1:
Existing Plans and Policies Review

\section*{TECHNICAL MEMORANDUM \#1 <br> Existing Plans and Policies Review (Task 3.1) <br> Date: October 30, 2018 <br> | To: $\quad$ City of Coos Bay |  |
| :--- | :--- |
|  | City of North Bend |
|  | Oregon Department of Transportation, Region 3 | <br> From: Darci Rudzinski, Shayna Rehberg, and Courtney Simms, Angelo Planning Group Angela Rogge, PE, David Evans and Associates, Inc. <br> Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates}

The cities of Coos Bay and North Bend, in partnership with the Oregon Department of Transportation (ODOT), is updating their respective Transportation System Plans (TSPs) to guide future investments in transportation operations, maintenance, and facilities. Assisting the cities and ODOT with the TSP is the team of consulting firms of David Evans and Associates (DEA) and Angelo Planning Group (APG). The purpose of this memorandum is to assemble and distill important plans, policies and regulations that affect (and may be affected by) the TSP update process and outcomes.

## Table of Contents

State Plans and Policies........................................................................................................................... 3
Transportation Planning Rule (Oregon Administrative Rules 660-012).................................................. 3
Access Management Rule (OAR 734-051) ........................................................................................... 4
Oregon Transportation Plan (2006)..................................................................................................... 4
Oregon Highway Plan (1999, Last Updated 2015)................................................................................ 5
Oregon Bicycle and Pedestrian Plan (2016)....................................................................................... 11
Oregon Public Transportation Plan (1997, Updated in 2018).............................................................. 12
Oregon Freight Plan (2011, Amended in 2017) .................................................................................. 13
Oregon Aviation System Plan (2014) ................................................................................................. 15
Oregon Rail Plan (2014) .................................................................................................................... 15
Oregon Transportation Safety Action Plan (2016).............................................................................. 16
Oregon Resilience Plan (2013) ........................................................................................................... 16
Statewide Transportation Strategy; a 2050 Vision for Greenhouse Gas Emissions Reduction (2013)... 17
Highway Design Manual (2012) ......................................................................................................... 18
Statewide Transportation Improvement Program (STIP) (2018-2021)................................................ 19
ODOT Transportation System Plan Guidelines (2018)........................................................................ 20
Regional Plans and Policies.................................................................................................................. 21
Cities of Coos Bay and North Bend Transportation System Plan Updates ..... 2018
Coos Bay Estuary Management Plan ..... 21
Bay Area Comprehensive Economic Analysis (1998) ..... 21
Bikeway Master Plan (1991) ..... 22
Coos County Transportation System Plan (2011) ..... 25
Coos County Coordinated Human Services Public Transportation Plan (2016) ..... 25
Oregon Coast Bike Route ..... 27
Oregon Coast Trail ..... 28
Southwest Oregon Regional Airport (OTH) Master Plan (2013) ..... 29
Local Plans and Policies ..... 30
Coos Bay Comprehensive Plan 2000 (2010) ..... 30
Coos Bay Transportation System Plan (2004) ..... 30
Coos Bay Development Code ..... 31
Coos Bay Engineering Standards ..... 32
Coos Bay Economic Opportunity Analysis (2009) ..... 33
Coos Bay Downtown Traffic Plan (2010). ..... 34
Coos Bay Downtown Urban Renewal Plan (1998-2013) ..... 34
Coos Bay-Empire District Urban Renewal Plan (Updated 2012) ..... 36
Coos Waterfront Park and Walkway Concept Plan (2012) ..... 38
Front Street Action Plan (2017) ..... 38
Coos Bay Park Master Plan (2013) ..... 39
North Bend Comprehensive Plan (2017) ..... 40
North Bend Transportation System Plan (2004, Updated 2018) ..... 41
North Bend Development Code ..... 42
North Bend Engineering Standards ..... 43
North Bend Urban Renewal Plan (1994) ..... 44
Downtown Waterfront District Master Plan (1998) ..... 46
North Point Area Master Plan (2017) ..... 46
Pony Creek Greenway Concept Plan (1998/1999) ..... 48
Hollering Place Master Plan (2008) ..... 49
Jordan Cove Energy Project Traffic Impact Analysis Update (2017) ..... 50
Pony Village Traffic Impact Analysis (2013) ..... 50
North Bend Parks and Recreation Master Plan (1999, Revised 2018) ..... 51
Oregon International Port of Coos Bay Strategic Business Plan (2015) ..... 52

## State Plans and Policies

## Transportation Planning Rule (Oregon Administrative Rules 660-012)

The Transportation Planning Rule (TPR) implements Oregon Statewide Planning Goal 12, which supports transportation facilities and systems that are safe, efficient, and cost-effective and are designed to reduce reliance on single-occupancy vehicles. The objective of the TPR is to reduce air pollution, congestion, and other negative impacts to livability and to maximize investments made in the transportation system. The following subsections of the TPR will guide the TSP update.

## 660-012-0020 - Elements of Transportation System Plans

Section -0020 of the TPR specifies required plan elements, including an inventory and assessment of existing conditions; forecasts of transportation needs; a road system plan; a public transportation plan; a bicycle and pedestrian plan; air, rail, water, and pipeline plans as applicable; transportation system and demand management plans; a financing program; and implementing policies and land use regulations.

## 660-012-0035 - Evaluation and Selection of Transportation System Alternatives

 Section -0035 describes standards and alternatives available to agencies evaluating and selecting transportation projects, including benefits to different modes, land use alternatives, and environmental and economic impacts.
## 660-012-0045 - Implementation of the Transportation System Plan

The TPR requires local governments to adopt land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors and sites for their identified functions." This is achieved through a variety of measures, including locally adopting access control measures and mobility and development standards based on roadway classification. Development requirements play an important role in implementation, specifically notice requirements and coordinated review procedures for land use applications; processes to apply conditions of approval to development proposals to mitigate transportation-related impacts; and regulations ensuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities, and performance standards of facilities identified in the TSP.

## 660-012-0050 - Transportation Project Development

Section -0050 requires that transportation projects be reviewed for compliance with local and regional plans and, when applicable, undergo a NEPA environmental review process. Amendments to Section 0050 made since adoption of the 2004 Coos Bay and North Bend TSPs protect determinations of need, mode, function and general location for projects identified in TSPs.

## 660-012-0060 - Plan and Land Use Regulation Amendments

Section -0060 specifies a category of facilities, improvements, and services that can be assumed to be "in-place" or committed and available to provide transportation capacity over a 20 -year planning horizon. The TPR guides local jurisdictions in determining what transportation improvements are "reasonably likely to be provided by the end of the planning period" when considering amendments to local plans and land use regulations.

Amendments made to Section -0060 are among the most significant changes that have been made to the TPR since adoption of the cities' 2004 TSPs. The amendments require local jurisdictions to balance the need for development with the need for transportation improvements, establish the end of the planning period as the measure for determining "significant effect," define the transportation improvements that a local government can consider in determining significant effect, and identify methods to determine whether a needed transportation facility is reasonably likely to be provided within the planning horizon.

Project Relevance: Requirements in TPR Sections -0020 and -0035 will guide the development of the updated TSPs, including the evaluation of alternatives and project prioritization. Requirements in Sections -0045 and -0060 will help reviewers identify and facilitate potential changes to Coos Bay's Development Code and North Bend's City Code. Potential amendments to development code requirements will be addressed in detail in Technical Memorandum \#12 (Proposed Code Amendments).

## Access Management Rule (OAR 734-051)

Oregon Administrative Rule (OAR) 734-051 defines the state's role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. Oregon Highway Plan (OHP) Policy 3A and OAR 734-051 set access spacing standards for driveways and approaches to the state highway system. ${ }^{1}$ The most recent amendments presume that existing driveways with access to state highways have written permission from the Oregon Department of Transportation (ODOT) as required by Oregon Revised Statutes (ORS) 734. The standards are based on state highway classification and differ depending on posted speed and average daily traffic volume.

Project Relevance: Analysis for the TSP updates and final project recommendations will need to reflect State requirements for State facilities; the updated TSPs will comply or move in the direction of meeting access management standards for State facilities. Implementation measures related to the updated TSPs may entail amendments to the development code or city code to ensure that they are consistent with state access management requirements, as well as local TSP recommendations related to access management.

## Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is the state's long-range multi-modal transportation plan that addresses the future transportation needs of the State of Oregon through the year 2030. The primary function of the OTP is to establish goals, policies, strategies, and initiatives that are translated into a

[^3]series of modal plans, such as the OHP and Oregon Bike and Pedestrian Plan. The OTP considers all modes of Oregon's transportation system, including Oregon's airports; bicycle and pedestrian facilities; highways and roadways; pipelines, ports and waterway facilities; public transportation; and railroads. It assesses state, regional, and local public and private transportation facilities. In addition, the OTP provides the framework for prioritizing transportation improvements based on varied future revenue conditions, but it does not identify specific projects for development.

The OTP provides broad policy guidance and sets seven overarching goals for the state. ${ }^{2}$ Through these goals and associated policies and strategies, the OTP emphasizes:

- Maintaining and maximizing the assets in place.
- Optimizing the performance of the existing system through technology.
- Integrating transportation, land use, economic development, and the environment.
- Integrating the transportation system across jurisdictions, ownerships, and modes.
- Creating sustainable funding.
- Investing in strategic capacity enhancements.

The Implementation Framework section of the OTP describes the implementation process and how state multimodal, modal/topic plans, regional and local TSPs and master plans will further refine the OTP's broad policies and investment levels. Local TSPs can further OTP implementation by defining standards, instituting performance measures, and requiring that operational strategies be developed.

The final chapter of the OTP provides implementation and investment frameworks and key initiatives to be consulted in developing TSP projects and implementation measures.

Project Relevance: The OTP's Key Initiatives will guide the TSP updates, specifically in the areas of system management, maximizing performance of the existing transportation system using technology and creative design solutions, pursuing sustainable funding sources, and investing strategically in capacity projects. Consistent with a central OTP policy, the TSP updates will seek to maximize the performance of existing local transportation systems by the use of technology and system management before considering larger and costlier additions to the system.

## Oregon Highway Plan (1999, Last Updated 2015)

The OHP is a modal plan of the OTP that guides ODOT's Highway Division in planning, operations, and financing. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the

[^4]use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems.

The following policies are applicable to the TSP update process.

## Policy 1A: State Highway Classification System

The OHP classifies the state highway system into four levels of importance: Interstate, Statewide, Regional, and District. ODOT uses this classification system to guide management and investment decisions regarding state highway facilities. The system guides the development of the facility plans, as well as ODOT's review of local plan and zoning amendments, highway project selection, design and development, and facility management decisions including road approach permits.

US 101 (Oregon Coast Highway 009) and OR 540 (Cape Arago Highway 240) are classified in the State Classification System as a Statewide Highway and District Highway respectively. The purpose and management objectives of these highways are provided in Policy 1A, as summarized below.

- Statewide highways (US 101) typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intraurban and intra-regional trips. The management objective is to provide safe and efficient, highspeed, and continuous-flow operation. In constrained and urban areas, interruptions to flow should be minimal. Inside Special Transportation Areas (STAs), local access may also be a priority.
- District highways (OR 540) are facilities of countywide significance and function largely as county and city arterials or collectors. They provide connections and links between small-urbanized areas, rural centers, and urban hubs, and serve local access and traffic. The management objective is to provide for safe and efficient, moderate to high-speed continuous-flow operation in rural areas reflecting the surrounding environment and moderate to low-speed operation in urban and urbanizing areas for traffic flow and for pedestrian and bicycle movements. Inside STAs, local access is a priority. Inside Urban Business Areas, mobility is balanced with local access. ${ }^{3}$

The highways also have the following designations in addition to the State Classifications. The classifications are discussed in more detail under associated policies. ${ }^{4}$

- US 101 in North Bend and Coos Bay - National Highway System (NHS); National Network (NN), a federal truck/freight route designation; state Freight Route (FR); Reduction Review Route (RRR); and Scenic Byway (SB).
- OR 540 in North Bend - (from mile point -0.05 to 2.24) National Highway System (NHS); from mile point -0.05 to 0.27 , Special Transportation Area (STA); from mile point 0.27 to 0.77 , Commercial Center (CC); and from mile point 0.77 to 2.24, Urban Business Area (UBA).

[^5]
## Policy 1B: Land Use and Transportation

The purpose of this policy is to facilitate coordination of land use and transportation decision making to efficiently use public infrastructure investments to:

- Maintain the mobility and safety of the highway system;
- Foster compact development patterns in communities;
- Encourage the availability and use of transportation alternatives;
- Enhance livability and economic competitiveness; and
- Support acknowledged regional, city and county transportation system plans that are consistent with this Highway Plan.

OR 540, features three different state land use/transportation designations. As it branches off US 101 in North Bend the highway is designated an STA, which is described as a "district of compact development located on a state highway within an urban growth boundary in which the need for appropriate local access outweighs the considerations of highway mobility... Direct street connections and shared onstreet parking are encouraged. Local auto, pedestrian, bicycle and transit movements to the area are generally as important as the through movement of traffic."

The highway designation changes to UBA, which signifies "existing areas of commercial activity or future nodes or various types of centers of commercial activity within urban growth boundaries... where vehicular accessibility is important to continued economic viability. Highways that have posted speeds of 35 miles per hour or less are permitted access spacing standards that reflect the dual objectives of providing local access... while maintaining existing speeds to move through traffic. For highways posted greater than 35 miles per hour, the designation is recognition that vehicular accessibility and circulation are often as important as pedestrian, bicycle and transit accessibility, but a management plan is required to ensure that these objectives are balanced. Safe and regular street connections are encouraged. Transit turnouts, sidewalks and bicycle lanes are accommodated."

The remainder of OR 540 in North Bend is designated CC. This designation represents "large, regional centers or nodes with limited access to the state highway... The primary objective of the state highway adjacent to a Commercial Center is to maintain through traffic mobility in accordance with its function. Commercial Centers include a high level of regional accessibility and connections to the local road network. The Commercial Center accommodates pedestrian and bicycle access and circulation and, where appropriate, transit movements."

## Policy 1C: State Highway Freight System

The primary purpose of the State Highway Freight System is to facilitate efficient and reliable interstate, intrastate, and regional truck movement. This system, made up of the Interstate Highways and select Statewide, Regional, and District Highways, includes routes that carry significant tonnage of freight by truck and serve as the primary interstate and intrastate highway freight connection to ports, intermodal terminals, and urban areas. Highways included in this designation have higher highway mobility standards than other statewide highways. US 101 is a federally and state-designated freight route.

US 101 in North Bend and Coos Bay also carries a special freight-related state designation - Reduction Review Route (RRR). OAR 731-012-0010, adopted in 2013 to implement ORS 366.215, requires review of all potential actions that will alter, relocate, change, or realign a RRR and could result in permanent
reductions in vehicle-carrying capacity. Reduction of vehicle-carrying capacity means a permanent reduction in the horizontal or vertical clearance of a highway section, by a permanent physical obstruction located in usable right-of-way. If ODOT identifies that an action may result in a reduction of vehicle-carrying capacity, a Stakeholder Forum will be convened to advise ODOT regarding the effect of and response to the proposed action.

## Policy 1D: Scenic Byways

Several highways throughout the state have been designated Scenic Byways, which have exceptional scenic value. To protect the scenic assets of its Scenic Byways, ODOT has developed guidelines for aesthetic and design elements within the public right-of-way that are appropriate for Scenic Byways. US 101 is designated as a state Scenic Byway.

## Policy 1E: Lifeline Routes

The State designates routes for emergency response in the event of an earthquake. These routes are categorized as Tier 1, 2 and 3, with Tier 1 considered the most significant and necessary to ensure a functioning statewide transportation network. A functioning Tier 1 lifeline system provides traffic flow through the state and to each region. The Tier 2 lifeline routes provide additional connectivity and redundancy to the Tier 1 lifeline system. The Tier 2 system allows for direct access to more locations and increased traffic volume capacity, and it provides alternate routes in high-population regions in the event of outages on the Tier 1 system. The Tier 3 lifeline routes provide additional connectivity and redundancy to the lifeline systems provided by Tiers 1 and 2. In Coos Bay and North Bend, Highway 101 is classified as Tier 1 lifeline route, connecting to Highway 38 and I-5, which are Tier 1 routes. ${ }^{5}$

## Policy 1F: Highway Mobility Standards Access Management Policy

 Policy 1F sets mobility standards for ensuring a reliable and acceptable level of mobility on the state highway system. The standards are used to assess system needs as part of long-range, comprehensive transportation planning projects (such as TSPs), during development review, and to demonstrate compliance with the TPR.Significant amendments to Policy 1F were adopted in late 2011. The 2011 revisions addressed concerns that state transportation policy and requirements had led to unintended consequences and inhibited economic development. Policy 1F now provides a clearer policy framework for considering measures other than volume-to-capacity ( $\mathrm{v} / \mathrm{c}$ ) ratios for evaluating mobility performance. As part of these amendments, v/c ratios established in Policy 1F were changed from being standards to "targets." These targets are to be used to determine significant effect pursuant to TPR Section -0060.

Table 1 includes the mobility targets for the state facilities in the TSP study area.

[^6]Table 1: Volume to Capacity Ratio Targets Outside Metro

| VOLUME TO CAPACITY RATIO TARGETS OUTSIDE METRO ${ }^{17 \mathrm{~A}, \mathrm{~B}, \mathrm{C}, \mathrm{D}}$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Highway Category | Inside Urban Growth Boundary |  |  |  |  | Outside Urban Growth Boundary |  |
|  | STA ${ }^{\text {E }}$ | MPO | Non-MPO Outside of STAs where non- freeway posted speed $<=35$ mph, or a Designated UBA | ```Non-MPO outside of STAs where non-freeway speed \(>35\) mph but \(<45\) mph``` | Non-MPO where nonfreeway speed limit $>=45 \mathrm{mph}$ | Unincorporated Communities ${ }^{F}$ | Rural <br> Lands |
| Interstate Highways | N/A | 0.85 | N/A | N/A | 0.80 | 0.70 | 0.70 |
| Statewide Expressways | N/A | 0.85 | 0.85 | 0.80 | 0.80 | 0.70 | 0.70 |
| Freight Route on a Statewide Highway | 0.90 | 0.85 | 0.85 | 0.80 | 0.80 | 0.70 | 0.70 |
| Statewide (not a Freight Route) | 0.95 | 0.90 | 0.90 | 0.85 | 0.80 | 0.75 | 0.70 |
| Freight Route on a regional or District Highway | 0.95 | 0.90 | 0.90 | 0.85 | 0.85 | 0.75 | 0.70 |
| Expressway on a Regional or District Highway | N/A | 0.90 | N/A | 0.85 | 0.85 | 0.75 | 0.70 |
| Regional Highways | 1.0 | 0.95 | 0.90 | 0.85 | 0.85 | 0.75 | 0.70 |
| District/Local Interest Roads | 1.0 | 0.95 | 0.95 | 0.90 | 0.90 | 0.80 | 0.75 |

${ }^{\wedge}$ Unless the Oregon Transportation Commission has adopted an alternative mobility target for the impacted facility, the mobility targets in Tables 6 are considered standards for purposes of determining compliance with OAR 660012 , the Transportation Planning Rule.
${ }^{\text {B }}$ For the purposes of this policy, the peak hour shall be the 30 th highest annual hour. This approximates weekday peak hour traffic in larger urban areas. Alternatives to the 30th highest annual hour may be considered and established through alternative mobility target processes.
${ }^{\mathrm{C}}$ Highway design requirements are addressed in the Highway Design Manual (HDM).
${ }^{\mathrm{D}}$ See Action 1F. 1 for additional technical details.
${ }^{\mathrm{E}}$ Interstates and Expressways shall not be identified as Special Transportation Areas.
${ }^{\mathrm{F}}$ For unincorporated communities inside MPO boundaries, MPO mobility targets shall apply.

## Policy 1G: Major Improvements

This policy requires maintaining performance and improving safety on the highway system by improving efficiency and management on the existing roadway network before adding capacity. The state's highest priority is to preserve the functionality of the existing highway system. Tools that could be employed to improve the function of the existing interchanges include access management, transportation demand management, traffic operations modifications, and changes to local land use designations or development regulations.

After existing system preservation, the second priority is to make minor improvements to existing highway facilities, such as adding ramp signals, or making improvements to the local street network to minimize local trips on the state facility.

The third priority is to make major roadway improvements such as adding lanes to increase capacity on existing roadways. As part of this TSP process, ODOT will work with the Cities and other stakeholders to determine appropriate strategies and tools that can be implemented at the local level that are consistent with this policy.

## Policy 2B: Off-System Improvements

This policy recognizes that the State may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system. As part of this TSP update process, ODOT will work with the Cities and project stakeholders to identify improvements to the local road system that support the planned land use designations in the study area, will help preserve capacity, and will ensure the long-term efficient and effective operation of high functional class facilities.

## Policy 2F: Traffic Safety

This policy emphasizes the State's efforts to improve safety of all users of the highway system. Action 2F. 4 addresses the development and implementation of the Safety Management System, which targets resources for sites with the most significant safety issues. The TSP update process will include citywide crash analysis to identify sites with a history of fatal and serious injury crashes and identify potential countermeasures to reduce crashes.

## Policy 2G: Rail and Highway Compatibility

This policy recognizes the need to increase safety and transportation efficiency through the reduction and prevention of conflicts between railroads and highway users. The Coos Bay Rail Line is the short line railroad operating in the North Bend and Coos Bay region. It was acquired and re-opened by the Port of Coos Bay in 2011 and is currently operated by Coos Bay Rail Link. About $99 \%$ of the product moved on the rail line is related to the timber industry. The product travels on the short line to the Union Pacific interchange near Eugene, where it connects with the National Railroad System.

## Policy 3A: Classification and Spacing Standards

State policy seeks to manage the location, spacing, and type of road intersections on state highways in a manner that ensures the safe and efficient operation of state highways consistent with their highway classification.

Action 3 A. 2 calls for spacing standards to be established for state highways based on highway classification, type of area, and posted speed. Tables in OHP Appendix C present access spacing standards, which consider urban and rural highway classification, traffic volumes, speed, safety, and operational needs. The access management spacing standards established in the OHP are implemented by access management rules in OAR 734, Division 51, addressed earlier in this report. The TSP update process will evaluate existing state facilities according to these standards.

## Policy 4A: Efficiency of Freight Movement

Policy 4A emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. It seeks to balance the needs of long distance and through freight movements with
local transportation needs on highway facilities in both urban and rural areas. US 101 is a designated Freight Route.

## Policy 4B: Alternative Passenger Modes

Policy $4 B$ encourages the development of alternative passenger services and systems as part of broader corridor strategies. The policy promotes the development of alternative passenger transportation services located off the highway system to help preserve the performance and function of the state highway system. Coos County Area Transit (CCAT) currently provides local transit service in North Bend and Coos Bay; Greyhound, Pacific Crest Bus Lines (Amtrak) and Coastal Express (Curry Public Transit) provide regional service. Improving safety, access, and mobility for pedestrians and bicyclists is an objective of this TSP update process.

## Policy 4D: Transportation Demand Management

This policy supports the efficient use of the state transportation system through investment in transportation demand management (TDM) strategies. Action 4D. 1 calls for reducing peak period singleoccupancy vehicle travel and moving traffic demand out of the peak period to improve the flow of traffic on state highways. The TSP update process will review TDM strategies that can be adopted as policy, development requirements, and/or incentive programs instituted by employers and other organizations in the cities.

## Project Relevance: The TSP planning process will consider policies in the OHP

 that relate to identified improvements or modifications that would affect US 101 and OR 540. OHP policies provide guidance in developing recommendations that would impact the accessibility, mobility, or function of state highways. The TSPs are being developed in coordination with ODOT so that projects, policies, and regulations proposed as part of the local plans will comply with, or move in the direction of meeting, the standards and targets established in the OHP related to safety, access, and mobility.
## Oregon Bicycle and Pedestrian Plan (2016)

The intent of the Oregon Bicycle and Pedestrian Plan (OBPP) is to create a policy foundation for making walking and biking investments and developing strategies and programs that foster an interconnected, robust, efficient, and safe transportation system. The OBPP establishes the role of walking and biking as essential modes of travel within the context of the entire transportation system and recognizes the benefit to the people and places in Oregon.

The OBPP provides direction, namely 20 policies and associated strategies designed to develop, sustain, and improve walking and biking networks. It identifies nine goals based upon the broader goals of the OTP, which reflect statewide values and desired accomplishments relating to walking and biking:

- Goal 1: Safety
- Goal 2: Accessibility and Connectivity
- Goal 3: Mobility and Efficiency
- Goal 4: Community and Economic Vitality
- Goal 5: Equity
- Goal 6: Health
- Goal 7: Sustainability
- Goal 8: Strategic Investment
- Goal 9: Coordination, Cooperation, and Collaboration

The OBPP also provides background information related to state and federal law, funding opportunities, and implementation strategies proposed by ODOT to improve bicycle and pedestrian transportation. It outlines the role that local jurisdictions play in the implementation of the OBPP, including the development of local pedestrian and bicycle plans as stand-alone documents within TSPs.

Project Relevance: The policies and design guidance in the OBPP apply to state highway facilities in Coos Bay and North Bend (US 101 and OR 540). This policy and design guidance will also be considered in developing local street standards and bicycle and pedestrian system components in the updated TSPs. In addition, bicycle and pedestrian system improvements recommended in the updated TSPs should reflect recommended implementation strategies from the OBPP.

## Oregon Public Transportation Plan (1997, Updated in 2018)

The Oregon Public Transportation Plan (OPTP) is the modal plan of the OTP that provides guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The guiding vision from the 1997 OPTP was to create a comprehensive, interconnected, and dependable public transportation system, one that has stable funding and provides appropriate service in each area of the state.

The OPTP is being updated; a draft was released for public review in April 2018 and adoption by the Oregon Transportation Commission (OTC) is expected in September 2018. The updated OPTP is intended to establish common understandings for local, regional, and state agencies by addressing the following:

- Vision and goals for public transportation
- Policy and strategy framework to inform decision making
- Possible priorities under different levels of funding for public transportation
- Opportunities and challenges in investment and implementation
- Positioning public transportation as a key part of Oregon's transportation system

The vision stated in the draft OPTP is:
In 2045, public transportation is an integral, interconnected component of Oregon's transportation system that makes Oregon's diverse cities, towns, and communities work.
Because public transportation is convenient, affordable, and efficient, it helps further the state's
quality of life and economic vitality and contributes to the health and safety of all residents, while reducing greenhouse gas emissions.

The draft plan establishes and is organized into the following 10 goal areas:

1. Mobility - Public Transportation User Experience
2. Accessibility and Connectivity - Getting from Here to There
3. Community Livability and Economic Vitality
4. Equity
5. Health
6. Safety and Security
7. Environmental Sustainability
8. Land Use
9. Strategic Investment
10. Communications, Collaboration and Coordination

While the draft OPTP does not recommend specific projects or investments, new efforts in planning for transit come with the passage of HB 2017 (Keep Oregon Moving Act) and the establishment of a new dedicated source of funding for expanding public transportation service in Oregon. ${ }^{6}$ The Statewide Transportation Improvement Fund, or STIF, provides the impetus for coordinating the prioritization of needed infrastructure. Moneys in the STIF are continuously appropriated to finance investments and improvements in public transportation services and may be used for public transportation purposes that support the effective planning, deployment, operation, and administration STIF-funded public transportation programs. STIF moneys may be also used as the local match for state and federal funds that also provide Public Transportation Service. ${ }^{7}$

Project Relevance: The TSP update process will consider the existing transit system and intracity and intercity needs while developing recommended policies and projects related to improving transit service. Updating the transit element of the TSPs will be guided by direction from the OPTP. The project technical advisory committee includes a representative of CCAT to advise on transit policies and improvements. STIF funding will be identified as a possible funding source for transit-related capital improvements that result from the TSP

## Oregon Freight Plan (2011, Amended in 2017)

The Oregon Freight Plan (OFP) is a modal plan of the OTP that implements the state's goals and policies related to the movement of goods and commodities. Its purpose statement identifies the state's intent

[^7]to "improve freight connections to local, Native America, state, regional, national and global markets in order to increase trade-related jobs and income for workers and businesses." The objectives of the plan include prioritizing and facilitating investments in freight facilities (including rail, marine, air, and pipeline infrastructure) and adopting strategies to maintain and improve the freight transportation system.

The plan defines a statewide strategic freight network. The following facilities in the study area are considered part of the Western Corridor Strategic Corridor in the OFP: the Port of Coos Bay, US 101, Coos Bay Rail Line, and the Southwest Oregon Regional Airport.

The following policy and strategic direction provided in the OFP prioritizes preservation of strategic corridors as well as improvements to the supply chain achieved through coordination of freight and system management planning.

- Strategy 1.2: Support freight access to the Strategic Freight System. This includes proactively protecting and preserving corridors designated as strategic.
- Action 1.2.1. Preserve freight facilities included as part of the Strategic Freight System from changes that would significantly reduce the ability of these facilities to operate as efficient components of the freight system unless alternate facilities are identified or a safety-related need arises.
- Strategy 2.4: Coordinate freight improvements and system management plans on corridors comprising the Strategic Freight System with the intent to improve supply chain performance.

The OFP was amended in 2017 to maintain compliance with federal requirements that came from the FAST Act for state freight plans.

The OFP lists needs that are pertinent to the study area. The categories of freight needs are summarized below:

- Intermodal connector roads
- Vertical clearance
- Port of Coos Bay
- Rail Freight Line condition

Project Relevance: Guided by direction from the OFP, maintaining and enhancing efficiency of the truck and rail freight system in the study area, in line with direction from the OFP, will be a consideration during the TSP update process. The project technical advisory committee includes representatives from ODOT to advise on freight issues. The TSP technical documentation will detail the specific freight needs outlined in the OFP.

## Oregon Aviation System Plan (2014)

The Oregon Aviation Plan (OAP) was published in 2007 and updated with an economic impact analysis in 2014. The 2014 analysis of airports in Oregon was developed to measure economic impacts of airport facilities, within regions and throughout the state. The 2007 plan classifies airports based on their functional roles; recommends airside facilities, general/landside facilities, and services according to classification; and provides a statewide perspective relating to airport planning decisions while further refining the goals and policies of the OTP.

The Southwest Oregon Regional Airport in North Bend is classified as a Commercial Service Airport in the OAP. Based on recommended facilities and services, an analysis of the airport conducted for the 2007 plan found the need for improvements including a runway guidance system; designated cargo apron and small handling facility; a parallel taxiway; an extended runway; hangars; and food/drink services. ${ }^{8}$

Project Relevance: The TSP updates will consider goals, policies, and recommendations from the OAP in assessing the existing Air element in the TSPs, incorporating applicable policies and recommendations from the OAP as appropriate. The air transport mode plans in the TSPs will also be informed by representatives from the Southwest Oregon Regional Airport and the most recent master planning done for the airport (see summary of the 2013 Master Plan in this memorandum).

## Oregon Rail Plan (2014)

The Oregon State Rail Plan is a modal plan that addresses long-term freight and passenger rail planning in Oregon. The Plan provides a comprehensive assessment of the state's rail planning, freight rail, and passenger rail systems. It identifies specific policies concerning rail, establishes a system of integration between rail (freight and passenger elements) and the land use and transportation planning process, and calls for cooperation between state, regional, and local jurisdictions in planning for rail.

The Coos Bay Rail Line, a short line railroad, operates in the North Bend and Coos Bay region. The line travels to the Union Pacific interchange near Eugene, where it connects with the National Railroad system.

Project Relevance: The TSP updates will consider the needs of the freight rail system in the cities and region while developing recommended policies and projects for improving rail safety and mobility in the cities. The project technical advisory committee includes ODOT and Coos Bay Rail Link representative to advise on rail and freight interests.

[^8]
## Oregon Transportation Safety Action Plan (2016)

The TSAP is a multi-purpose plan that includes both a 20 - year policy plan and a 5 -year, federally compliant, Strategic Highway Safety Plan. It envisions no deaths or life-changing injuries on Oregon's transportation system by 2035. The long-term goals of the TSAP are to foster a safety culture, develop infrastructure for safety, support healthy communities, leverage technology, and coordinate agencies and stakeholders to work together, and guide strategic safety investments. The plan bases its 5 -year strategic plan on four broad emphasis areas that were identified in the planning process for improving safety: risky behaviors, such as impaired driving, distracted driving, unbelted driving, and speeding; infrastructure such as intersection improvements; protections for vulnerable users, such as pedestrians, bicyclists, and older road users; and improved systems, including data collection, training, enforcement, licensing, and emergency response. The TSAP identifies long-term goals, policies, strategies, and shortterm actions to improve transportation safety.

Project Relevance: TSAP can be used to help identify appropriate strategies to improve transportation system safety in the cities. The TSP update process will consider safety in the selection and prioritization of transportation projects, consistent with the TSAP.

## Oregon Resilience Plan (2013)

The Oregon Resilience Plan (ORP) provides policy guidance and recommendations to mitigate risks, accommodate emergency response and recovery, and support the resilience of government and business before, during, and after a Cascadia earthquake and tsunami. The plan assesses the seismic integrity of Oregon's multi-modal transportation system, including bridges and highways, rail, airports, water ports, and public transit systems.

The ORP classifies highway lifeline routes as Tier 1, 2, and 3, where Tier 1 Routes make up the transportation backbone system that provides the greatest benefits for short-term rescue and longerterm economic recovery. US 101 in North Bend and Coos Bay is designated as a Tier 1 Route.

The ORP establishes recovery targets according to mode and classifications of facilities by zone, including tsunami inundation zones and coastal zones outside tsunami inundation zones (Figure 5.22 in the plan). Targets for recovery in all mode categories are organized into three levels: minimal, operational, and functional.

The ORP makes the following recommendations regarding transportation and system planning actions, based on a gap analysis and transportation interdependency assessment.

- complete an inventory of local agency transportation assets;
- conduct an evaluation and gap analysis of local streets including transit and as well as ports, railroads, and airports;
- develop a mitigation policy and retrofit plan;
- refine an interdependency strategy;
- improve highway lifeline maps;
- enhance design and maintenance standards for transportation facilities based on lifeline route priority; and
- develop a temporary bridge strategy; and support research.

Project Relevance: The ORP provides guidance and priorities to maintain the seismic integrity of Oregon's multi-modal transportation system. Policies and standards adopted as a result of the TSP should consider additional guidance, concepts, and strategies for design related to facility resiliency in the event of seismic activity.

## Statewide Transportation Strategy; a 2050 Vision for Greenhouse Gas Emissions Reduction (2013)

The Statewide Transportation Strategy (STS) examines all aspects of the transportation system, including the movement of people and goods. It identifies transportation system, vehicle and fuel technology, and urban land use pattern strategies designed to support the STS 2050 Vision where GHG emissions (total emissions) are $60 \%$ percent lower than 1990 emissions. Emission reductions vary by mode; e.g., higher reductions can be achieved in light vehicles than in freight or air. The strategies focus on prevention and mitigation of climate impacts and not adaptation, which is addressed in other ODOT planning efforts.

The STS is consistent with the OTP and the Governor's 10-Year Energy Action Plan. However, it does not contain specific policies or goals and was not developed to be a policy document like the OTP. It is not part of the suite of adopted statewide plans, yet it is meant to inform the OTP, state modal plans, state topic plans, and metropolitan scenario planning.

The plan is advisory and presents 18 distinct strategies grouped into the following categories: vehicle and engine technology advancements; fuel technology advancements; enhanced system and operations performance; transportation options; efficient land use; and funding and pricing mechanisms. Strategies related to enhanced system and operations performance, transportation options, efficient land use, and funding include the following:

- Strategy 3 - Operations and Technology; optimizing the transportation system through operations and technology.
- Strategy 5 - Parking Management; examples and guidance are provided for small, medium, and large communities.
- Strategy 7 - Transportation Demand Management; make it easier for people to choose transportation options.
- Strategy 9 - Intracity Transit Growth and Improvements; examples and guidance are provided for small and medium communities.
- Strategy 10 - Bicycle and Pedestrian Network Growth; encourage local trips (less than 20 miles) to shift to zero-emission modes.
- Strategy 11 - Car sharing; enhance the availability of car sharing (short-term self-service vehicle rental and/or peer-to-peer) programs.
- Strategy 13 - Compact, Mixed-use Development; reduce travel distances and enhance transportation options.
- Strategy 15 - More Efficient Use of Industrial Land; encourage and incentivize through measures including better access to low-carbon freight modes.

Many of the strategies require further analysis before implementation. The STS calls for a work plan to be developed detailing potential next steps, including collaborative efforts at the federal, state, and local levels as well as with businesses and individuals.

Project Relevance: The STS is an advisory, and not regulatory, document that can be used as a resource for reducing the carbon footprint of policies, program, and projects considered in the TSP update process.

## Highway Design Manual (2012)

The 2012 Highway Design Manual (HDM) provides ODOT with uniform standards and procedures for planning studies and project development for the state's roadways. It is intended to provide guidance for the design of new construction; major reconstruction (4R); resurfacing, restoration, and rehabilitation (3R); or resurfacing (1R) projects. It is generally in agreement with the American Association of State Highway and Transportation Officials (AASHTO) document A Policy on Geometric Design of Highways and Streets - 2011. Sound engineering judgment will continue to be a vital part in the process of applying the design criteria to individual projects; the flexibility contained in the 2012 HDM supports the use of Practical Design concepts and Context Sensitive Design practices.

The HDM is to be used for all projects that are located on state highways. National Highway System or Federal-aid projects on roadways that are under local jurisdiction will typically use the 2011 AASHTO design standards or ODOT 3R design standards. Table 2 shows which design standards are applicable for certain projects based on project type, and whether or not the project involves a state route.

This manual is used in determining design requirements as they relate to the state highways in TSPs. Although the appropriate ODOT design standards are to be applied on ODOT roadway jurisdiction facilities, local adopted plans and design practices can provide additional guidance, concepts, and strategies related to roadway design.

Table 2: Design Standards Selections Matrix, ODOT Highway Design Manual

| Project Type | Roadway Jurisdiction |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | State Highways |  |  | Local Agency Roads |  |
|  | Interstate (l-5) | Urban State Highways (OR-99E, OR-211, OR214, OR-219) | Rural <br> State <br> Highways | Urban | Rural |
| Modernization/ Bridge <br> New/Replacement | ODOT <br> 4R/New Freeway | ODOT <br> 4R/New Urban | ODOT 4R/New Rural | AASHTO |  |


| Project Type | Roadway Jurisdiction | ODOT 3R |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :---: |
| Preservation/ Bridge <br> Rehabilitation 9 | ODOT 3R <br> Freeway | Orban <br> Rural | AASHTO | ODOT 3R <br> Rural |  |
| Preventive <br> Maintenance | $1 R$ | $1 R$ | $1 R$ | NA | NA |
| Safety- Operations- <br> Miscellaneous/ <br> Special Programs | ODOT <br> Freeway | ODOT <br> Urban | ODOT <br> Rural | AASHTO | ODOT 3R <br> Rural |

The HDM includes mobility standards related to project development and design that are applicable to all modernization projects; except for development review projects (see Table 3). The v/c ratios in the HDM are different from those shown in the OHP. The v/c ratio values in the OHP are used to assist in the planning phase to identify future system deficiencies; the HDM v/c ratio values provide a mobility solution that corrects those previously identified deficiencies and provides the best investment for the state over a 20 -year design life.

Table 3: 20-Year Design Mobility Standards (Volume/Capacity [V/C]) Ration

| Highway Category | Inside UGB / Non-MPO outside of <br> STAs where non-freeway speed <br> limit <45 mph | Inside UGB / Non-MPO <br> where non-freeway speed <br> limit >=45 |
| :--- | :---: | :---: |
| Interstate Highways and <br> Statewide (NHS) Expressways | 0.70 | 0.65 |
| Statewide (NHS) Non-Freight <br> Routes and Regional or District <br> Expressways | 0.75 | 0.70 |
| Regional Highways | 0.75 | 0.75 |
| District/Local Interest Roads | 0.80 | 0.75 |

Project Relevance: The HDM governs design standards on state roadways; analysis for the TSP updates and final project recommendations will need to reflect state requirements for state facilities (US 101 and OR 540). Standards and guidelines adopted by the cities may be considered for additional guidance, concepts, and strategies for design.

## Statewide Transportation Improvement Program (STIP) (2018-2021)

The State Transportation Improvement Program (STIP) is the four-year programming and funding document for transportation projects and programs on the state and regional transportation systems, including federal land and Indian reservation road systems; interstate, state, and regional highways; bridges; and public transit. The STIP includes state- and federally-funded system improvements.

[^9]The projects and programs considered for the STIP undergo a selection process that is held every two years. Development of the 2021-2024 STIP began in July 2017; ODOT expects to complete the STIP process in $2020 .{ }^{10}$ The STIP is adopted by the OTC and is approved by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) as required by federal law.

The following projects are identified in the study area in the 2018-2021 STIP:

- US101: McCullough Bridge painting (Coos Bay) - Key: 18914, applicant: ODOT, construction 2018
- US101: Johnson Avenue intersections, improve signal phasing and coordination (Coos Bay) Key: 20246, applicant: ODOT, preliminary engineering 2018 to construction 2020
- OR540: Broadway at Newmark realign (North Bend), upgrade signal poles and hardware, convert the 4-Lane roadway to 3-lane roadway with center turn lane - Key: 20219

Project Relevance: The TSP update process will take into account projects that are programmed in the STIP. An expected outcome of this planning process are identified projects and/or programs that are recommended for inclusion in the STIP.

## ODOT Transportation System Plan Guidelines (2018)

The Transportation System Plan (TSP) Guidelines are intended to assist local jurisdictions in the preparation and update of city and county TSPs. The guidelines help jurisdictions develop plans that meet local needs and comply with state regulation and policy direction, including applicable elements of the TPR, as well as the OTP and associated mode and topic plans. The TSP Guidelines answer the "What, Why and When" questions surrounding TSP projects and provide detailed direction on scoping, developing, and administering TSPs. The planning guidance is best accessed via a web-based platform (http://staging.apps.oregon.gov/ODOT/Planning/TSP-Guidelines/Pages/default.aspx) and includes helpful information and examples for both citizens and practitioners.

Project Relevance: The TSP Guidelines will be a reference for the project management team to ensure that required plan elements and methodology are employed in the update of the local TSPs. They may also be used by the cities to inform citizens and local decision makers on the required planning steps in the TSP update process and plan implementation.

[^10]
## Regional Plans and Policies

Coos Bay Estuary Management Plan
The Coos Bay Estuary Management Plan (CBEMP) regulates uses and activities on land and in water within a federally designated estuary area. Coos County is preparing to go through the process to update the plan. The existing CBEMP provides policies to guide development, protection, and conservation activities. All allowed uses and activities are subject to compliance with applicable CBEMP policies.

The plan defines three management units based on conditions and types of uses permitted:

- Natural - protects natural features by limiting development;
- Conservation - permits all Natural uses but also allows some water-dependent recreational uses; and
- Development - permits all Natural and Conservation uses as well as water-dependent industrial and commercial uses.
"Land transportation facilities," which include highways, bridges and associated structures, and railroads, are uses regulated in the management units and shoreland segments designated throughout the estuary area. They are generally allowed outright or with special conditions specified in the plan. Land transportation facilities are prohibited in a few of the shoreland segments with Conservation Shoreland (CS) management classifications, including Shoreland Segments 24 and 45 (Upper Bay Eastside), Shoreland Segment 52 (Lower Bay - Coos Bay), and Shoreland Segment 53 (Lower Bay - Coos Bay/North Bend).

In terms of specific road projects, CBEMP Policy 71 allowed for the minimum fills necessary for the East Catching Slough Road widening, a project deemed an emergency in order to protect public safety and welfare. The policy established that no administrative reviews or conditional use permits are needed for the project to be found consistent with the CBEMP.

Project Relevance: Improvements proposed within the CBEMP boundaries during the TSP update process must comply with plan regulations and restrictions regarding transportation facilities.

## Bay Area Comprehensive Economic Analysis (1998)

The Bay Area Comprehensive Economic Analysis assessed employment land needs and formulated a regional economic development strategy comprised of objectives and action plan recommendations.

Commercial and industrial land needs were estimated for both a baseline scenario (based on State of Oregon employment projections) and a "potential" scenario in which a new steel mill and natural gas pipeline would be developed. The land needs assessment found a need for commercial land under both scenarios and in both the short term and long term.

The regional economic development strategy is driven by the following objectives.

- to coordinate, as a region, on issues related to economic development (including land use planning);
- to promote development of the region's traditional natural-resource-based industries as well as tourism, medical facilities, and new industries and commercial businesses;
- to ensure the region is served by public services and transportation that will meet the needs of existing and potential businesses;
- to promote the region's shipping and maritime resources;
- to encourage tourism; and
- to enhance the waterfront areas of downtown North Bend and Coos Bay.

The objectives were used to evaluate local and regional plans and regulations, such as local comprehensive plans, development ordinances, urban renewal plans, and a regional transportation study. Resulting recommendations include proposed amendments to the comprehensive plans and development ordinances as well as ways to build upon direction from the other documents.

Project Relevance: The Bay Area Comprehensive Economic Analysis may be of limited relevance due to the dated projections and land needs assumptions. More recent analysis, such as the industrial and commercial land needs findings in the 2009 Coos Bay Economic Analysis, can provide more updated direction. However, the older economic development strategy objectives may be considered when formulating recommendations for the updated TSPs.

## Bikeway Master Plan (1991)

The Bikeway Master Plan covers the Coos Bay/North Bend Bay Area and areas around Coos County parks. It is a comprehensive plan for all bicycle related needs in the Bay Area, as well as a park-centered plan for the rural areas of Coos County. Developed with the assistance of local and statewide government agencies, advisory committees, and advocates, the plan describes the existing bikeway systems within the area, system deficiencies and user concerns, and usage projections. Within the cities, bicycle trips were found to typically be made for utility purposes between core areas such as US 101, Ocean Boulevard, Newmark Street, and other arterial and collector streets. Outside the cities, trips were more recreational in nature. To improve biking experiences, the plan recommends specific cost-effective measures including encouragement, project review, safety, and education measures (Section 5.5). The plan also identifies ways of determining needed improvements and provides a preliminary bicycle network map for the Bay Area (Figure 1).

Plan policies include the following:

- Maintain existing bikeways and assure funds are allocated to continue maintenance of new facilities.
- When improving designated routes, anticipated usage, safety, and construction costs shall be the primary considerations. Safe transportation of vehicles on streets is a higher priority than storage of vehicles on streets.
- Assure facilities satisfy the utilitarian and recreational needs of county residents and visiting bicyclists.
- Emphasize roadway bikeways, due to the construction and maintenance costs of separated paths. Always consider bikeways in future roadway projects.

Assist appropriate agencies with the development of safety and education programs.
Establish a Coos County Bicycle Advisory Committee
The plan recommended the following regulations:

- Accommodate bicyclists on shoulder bikeways on US 101 and State Highway 42
- Designate routes along Cape Arago Highway, Coos River Highway, Powers Highway, and Highway 42 South.

The plan recommends that the cities first establish a route network that will access a variety of destinations and traffic generators. The primary objective behind recommended projects was to link the following routes and locations:

- Oregon Coast Bike Route
- Highway 101
- Downtown Core Areas
- Schools, Parks, Shopping, and Employment Centers
- Empire Lakes Recreation Routes
- Popular out-of-town routes (Cape Arago, Coos River, Libby)

The improvements needed to establish an urban route network within the Bay Area are listed and shown in Figures 8.3.2 and 8.3.3 in the plan (see Figure 1).

Project Relevance: The Bikeway Master Plan provides policy direction and a comprehensive set of planned and prioritized bicycle network improvements. Due to the age of the plan document, the relevance of its policies and projects will be evaluated for relevancy to this TSP update project.

Figure 1. Bay Area Bikeway Master Plan Proposed Improvements


## Coos County Transportation System Plan (2011)

The Coos County TSP establishes transportation planning goals and objectives and recommends a multimodal set of plans to address existing and future system deficiencies. The Coos County TSP governs transportation planning in the area outside of UGBs, but also includes policies that address County roadways within urbanizing areas. Such policies include directing the County to work with local jurisdictions to establish cooperative road improvement programs and jurisdictional transfers within urban growth areas. The TSP affirms that construction or reconstruction of County roadways inside UGBs should be consistent with the city's road design standards in order to facilitate a potential jurisdictional transfer in the future. For roadways in a UGB or urban unincorporated community without adopted standards, the County TSP road design standards are applied.

There are a handful of projects on county roads adjacent to or in close proximity to the Coos Bay and North Bend UGBs, including the following: ${ }^{11}$

- Roadway paving projects (R-25 and R-28)
- Bridge rehabilitation/replacement projects (B-14)
- Natural hazard (slide) mitigation projects (NH-1 and NH-18)
- Roadway safety (advance signage) projects (S-34 and S-35)
- Other system improvement (signalization and turn lanes) projects (OS-1, OS-4, OS-5, and OS-7)
- Bicycle/pedestrian (sidewalk) projects (BP-4), in Coos Bay

The County and cities coordinate transit service between cities and other locations in the county through CCAT planning efforts. The County and Port of Coos Bay coordinate on rail, pipeline, and water transportation planning.

> Project Relevance: This planning project will consider Coos County TSP policies that relate to both the County and Cities in updating policies for the Coos Bay and North Bend TSPs (e.g., jurisdictional transfer). As needed and appropriate, the TSP updates will coordinate projects, programming, and planning with the Coos County representative on the technical advisory committee.

## Coos County Coordinated Human Services Public Transportation Plan (2016)

 Coordinated public transportation plans are required by the Federal Transit Administration (FTA) and ODOT for recipients of FTA Section 5310 program funds and State Transportation Funds (STF). They differ from Transit Development Plans ${ }^{12}$ in that they focus on engaging public transportation and health service providers in collaboratively identifying and addressing the public transportation needs of special[^11]needs populations rather than identifying transit service improvements more generally for the population of Coos County.

The Coordinated Human Services Public Transportation Plan documents existing conditions and transit services describes stakeholder outreach conducted during the planning process, and establishes needs, strategies, and priorities for public transportation in Coos County. Based on needs, the plan identified the following strategies, by priority category.

## High Priority

- Seek funding to preserve existing levels of public transit services within the County as the highest priority, with expansion of service as additional funding becomes available and demand justifies.
- As funding permits, expand access to and convenience of public transportation.
- Improve freedom of movement and quality of life for transit dependent populations and assure transportation access to jobs, health care, education and other basic services.
- Develop a volunteer driver program to address the increase in demand for services.
- Continually strive to coordinate the planning for and provision of public transportation services with the provision of human and health services.


## Medium Priority

- Expand efforts to inform the public of available public transportation services, including lowincome and non-English speaking populations.
- Continue to pursue opportunities for regional collaboration and expansion of the regional transportation system.


## Low Priority

- Improve public transportation services to rural portions of the county.
- Establish mechanisms for routinely monitoring plan implementation.

Actions to implement these strategies are generally not specified for specific locations. High priority actions that may have greater applicability for the cities and transportation system planning include the following:

- collaborate with the Coquille Tribe on a pilot program for shuttle services for casino employees seeking to access key services (e.g., Fred Meyer) from employee housing;
- consider an additional loop circulator between Coos Bay and North Bend;
- address safety and convenience of transit stops, such as lack of curb ramps (at crossings) and stops without shelters;
- improve pedestrian and bicycle connections to transit stops;
- locate transit stops at senior centers and retirement facilities where feasible; and
- coordinate with health care facilities regarding providing transportation for their employees.

Project Relevance: The TSP updates will be coordinated with CCAT and other transit service providers at strategic points during the project. High priority actions from the Coordinated Human Services Public Transportation Plan will be considered during the evaluation and prioritization of needed transportation projects. Coordination between the TSP planning process and outcomes and the planned development of the Coos County Area Transit Transportation Master Plan is also important for successful transit planning in the cities. Development and zoning code amendments related to transit access and transit stop improvements is an expected outcome of this planning project.

## Oregon Coast Bike Route

The Oregon Coast Bike Route (OCBR) is an approximately 370-mile bike route from Washington to California that was designated by the OTC in the early 1980s. For the most part, the OCBR follows US 101 as a shoulder bikeway. In some areas, the route departs from US 101 and follows county roads or city streets to take advantage of closer proximity to the ocean, scenic views, lower traffic volumes, and slower traffic speeds. Through ridership is estimated to be 6,000-10,000 people annually, with riders predominantly traveling from north to south. The OCBR also serves people taking shorter trips between and within communities along the route.

Figure 2. Oregon Coast Bike Route Maps


Sources:
https://www.oregon.gov/ODOT/Programs/TDD\ Documents/oregon-coast-bike-route-map.pdf and http://www.co.coos.or.us/Portals/0/Planning/cctsp03-28-11.pdf

ODOT has commissioned an OCBR Plan project to ensure the OCBR stays competitive as a bicycle tourism destination and better serves local residents using the route for bike commuting, thereby helping to reduce motorized vehicle demand on US 101. The OCBR and US 101 are currently being
evaluated for safety, accessibility, and enjoyment for both local community members and visitors. The planning process includes analysis of the current alignment and identification of opportunities to modify the OCBR alignment, given analysis findings related to traffic speeds, traffic volumes, roadway geometry conditions, aesthetic conditions, bicycle traffic attractors, and bicycle traffic generators. The resulting plan for the OCBR will feature current best practices in bicycle facility design and will propose locations for recommended facility improvements.

The current alignment of the OCBR through North Bend and Coos Bay, on a smaller and larger scale as taken from the OCBR map website and the Coos County TSP, is show in Figure 2.

Project Relevance: The TSP updates will be informed by current OCBR planning and will coordinate new policy, programming, and projects related to biking that result from both planning projects.

## Oregon Coast Trail

The Oregon Coast Trail is a 382-mile hiking route that mostly travels on beaches, with some segments wind through state parks or public lands. Other segments of the trail pass through private property on easements or are located on the shoulders of US 101, county roads, and city streets.

Figure 3 shows the Oregon Coast Trail alignment through North Bend and Coos Bay, which coincides with the OCBR alignment.

Figure 3. Oregon Coast Trail Map


Source: https://www.oregon.gov/oprd/PARKS/docs/OCT g.pdf

Project Relevance: The TSP update project will consider the presence and asset of the Oregon Coast Trail in creating new policy, programming, and projects related to walking in the updated TSPs.

## Southwest Oregon Regional Airport (OTH) Master Plan (2013)

The Southwest Oregon Regional Airport (OTH) Master Plan provides a comprehensive look at existing airport facilities and future needs. It describes infrastructure plans that meet future aviation demands and provide the framework needed to guide airport development. As detailed in the plan's Growth Forecast, the projected growth of the airport expects to remain about the same, with the possibility of a $20 \%$ increase in based aircraft and about $30 \%$ increase in passenger enplanements by 2030 (from 2010). The primary means of ground travel to the Southwest Oregon Regional Airport consists of personal automobiles, taxicabs/shuttle buses, or rental cars. There is no public mass transit available at the airport. Capacity of all the off-airport access roads is considered adequate throughout the 20-year planning period. The on-airport general public access roads (East Airport Way and West Airport Way off Maple Leaf Lane, two-lane interior streets) are currently adequate to serve demand. The plan anticipates that, as new development occurs in the non-aviation area, it may be necessary to modify these access roads to accommodate new tenants and their specific needs.

Project Relevance: The airport Master Plan will inform the Air element of the updated TSPs. The plan identifies most transportation routes to and from the airport to be adequate for the forecasted growth. Proposed transportation improvements in the updated North Bend TSP that impact airport access will be coordinated with the Airport.

## Local Plans and Policies

Coos Bay Comprehensive Plan 2000 (2010)
The Coos Bay Comprehensive Plan was originally adopted in 1981 and has been subsequently amended several times. It establishes a guide for the growth and development of the City and contains statements of public policy that guide the City's decision-making process. Comprehensive Plan Chapter 7, Identification of Problems, Planning Issues, Goals, and Plan Implementation Strategies, includes Section 7.8, Transportation. This Section was updated in 2004 to incorporate by reference Chapter 2, Goals and Policies, from 2004 Transportation System Plan. Existing Goals and Policies are discussed in detail in Technical Memorandum \#2, Goals, Objectives, and Evaluation Criteria.

Project Relevance: TSPs are adopted as the transportation element of a local Comprehensive Plan; updates to North Bend and Coos Bay TSPs will need to be reflected in the respective comprehensive plans. It is expected that recommendations that result from this planning process will necessitate an update to Coos Bay Comprehensive Plan Section 7.8. This can be accomplished by adopting the relevant TSP section(s) by reference, as was done after the 2004 TSP was adopted or by creating separate, but consistent, Comprehensive Plan policies. Transportation policies may be contained in the adopted TSP or the Comprehensive Plan document can be modified to include them.

## Coos Bay Transportation System Plan (2004)

The Coos Bay TSP guides the development and management of transportation facilities in the city, reflecting community goals and objectives and providing consistency with state, regional, and local plans. The current plan was adopted in 2004 and is approaching the end of its planning horizon. Recent development and planning efforts, as well as the need for safer and more accessible walking and biking facilities, economic development, and mitigation of tourist season transportation system impacts, are driving the update of the Coos Bay TSP.

The 2004 TSP establishes transportation goals and policies, which were incorporated by reference into Section 7.8, Transportation, of the Coos Bay Comprehensive Plan. These goals and policies are discussed in detail in Technical Memorandum \#2, Goals, Objectives, and Evaluation Criteria. The TSP establishes standards for access management and street design, recommends multimodal improvements to address the city's transportation needs, and explores potential funding sources to implement these projects.

Project Relevance: The TSP update process will review goals, policies, standards, and recommended projects from the 2004 TSP to determine what needs to be retained or changed in the updated TSP. This planning process will update recommended transportation improvement projects for all modes, based on existing and projected needs. Updated data, stakeholder and community involvement, and evaluation criteria will be used in making these recommendations.

## Coos Bay Development Code

The City of Coos Bay Development Code (CBDC), Title 17 of the Municipal Code, implements the longrange land use vision embodied in the Coos Bay Comprehensive Plan, regulates uses within the city, and establishes standards for development and land divisions. Key existing development standards are summarized below. ${ }^{13}$

## Pedestrian and Bicycle Access and Circulation

Pedestrian and bicycle access and circulation are implemented through both required improvements internal to a development site and transportation system (usually roadway design) standards.

On-site development standards - Pedestrian circulation and connection standards are set in the Industrial-Commercial (I-C) District and Hollering Place (HP) District. Type III site plan submittals are required to show the location and dimensions of proposed pedestrian connections between the street and buildings, between buildings, and between buildings and on-site or off-site parking areas (CBDC 17.320.050).

Transportation system standards - Improvement plans required for subdivisions must demonstrate compliance with City ordinances pertaining to streets, i.e., Engineering Standards, adopted by ordinance (CBDC 17.315.070); the same requirements are not specified for partitions or site plans. Engineering Standards and cross sections (typical minimum street design standards) in the 2004 TSP require sidewalks for all functional classifications of streets and require bike lanes for arterials and collectors but not for commercial/industrial streets and local streets.

## Vehicle and Bicycle Parking

Off-street parking standards are established in CBCD 17.340. Vehicle parking standards allow for shared parking when it can be demonstrated that times of parking needs do not overlap and exempt the Downtown Parking District from off-street parking requirements. Bicycle parking requirements are generally established for uses other than single-family dwellings and duplexes (CBDC 17.340.030.4). Bicycle parking requirements for commercial, industrial, institutional, and public uses are scaled to the amount of required vehicle parking, and in some cases vehicle parking is not required (Downtown) or for commercial uses the requirement is low (one space per 50 vehicle parking spaces required).

## Traffic Impact Analyses and Performance Standards

Waterfront Heritage (WH) District provisions in the CBDC require a "trip analysis" - a report of the average daily traffic (ADT) estimated for a use proposed in that district (CBDC 17.240.070.16). Traffic impact analysis (TIA) requirements and guidelines are established in the Engineering Standards but are not referenced in the CBDC. Level of service (LOS) is discussed in the 2004 TSP and a standard of LOS D for the PM peak hour is set in the City Engineering Standards.

[^12]
## Application Review and Coordination

Pre-application conferences are required for Type II, III, and IV procedures. ${ }^{14}$ Pre-application provisions require the City to notify "interested agencies" of the upcoming pre-application conference (CBDC 17.130.020.4.a). Presumably, notification of proposals that would have an impact on US 101 or OR 540 would be sent to ODOT; potential impacts on the transit system should be noticed to CCAT.
Requirements are not established for Type II and III procedures that notice of a complete application or an upcoming hearing be provided to transportation service and facility agencies.

## TPR Consistency

Existing criteria related to proposed comprehensive plan amendments or zone changes do not explicitly address compliance with the TPR. Existing criteria require the approval body to consider the "cumulative effects" of the proposed amendment, which includes sufficiency of transportation facilities (CBDC 17.215.010) and to ensure that approval of the amendment will not result in a decrease in the level-ofservice for capital facilities identified in City capital improvement plans (CBDC 17.215.060.1.c).

Project Relevance: Amendments to the CBDC regarding connectivity, pedestrian and bicycle access and circulation, bicycle parking, development review coordination, zoning and plan amendments, and other development requirements will be considered as part of implementation of the updated TSPs. Proposed amendments will address consistency with the TPR and will implement recommendations in the updated TSPs. Consistency will need to be ensured between standards in the CBDC, updated TSP, and Engineering

## Coos Bay Engineering Standards

Coos Bay Engineering Standards are adopted by ordinance and are contained in Title 18 of the Coos Bay Municipal Code. Section 18.15 addresses transportation facilities and Section 18.40 establishes TIA requirements and guidelines.

The following transportation facility standards are set Section 18.40:

- Level of service (LOS) standards for the PM peak hour
- Minimum street design dimensions (Table 3-1)
- "Walking zone" (curb, planting strip, and sidewalk) minimum requirements (Table 3-3)
- Multi-use pathway design requirements (Table 3-10)
- Requirements for coordination with CCAT for development within 100 feet of existing or planned transit routes and stops

[^13]Project Relevance: The TSP update needs to either be consistent with existing performance, design, and TIA requirements established in the Coos Bay Engineering Standards or propose amendments to the Engineering Standards so that requirements are consistent between the two documents.

## Coos Bay Economic Opportunity Analysis (2009)

The Coos Bay Economic Opportunity Analysis was conducted as an update to the City's Comprehensive Plan consistent with Statewide Planning Goal 9 (Economy). Community economic development objectives developed for the report include the following:

- Create a more diversified economy.
- Become ready for economic opportunities aligned with 21st century trends.
- Support the creation of necessary improvements to the Oregon International Port of Coos Bay to attract and stimulate economic opportunities.
- Increase the City's short-term availability of industrial and commercial sites.
- Serve as a regional hub for commercial and professional support services.

The report documents transportation concerns heard in interviews conducted for the analysis, including: the Central Oregon \& Pacific Railroad (CORP) Coos Bay Line was in need of significant repair, including repairs to the rail bridge across Coos Bay; ${ }^{15}$ Coos Bay is far from a major interstate freeway (I-5); and Highways 38 and 42 were considered to have limited capacity and to be constraints to attracting freightdependent industries to the area.

Target industries for economic development identified through the analysis are listed below and were determined based on research and agency and local stakeholder interviews.

- Water-dependent industries and enterprises
- Industries that don't require access to Interstate 5
- Businesses relating to outdoor recreation
- Wood products and commercial fishing industries
- Solar and metal fabrication
- Technology industries dependent on location near fiber optic lines
- Tourism

The report finds that there are significant shortages of needed industrial land in the short- and longterm and a small shortage of needed commercial land in the long-term. It concludes that rezoning and/or a UGB expansion should be considered to address these needs.

[^14]Project Relevance: Policy, project, and program recommendations evaluated for the updated TSPs should consider the economic development objectives and target industries identified in the Coos Bay Economic Opportunity Analysis.

## Coos Bay Downtown Traffic Plan (2010)

The Coos Bay Downtown Traffic Plan was prepared for the central business district in downtown and the surrounding area to address circulation and operation concerns. The analysis evaluated converting oneway streets to two-way streets and mitigation measures for identified intersections and "hot spots" in the study area.

The plan concludes with the following recommendations:

- Remove existing traffic signal on Anderson Avenue at S. $2^{\text {nd }}$ Street;
- Reconfigure the $7^{\text {th }}$ Street intersection; and
- Institute a road diet on Ocean Boulevard and Central Avenue.

Project Relevance: Recommendations from the Downtown Traffic Plan should be evaluated as to whether they are still needed and should be incorporated into Coos Bay's updated TSP.

## Coos Bay Downtown Urban Renewal Plan (1998-2013)

The Coos Bay Urban Renewal District is comprised of the following: lands adjacent to the city's waterfront in its business district; the Eastside industrial and commercial properties, where land has the most potential for industrial expansion; the downtown core area; and land in the south end of the city between the waterfront and US 101, which was experiencing significant commercial expansion at the time the plan was drafted and was indicated as having the potential for commercial and industrial expansion contingent upon infrastructure improvements. See Figure 4.

The plan's goals consist of the following:

1. Develop the city's waterfront to enhance its potential for recreation, tourism and other commercial activities while preserving its alternate role as a working waterfront which supports the area's forest products and marine related economy.
2. Revitalize the downtown core area by repair and change to, but not total elimination of, the pedestrian mall and by other activities which promote the effective utilization of this area for a wide variety of purposes while recognizing its changing role away from high traffic, consumer retail activities.
3. Improvement of streets, utilities and other essential infrastructures in areas of the city within the district where they have deteriorated, are non-existent or where modifications are necessary to support and/or encourage the expansion of new commercial and industrial activity.

The plan recommends a set of urban renewal projects in three categories:

- Waterfront development - including a boardwalk and two pedestrian access points across railroad tracks
- Core area revitalization - including a convention/performing arts center and a linear park along the waterfront
- Streets and infrastructure - including a First Street/US 101 connection and a bicycle path along US 101 in the northern part of the urban renewal area

The projects and uses recommended in the plan were found to be consistent with zoning at the time of the plan, which concluded rezoning would not be necessary.

Figure 4. Downtown Urban Renewal District


Project Relevance: Updated transportation policies developed for the updated Coos Bay TSP should reflect or be consistent with goals presented in the Downtown Urban Renewal Plan. Projects recommended in the plan will be reviewed for possible inclusion in the updated Coos Bay TSP.

## Coos Bay-Empire District Urban Renewal Plan (Updated 2012)

The Coos Bay-Empire District Urban Renewal Plan was prepared in order to achieve the vision for the district (see Figure 5). This vision, presented below, was in turn translated into a set of plan objectives, organized by Primary Commercial Area, Waterfront, Empire Boulevard and Bayfront, General Commercial and Residential, and General District.
...provide for a more attractive living, working and shopping environment in the Empire District commercial area and along the waterfront. The commercial area... should be revitalized as a general commercial center and as a commercial area providing services to tourists. The area should be enhanced in order to fulfill a greater role in serving the Empire District residents with a variety of cultural, recreational and social services. The waterfront area should provide the focus for enhanced public and private tourist oriented recreational and commercial uses and activities. By facilitating an attractive waterfront, attention will be drawn to the Bay which will improve the connectivity between the commercial area and the waterfront.

Figure 5. Coos Bay-Empire District Urban Renewal District


The plan called for rezoning of land in the district to General Commercial as well as for projects in three phases reaching from FY 1996-97 to FY 2015-16, including the following:

- Phase I - Improvements to Newmark Avenue (street trees, pedestrian crossing, and street furniture consistent with a district design theme); general public facility improvements sidewalks, open spaces, and restrooms; and development of a major open space/park on the waterfront.
- Phase II - Rehabilitation of the old wharf structure or boardwalk; and completion of Newmark Avenue widening project (including new pavement, bike lanes, curbs, and sidewalks)
- Phase III - Continued improvement of the pier/boardwalk; street improvements (different combinations of pavement, curbs, gutters, and sidewalks) for Main Street, Salmon Avenue, Mill Street, Schetter Street, Wall Street, and Cammann Street; planned improvements for Newmark Avenue and Michigan Street that establish strong pedestrian and vehicular connections between the waterfront and primary commercial area in the district; and development of two tourist facilities that will include a viewing area along Empire Boulevard with interpretive kiosks and restrooms and a parking lot on Newmark Avenue.

The Coos Bay-Empire Urban Renewal Plan is currently undergoing review and revisions and is expected to be updated by the end of 2017.

Project Relevance: Transportation-related objectives from the Coos Bay-Empire Urban Renewal District will be consistent with updated transportation policies for the Coos Bay TSP. Projects recommended in the updated plan will be considered for inclusion in the updated Coos Bay TSP.

Figure 6. Coos Waterfront Walkway


## Coos Waterfront Park and Walkway Concept Plan (2012)

The Coos Waterfront Park and Walkway Concept Plan is a draft concept plan for a new waterfront park and walkway that will run along the Bayfront in downtown Coos Bay and North Bend (see Figure 6). The Plan covers fundraising and technical plans for the park and walkway and outlines next steps towards implementation of the concept.

The waterfront plan specifies major objectives for the waterfront listed under the following headings:
Recreation; Wildlife, Water Quality and Aquatic Habitat; Public Safety Public Relations, Information and Cooperation; Maintenance; Community Cohesion; and Signage, Interpretation and Education. Most of the objectives, as they apply to the TSP, can be summarized as the community desires to provide a safe, aesthetically pleasing, multi-use corridor for nonmotorized recreation.

One of the main guidelines was to create a non-motorized route connecting North Bend and Coos Bay and generate increased activity along the waterfront. The plan contains safety objectives for the waterfront, including ADA standards and ways to minimize conflicts between diverse users. Long-term possibilities articulated in the plan include the idea of a trolley car on the downtown rails along the waterfront, a water taxi service, and a biking trail along the rail line to Coquille.

## Project Relevance: The Waterfront Park and

 Walkway Concept Plan will help with developing the guidelines for any planning along the waterfront, including objectives and potential funding sources and project priority.
## Front Street Action Plan (2017)

The Front Street Action Plan's purpose is to identify implementable actions in the Front Street area that increase connectivity, foster community access to the waterfront, attract private investment, and diversify Coos Bay's economy.

The Action Plan builds upon previous planning efforts aimed at supporting redevelopment on Front Street, including the Waterfront Park and Walkway Plan (2012), the Front Street Master Plan (1998), the Downtown Urban Renewal Plan (1988), and Coos Bay's Comprehensive Plan update (2010). The plan uses financial and market analyses and ideas from community members and stakeholders to determine improvements in the area that will facilitate redevelopment. Improvements are organized into the following components:

- Development framework - A framework map shows potential opportunity sites and pedestrian connections.
- Traffic configuration - A preferred traffic reconfiguration map shows Front Street north of Alder Avenue converted to one-way and allowing for on-street parking, and south of Alder Avenue retaining its two-way configuration.
- Investment framework - This framework discusses partnerships with private, community, and public sector (local and state) entities necessary for spurring redevelopment and recommends the following types of projects:
- Near-term catalytic projects - including water access improvements and identification of funding sources for priority projects, particularly infrastructure improvements
- Development-supportive programs and investments - including a wayfinding master plan for the area and a parking management strategy to more efficiently use existing parking resources
- Infrastructure improvements - including Coos Waterfront Walkway, improved pedestrian/bicycle crossings of US 101, street/traffic reconfiguration, and access/intersection improvements (removal, consolidation, or relocation of driveways in conjunction with sidewalk and roadway improvements)


## Project Relevance: Transportation-related improvements recommended in the

 Front Street Action Plan will be reviewed and considered for inclusion in the updated Coos Bay TSP.
## Coos Bay Park Master Plan (2013)

The Coos Bay Park Master Plan addresses all the parks within Coos Bay, based on their typology (active, passive, special use, etc.). The plan provides limited detail about the trails and pathways within the city but does establish design guidelines for developing trails and pathways. The plan includes the following Trail and Pathway Design Guidelines:

- Wherever appropriate recreation pathways and trails should not be part of a street roadway.
- Wherever possible trails should be placed on existing public lands, e.g., parks, undeveloped rights-of-way, easements, etc.
- Trail alignments should take into account soil conditions, steep slopes, surface drainage and other physical limitations. Routes should be located for construction and maintenance cost efficiency while taking into account the need to provide a quality experience for the trail user.
- Trails should be developed in compliance with ADAAG guidelines on trail accessibility.
- Trails should be planned, sized, and designed for non-motorized multiple uses except for dedicated nature trails, and/or areas that cannot be developed to the standard necessary to minimize potential user conflicts.
- Centralized and effective staging areas should be provided for trail access. They should include parking, orientation and information signage, and any necessary specialized unloading features. Primary trailheads should also include restrooms and trash receptacles.
- Trail location, connections, and orientation should encourage users to walk or bicycle to the trail. Depending upon the expected and desired level of use, parking may be required at particular trailheads. Secondary trailheads require 3+ parking spaces, whereas primary trailheads may have 20 or more parking spaces.
- Trails should be looped and interconnected when possible to provide a variety of trail lengths and destinations. They should link various parts of the community as well as existing park sites.
- While off-street routes are preferable, some cases trails may be routed on existing streets. In these cases, the pathway should be designed to minimize potential conflicts between motorists and trail users.
- Trails should be developed throughout the community to provide linkages to schools, parks, and other destination points.
- Developers should be encouraged to provide pathways through proposed developments, where such improvements would provide needed linkages between planned trail routes and other public destinations.

The plan states that pedestrian and bicycle access must be considered the primary transportation modes for accessing neighborhood park and recreation facilities. For facilities with larger service areas, public transit and automobiles would also provide access. When possible, new major facilities should be located accessible to transit to minimize traffic impacts and provide equitable access for all city residents. Path or sidewalks and easy walking/biking access are identified as mandatory amenities for neighborhood parks, community parks, and large urban parks. The plan designated these amenities as optional for linear/trail corridors and natural areas.

## Project Relevance: Trail and Pathway Design Guidelines articulate city policy

 regarding the location and function of trails; the guidelines will be reevaluated and reflected in the pedestrian and bicycle elements of the updated TSP.
## North Bend Comprehensive Plan (2017)

The North Bend Comprehensive Plan enacts the State's Land Use Planning Goals, addressing a compliment of urban planning subject areas including recreation and open space, housing, economy, public facilities, and transportation. Goals, policies and implementation strategies in each Comprehensive Plan chapter guide the City's decision-making. Chapter V., Transportation, includes the following Goal and Objectives.

Article 5.4.100-Goal:

Safe, convenient and economic transportation systems that adequately meet the needs of the residents of North Bend and the entire Bay Area.

Article 5.5.100-Objectives:

1. Improvement of regional transportation systems, including improvement and expansion of the North Bend Municipal Airport, the waterborne transportation system, the roadway system and the rail system.
2. Improved access to the City's industrial sites and waterfront.
3. To improve and extend the City's street system and transportation system as a whole in accordance with City standards.
4. Improved access with Coos Bay.

In addition, there are 12 transportation policies (Article 5.6.100) and 11 specific implementation strategies (Article 5.7.100). The Comprehensive Plan document was not updated to reflect the 2004 TSP. While not necessarily inconsistent, Chapter V. guidance language is not identical to the 2004 TSP goals and policies. ${ }^{16}$

Project Relevance: TSPs are adopted as the transportation element of a local Comprehensive Plan; updates to North Bend and Coos Bay TSPs will need to be reflected in the respective comprehensive plans. It is expected that recommendations that result from this planning process will necessitate an update to North Bend Comprehensive Plan Chapter V., Transportation. This will entail referencing the updated TSP or modifying Chapter V. existing background information, goals, policies, and strategies for implementation to be consistent with the updated TSP.

## North Bend Transportation System Plan (2004, Updated 2018)

The North Bend TSP guides the development and management of transportation facilities in the city, reflecting community goals and objectives and providing consistency with state, regional, and local plans. The current plan was adopted in 2004 and underwent minor amendments in 2018 to update street cross-sections (typical design standards). Like the Coos Bay TSP, it is approaching the end of its planning horizon and its update is driven by recent development and planning and the need for safer and more accessible walking and biking facilities, economic development, and mitigation of tourist season transportation system impacts.

A detailed review of the City's existing goals and policies from the North Bend TSP is included in Technical Memorandum \#2, Goals, Objectives, and Evaluation Criteria.

[^15]The TSP establishes standards for access management and street design, recommends multimodal improvements to address the city's transportation needs, and explores potential funding sources to implement these projects.

Project Relevance: The TSP update process will review goals, policies, standards, and recommended projects from the 2004 TSP and 2018 update in determining what remains relevant to include or reflect in the updated TSP. This planning process will update recommended transportation improvement projects for all modes, based on existing and projected needs. Updated data, stakeholder and community involvement, and evaluation criteria will be used in making these recommendations.

## North Bend Development Code

The City of North Bend City Code (NBCC) implements the policies put forth in the North Bend Comprehensive Plan, regulates uses within the city, and establishes standards for development and land divisions. Key existing development standards are summarized below. ${ }^{17}$

## Connectivity and Access Spacing

Block standards are set in subdivision requirements and access ways ("pedestrian ways") through large blocks are allowed for in the code (NBCC 17.24.030). Minimum access spacing standards are established in the 2004 TSP and in code transportation improvements requirements (NBCC 10.12.110). ${ }^{18}$

## Pedestrian and Bicycle Access and Circulation

Pedestrian and bicycle access and circulation are implemented through both required improvements internal to a development site and transportation system (usually roadway design) standards.

- On-site development standards - Pedestrian access and circulation standards are established in the code for all development except single-family detached housing on individual lots or parcels (NBCC Title 10, Article V). The standards include requirements for connections within the development and between the development and the street/ sidewalk.
- Transportation system standards - Minimum roadway design standards are established in the code (NBCC 10.12.130, Table 1). These standards require sidewalks on all functional classifications of streets (major 5-lane arterials, secondary 3-lane arterials, service and industrial streets, collectors, and minor (local) streets) and bike lanes on all streets except local streets. Cross sections (typical minimum street design standards) in the 2004 TSP require bike lanes for arterials and collectors (5-lane, 3-lane, and 2-lane) but not for commercial/industrial streets and

[^16]residential streets. Sidewalks are required on all of these streets, pursuant to both the code and 2004 TSP.

## Vehicle and Bicycle Parking

Off-street parking standards are established in NBCC Chapter 18.68. Vehicle parking standards allow for shared parking when it can be demonstrated that times of parking needs do not "materially" overlap (NBCC 18.68.030.4). Bicycle parking requirements are not established in the code.

## Transportation Impact Studies and Performance Standards

NBCC Chapter 10.12, Transportation Facilities and Improvements, includes requiring a TIS if a proposal "causes traffic impacts that bring a street below acceptable levels of service, or impacts a street that is already operating below acceptable levels of service, or impacts a street that has a documented safety problem (Seciton10.12.070 Mitigation). Transportation impact study (TIS) requirements are set out in Municipal Code Title 10, Article II, and include study thresholds, level of service standards, and mitigation conditions. NBCC 10.12.060 establishes the Level of service (LOS) "D," as defined by the Highway Capacity Manual (2000 Edition) during the p.m. peak hour of the day, for city streets. The level of service standard to determine what is acceptable or unacceptable traffic flow on streets is to be based on a volume to capacity ratio.

## TPR Consistency

Requiring findings related to Statewide Planning Goals (which includes Goal 12, Transportation) is indirectly referred to in the procedures for processing plan and text amendments (NBCC 18.84.020). ${ }^{19}$

## North Bend Engineering Standards

City of North Bend staff reported that the City uses ODOT guidance for local jurisdictions for roadway engineering standards. These including the Highway Design Manual (reviewed in this memorandum and currently under revision), Standard Details and Drawings, 20 and Traffic and Roadway Engineering standards. ${ }^{21}$ The updated TSP will include access management standards and street cross-section design standards. Transportation standards that apply to local roadways also may be adopted into the North Bend Development Code. Alternatively, the City's development standards can be updated to reference the standards in the adopted TSP.

Project Relevance: Performance and design standards recommended as an outcome of the TSP update process will be reviewed for consistency with those the city currently uses for local roadway standards. An intended outcome of this project is to ensure that local standards are consistent between the updated TSP and the required engineering standards.

[^17]
## North Bend Urban Renewal Plan (1994)

The North Bend Urban Renewal Plan was adopted by ordinance by the North Bend City Council in August 1994 to encourage redevelopment and guide infrastructure for that redevelopment in the North Bend area. The intent was for this redevelopment to stimulate economic development by improving the overall conditions of the downtown and waterfront area, which in this document is centered on the intersection of Sherman Avenue (US 101) and California Avenue (see Error! Reference source not found.). Most of the plan is focused on aesthetic improvements or infrastructure improvements that influence aesthetics and public space, including utility undergrounding, upgrading storm drains and sewers, and providing adequate parking. Objectives that apply to the TSP include "provide pedestrian linkages, including sidewalks throughout the area particularly between the waterfront and the downtown."

Renewal projects are listed in phases based on project funding. Pedestrian improvements entail constructing and/or reconstructing all curbs, gutters and sidewalks and installing pedestrian amenities. In conjunction with such reconstruction, the Urban


Figure 7. North Bend Urban Renewal District (Resolution No. 40)

## CITM 1 tose teen CIT NORTH BEND COMPREHENSIVE PLAN MAP

 appropriate trees, planting beds, irrigation systems, period lighting, benches, drinking fountains, trash receptacles and other street furniture items deemed appropriate to establish a comfortable, safe, and pleasant pedestrian environment with a visual consistency throughout.Intersection Improvements include redesigning with appropriate base materials and containment curbs and other traffic calming techniques. Pedestrian paths must be clearly defined.

## Phase 1

- Improved the entrance to Downton area along each end of HWY 101 as part of the Bay Area 101 Corridor Enhancement Project
- Pedestrian Improvements: Sherman Avenue between Washington and Montana and Virginia between Union and the waterfront.

Phase 2

- Pedestrian Improvements: Sheridan between Washington and Connecticut, Washington between Sheridan and the waterfront, and California between Sherman and the waterfront.
- Improve intersections of California and Sheridan and Virginia and Sherman.

Phase 3

- Pedestrian Improvements: Union between Washington and Connecticut, Washington between Sheridan and Union, and Connecticut between Sheridan and Union.
- Improve intersections of Connecticut and Sherman

Phase 4

- Intersection improvements at California and Union
- Redesign Grant Circle to be more attractive

Phase 5

- Simpson Heights Waterfront Access: Pedestrian connections to the area below Simpson Heights
- North Point Access Improvement: Develop a frontage road that provides access to the North Point Industrial area that is sufficient to accommodate industrial traffic.
- Pedestrian Improvements: Virginia Avenue. Redesign to serve as primary East/West pedestrian route between Pony Village, the downtown and the waterfront.
- Pony Creek improvements at the point where it passes under Virginia Avenue.

Phase 1-3 projects were completed with the 2012 Downtown Streetscape improvements and Grant Circle (Phase 4) was completed in 2014.Future amendments to the plan (including adding land to the URA) must be presented to the Urban Renewal Agency or Council with staff and/or North Bend Urban Renewal Advisory Committee recommendations. Minor amendments to the plan must be approved by Resolution of the Renewal Agency. Urban Renewal Agency Resolution No. 40 last modified the plan, which has been amended four times, in 2014. Amendments included adding land to the urban renewal boundary to include land for the construction of a tourist information building. Amendments, as well as the current urban renewal boundary (Urban Renewal Agency Resolution No. 40) can be found on the City's website. ${ }^{22}$

[^18]
# Project Relevance: The North Bend Urban Renewal Plan provides limited improvements to the street network but does identify areas where pedestrian and intersection improvements support the economic and downtown redevelopment efforts within the City. The TSP update process will review and consider recommended improvements that have not yet been completed. 

## Downtown Waterfront District Master Plan (1998)

As a guiding document for the North Bend Urban Renewal Agency, the Downtown Waterfront District Master Plan was created to provide a successful pedestrian centered waterfront area within North Bend. While most of the recommendations within the Master Plan revolve around design and specific building improvements, some transportation improvement projects are listed. Funding is not identified. The plan identifies several civic parks and plazas along the waterfront, including three new community parks (Ellipse Park, Tower Park, and Depot Park), three public docks connected by a waterfront promenade, an RV park, and enhanced landscaping areas. The Waterfront Master Plan was adopted by the City Council in 1998 and has been supported by each City Council since.

Specific improvement projects include:

- Harborwalk Esplanade after designing and permitting the Harbor Avenue Seawall between Virginia and California St. ${ }^{23}$
- Acquire and develop Railroad Avenue from existing railroad ROW
- Eliminate the Virginia Street entrance on the property (currently state office buildings) fronting on Virginia and Sheridan to create smoother traffic flow; enter and exit from Washington Avenue only.

> Project Relevance: The Waterfront District Master Plan will be considered in the development of the bicycle and pedestrian plans in the updated TSP. Improvement projects along the North Bend Waterfront that have not been completed will be considered for inclusion in the updated TSP.

## North Point Area Master Plan (2017)

The North Point Area Master Plan (NPAMP) provides a framework for the long-term development of the North Point District in North Bend, a large area of undeveloped industrial land (see Figure 8). The city recently adopted amendments to City of North Bend Comprehensive Plan, TSP, and Parks and Recreation Master Plan to incorporate the North Point Area Master Plan. ${ }^{24}$

[^19]Projects are listed in phases, divided up by site:

- Phase 1: Chappell Parkway is extended north to the waterfront, an internal street network provides circulation through the site and street improvements are completed. One or more Highway 101 intersections (Pittum Loop, Ferry Road or Bayview Avenue) are reconfigured to improve safety and circulation. Sidewalks and streetscape improvements provide a safe, pleasant environment for pedestrians and incorporate stormwater treatment. Improved bicycle access, including bike lanes on Highway 101, facilitate safe, multimodal travel to and through the District. A trail along the shoreline extends east from the edge of Site 2 , underneath the McCullough Memorial Bridge, to the Sawmill \& Tribal Trail in Ferry Road Park and continues to the small existing parking area south of the park.
- Phase 2: Chappell Road is improved as it extends west from Site 3; an internal street network provides circulation through the site as street improvements are completed. Sidewalks and streetscape improvements provide a safe, pleasant environment for pedestrians and cyclists while incorporating stormwater treatment. A new rail spur bisects the south half of the site. Along the shoreline, a trail extends west from the connection at the edge of Site 3, runs south along the edge of the site and crosses the rail line before connecting to the Sawmill \& Tribal Trail at Pittum Loop.
- Phase 3: Construction of a street network is unlikely due to the limited development potential. A trail loops around the site, connecting to the Site 2 trail at the bridge and providing access to the fishing amenities at the northwest corner of the District.

Figure 8. North Point Area Master Plan Site Context


NPAMP Table 2, Implementation Matrix, prioritizes the capital projects need to implement the plan, including a number of infrastructure projects. The table includes details about costs, time horizon and funding strategies.

Project Relevance: The NPAMP identifies the phases for an undeveloped section of land within North Bend, with transportation projects tailored to specific sites as envisioned for future development. Phase 1 will have the most development, with Phase 3 being the least likely to develop. The City intends to implement these phases with or without the construction of the pipeline. Transportation projects in the NPAMP will be considered and incorporated into the updated TSP.

## Pony Creek Greenway Concept Plan (1998/1999)

The Pony Creek Greenway Concept Plan was a cooperative effort between the City of North Bend, the North Bend School District, and the National Park Service. The plan presents a concept for developing and managing a greenway corridor along Pony Creek and Pony Slough in North Bend. It establishes numerous goals, including Goal 1, which envisions using the Greenway "for recreation and as a nonmotorized transportation link to other parts of the community." Within this goal are the following objectives:

1. Build a pathway from Newmark Street to Virginia Avenue along Pony Creek.
2. Continue the pathway north from Virginia Avenue along Harrison Street to Pony Slough, up through Simpson Park, to the Simpson/Ferry Road Trail where it connects to Highway 101 at the foot of the McCullough Bridge.
3. Continue the pathway east from Newmark to link with Boynton Park.
4. Continue the pathway west from Newmark to Broadway.
5. Provide directional signs along the pathway.
6. Build turnouts with seating for stopping, resting and viewing of the area.

The plan describes the project as phase III of the City's trail system, completing a 2.25 -mile linkage from the northern-most city limits at the Simpson/Ferry Road Park pathway to the southern-most city limits at Newmark Avenue (see

Figure 9). The resulting 3-mile pathway will become the designated route for the Oregon Coast Bike Route through North Bend. The construction materials for the multi-use pathway are described as a combination of concrete sidewalk, bike lane striping, asphalt paving, a wooden bridge, and elevated boardwalk over wetlands. The plan identifies potential funding sources, including the Oregon State Lottery, Land and Water Conservation Fund, and multiple foundations.

Figure 9. Pony Creek Pathway Project


Project Relevance: Proposed Pony Creek Greenway Concept Plan improvements should be considered for inclusion in the North Bend TSP update. While the plan is mostly focused on environment and education, stated objectives are appropriately considered for updating the bicycle and pedestrian plan elements of the TSP. Funding sources listed in the plan may also be relevant to funding desired transportation improvements.

## Hollering Place Master Plan (2008)

Hollering Place is situated at the junction of Newmark Avenue and Empire Boulevard (Cape Arago Highway). The site is comprised of four lots with a total area of 3.68 acres. The existing zoning is General Commercial for the lots located on the bluff and Urban Water Dependent on the lower lots above the high water line and Development Aquatic below the high water mark. The Oregon Downton Development Association created a market-based master plan for Hollering Place and used community feedback to develop a commercial, residential and educational area along the bluffs. The development would be connected via boardwalks to protect the ecosystem below, but otherwise little assumptions are made to the transportation system. The existing street patterns and access points of Empire Boulevard are assumed to remain, and a vehicle turn-around for the terminus of Newmark Avenue is proposed.

Project Relevance: The potential for a mixed-use development at Hollering Place, as envisioned by the Master Plan, will be considered as part of transportation demand forecasting.

## Jordan Cove Energy Project Traffic Impact Analysis Update (2017)

Jordan Cove Energy Project L.P. proposes to construct a liquefied natural gas export facility on 500 acres of the North Spit across the Coos Bay from the Southwest Oregon Regional Airport. ${ }^{25}$ The Jordan Cove Energy Project (JCEP) TIA was prepared to summarize expected traffic impacts associated with two peak phases of construction (years 2021 and 2022) and operation of the proposed Jordan Cove Liquefied Natural Gas (JCLNG) export terminal (year 2024). The TIA found that construction-related trips would be responsible for failure of two intersections to meet applicable operation standards in the study area if mitigation was not provided. Several mitigation measures were evaluated and the following measures were recommended to mitigate construction impacts:

- US 101 at Trans Pacific Parkway improvements
- Provision of a dedicated eastbound left-turn lane, approximately 600 feet long with 450 feet of queue storage
- Temporary signalization of the intersection
- Transportation Demand Management measures
- Two staggered work shifts with start and end times that distribute the commute trips throughout a two-hour arrival and departure period
- Bussing the majority of the workforce not residing at the workforce housing facility on the North Spit
- Manual flagging at the intersection of Hauser Depot Road at US 101 during the PM hours when the construction workforce is leaving the Myrtlewood Offsite park-and-ride lot

The TIA also recommended that the JCEP enter into development agreements with ODOT, Coos County, and the City of North Bend to create a mechanism for working through situations that may arise during facility construction.

Project Relevance: Transportation improvements proposed in the JCEP TIA should be reflected in the updated North Bend TSP. Note that mitigation measures should only be implemented if triggered by approval of the Jordan

## Pony Village Traffic Impact Analysis (2013)

The Pony Village TIA is a set of findings related to the development of a North Bend commercial development of the same name. The analysis evaluates the operation of the site entrances and the accesses to the Pony Village Mall on Virginia Street along the property frontage and proposes off-site improvement strategies to assist with the impact of the site.

Proposed improvements are:

1. Signalize the proposed access to the site.
2. Restrict the entrance to the mall to Right-In Right-Out only.

[^20]3. Coordinate the new signal with the signalized intersection of Virginia and Harrison St.

Project Relevance: The Pony Village TIA identifies off-site improvements needed for the commercial development site, including traffic signals to regulate traffic to and from the mall. Mitigation includes restricting entrance to the site, as well as adding a new signalized intersection on Virginia and Harrison Street. The proposed improvement should be considered for inclusion in the North Bend TSP Update.

## North Bend Parks and Recreation Master Plan (1999, Revised 2018)

The North Bend Parks and Recreation Master Plan was prepared with the support and assistance of the entire community and elected officials, advisory board members, and staff. It updates and replaces the Parks Element of the City's 1995 Comprehensive Land Use Plan. It is specifically intended to provide a blueprint for the acquisition, development, and redevelopment of parks and recreational facilities in North Bend. The plan provides documentation of existing park and recreation system conditions, identifies locally expressed needs, builds community support to determine the means to meets these needs, and establishes a program to guide funding strategies for improvements.

Transportation-related projects are listed below; some projects include the level of importance, as related to connecting users to a specific park.

- Oak Street Park: Develop canyon trail.
- Boynton Park: Construct stairs from Sherman Avenue to the park and develop trail along south portion of park, to provide safe access to convenience store (high priority). Construct sidewalk to fill gap on Sherman Avenue (high).
- College Park: Construct raised crosswalk across Ash Street to proposed school ballfield complex, SWOCC, and John Topits (Empire Lakes) Park (high).
- Airport Heights Park: Construct sidewalk along and raised crosswalk across Colorado Avenue to provide safe access to adjacent residential neighborhood (low). Construct path connecting to Senior Center (medium). Explore shared parking with new development in airport industrial area (medium).
- Pony Point Walkway: Acquire new access to and along the existing but no longer used Pony Point Walkway, including but not limited to access over and across Pony Slough (high).
- Pony Creek Greenway Project: Construct Pony Creek Greenway Trail from Newmark to the Visitor Information Center in Simpson Park (Funding Source: TEA-21, City match) (high)
- Hillcrest Elementary: Improved internal pedestrian circulation is needed.
- Bangor Elementary: Develop 5-foot wide concrete pedestrian connection at end of Madrona Street to provide neighborhood access to school.
- Roosevelt Elementary: Build trail/stairway to provide access to Highway 101 and Sheridan neighborhood.
- John Topits Park: Secure dedication/easement and build trail from Airport Heights Park west and south to John Topits (Empire Lakes) Park (medium).
- Waterfront-Ferry Connector: Build path connection along Sheridan Avenue from Waterfront Master Plan area to Ferry Road Loop Trail (high).
- Ferry Road Loop: Build loop trail from Ferry Road Park to Bayfront, up McDaniel Street, along Bayview Street, through Winsor Park and back to Ferry Road Park (high).
- North Point Trails: Secure easement and build semi improved Simpson Park-Railroad Bridge trail along railroad right-of-way to railroad bridge (low). Develop a 12 -foot wide multi-use soft trail with stormwater facilities on both sides along the Bayfront, connecting the Sawmill and Tribal Trail near Ferry Road Park to the Chappell Parkway Extension (high). Extend the 12-foot wide trail from the Chappell Parkway Extension to Simpson Park (medium). Develop a loop-trail around the western most part of the North Point area (low).
- On-Street Connections: Connect all off-street path segments via on-street bike lanes and sidewalks, especially along Sherman Avenue, Newmark Street, Colorado Street, Virginia Street, Pony Creek Road, Ash Street, and Highway 101 (high).

Project Relevance: The North Bend Parks and Recreation Master Plan provides recommendations to improve access around the parks and trails in North Bend. Updated TSP pedestrian and bicycle elements, or proposed improvements, should be consistent with these recommendations and with the objectives of the Parks and Recreation Master Plan.

## Oregon International Port of Coos Bay Strategic Business Plan (2015)

The Oregon International Port of Coos Bay Strategic Business Plan was developed to articulate the planning, facility, and capital improvement needs of the Oregon International Port of Coos Bay (Port) over a 20-year planning horizon. The document also updated the Port's vision, mission, and guiding principles. The mission of the Port is "promoting sustainable development that enhances the economy of southwest Oregon and the State."

Project Relevance: The Oregon International Port of Coos Bay Strategic Business Plan provides a list of capital improvements and an action plan for the highpriority projects. Updated TSP projects related to the Port should be consistent with the proposed capital improvements.

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$ 。
VOLUME 2

Technical Memorandum \#2:
Goals, Objectives and Evaluation Criteria

## Goaıs, Objecuves and Evaluatıuı Lilerıa-(Task د.2)

Date: October 30, 2018
To: City of Coos Bay
City of North Bend
Oregon Department of Transportation, Region 3
From: Darci Rudzinski and Shayna Rehberg, Angelo Planning Group
Angela Rogge, PE, David Evans and Associates, Inc.
Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
The cities of Coos Bay and North Bend, in partnership with the Oregon Department of Transportation (ODOT), are updating their respective Transportation System Plans (TSPs) to guide future investments in transportation operations, maintenance, and facilities. Assisting the cities and ODOT with the TSP is the team of consulting firms of David Evans and Associates (DEA) and Angelo Planning Group (APG). This memorandum revisits each city's current TSP's goals and introduces the draft transportation-related goals and objectives that will be used to guide the development of updated TSPs for both jurisdictions. In addition, evaluation criteria are proposed to help prioritize projects developed through this TSP update project.

Evaluation criteria are based on project goals and objectives and provide a method by which to assess and compare the suitability of transportation system alternatives and to prioritize projects, programs, policies, pilot projects, and/or refinement studies to address the communities' identified transportation needs.

Terms applicable to this TSP update project are defined here.
$\left.\begin{array}{|l|l|}\hline \text { Goals } & \begin{array}{l}\text { Broad statements of purpose that reflects community transportation } \\ \text { priorities and provide direction for what a community seeks to achieve } \\ \text { (the 'what' is typically the community's Vision or Mission statement). }\end{array} \\ \text { More specific statements of purpose describing how a community will } \\ \text { achieve its goal (or articulate desired specific outcomes related to the } \\ \text { goal). Objectives should be measurable or quantifiable. }\end{array}\right\}$

## 「-.....n世 TCN!

This section includes the goals and policies as they were written for the current North Bend and Coos Bay TSPs. Transportation goals and policies are found in Chapter 2 of the North Bend TSP and Coos Bay TSPs, which were adopted in 2004. The goals provide context for how these cities had previously established the direction for their future transportation system. A review of these goals and policies indicate that they were created with a focus on the development and maintenance of a multimodal transportation that enhances safety, efficiency, and accessibility to all members of the community. Overall, the 2004 goals remain relevant and can serve as the basis for revised goals and objectives to guide the current TSP update project. The cities also have "action" statements associated with some policies. As used in the current TSPs, the action statements have a similar role as objectives in that they provide direction or articulate specific outcomes related to the associated goal.

Goal \#1: Transportation facilities designed and constructed in a manner to enhance [North Bend/Coos Bay]'s livability and meet federal, state, regional, and local requirements.

## Policies:

a) Maintain the livability of [North Bend/Coos Bay] through proper location and design of transportation facilities.

## Action: ${ }^{1}$

Design streets and highways to respect the characteristics of the surrounding land uses, natural features, and other community amenities.

Recognizing that the magnitude and scale of capital facilities also affect aesthetics and environmental quality, the City will require design plans and impact analyses as specified in the Development Code.
b) Consider noise attenuation in the design, redesign, and reconstruction of arterial streets immediately adjacent to residential development.
c) Protect neighborhoods from excessive through traffic and travel speeds while providing reasonable access to and from residential areas. Build streets to minimize speeding.

## Action:

Develop and maintain street design standards and criteria for neighborhood traffic management for use in new development and existing neighborhoods
d) New commercial and industrial development shall identify traffic plans for residential streets where increased cut-through traffic may occur due to the proposed development.
e) Designate major tourist routes for provisions of enhanced streetscape and directional markings.

## Action:

Develop and maintain tourist route standards on major travel routes.

## Goal \#2: A balanced transportation system.

[^21]
## Policies:

a) Implement [North Bend's/Coos Bay's] public street standards that recognize the multi-purpose nature of the street right-of-way for utility, pedestrian, bicycle, transit, truck, and auto use, and recognize these streets as important to community identity as well as providing a needed service.
b) Develop and provide a safe, complete, attractive, efficient, and accessible system of pedestrian ways and bicycle ways, including bike lanes, shared roadways, multi-use paths, and sidewalks according to the pedestrian and bicycle system maps and the Development Code and Engineering Design Manual and Standard Drawings requirements.
c) Provide connectivity to each area of [North Bend/Coos Bay] for convenient multi-modal access. Ensure pedestrian, bicycle, transit, and vehicle access to waterfront, schools, parks, employment and recreational areas by identifying and developing improvements that address connectivity needs.
d) Develop neighborhood and local connections to provide adequate circulation into and out of neighborhoods.
e) The permanent closure of an existing road in a developed neighborhood to through traffic is not recommended and will be considered by the City only under the following circumstances: as a measure of last resort, when the quality of life in the neighborhood is being severely threatened by excessive traffic volumes or the presence of a traffic safety hazard; or as part of a plan reviewed through the City's land use and/or site development process(es), including capital improvement projects. Planned roads that have not been built in neighborhoods should be retained as indicated in the Local Street System Plan maps.
f) Design arterial and collector streets to accommodate pads for public transit and to provide convenient access to transit stops.

## Action:

Work with Coos County Area Transit (CCAT) to improve transit service, pedestrian facilities leading to transit stop waiting areas, and to make the waiting areas themselves safe, comfortable, and attractive.

## Goal \#3: A safe transportation system.

## Policies:

a) Improve traffic safety through a comprehensive program of engineering, education, and enforcement.
b) Design streets to serve anticipated function and intended uses as determined by the Comprehensive Plan.

## Action:

Maintain a functional classification system that meets the City's needs and respects the needs of other agencies including but not limited to Coos County, and ODOT.
c) Where on-street pedestrian and bicycle facilities cannot reasonably be provided on highways and arterials, identify parallel routes that comply with state and city planning and design standards.
d) Enhance safety by prioritizing and mitigating high collision locations within the City.

## Action:

Work with ODOT and Coos County to periodically review traffic collision information in an effort to systematically identify, prioritize, and remedy safety problems.
e) Designate safe routes from residential areas to schools.

## Action:

The City should work with area schools and the community in developing safe transit, pedestrian, and bicycle routes to schools. Communicate selected safe school route program to community. Improvement projects near schools shall consider school access and safety during project development.
f) Provide satisfactory levels of maintenance to the transportation system in order to preserve user safety, facility aesthetics, and the integrity of the system as a whole.

## Action:

Periodically review pavement maintenance system data to update roadway paving budgets, and prioritize facilities with highest need for services.
g) Maintain access management standards for streets consistent with City, County, and State requirements to reduce conflicts between vehicles and trucks, and between vehicles and bicycles and pedestrians.

## Action:

Preserve the functional integrity of the motor vehicle system by limiting access per City standards.
h) Ensure that adequate access for emergency services vehicles is provided throughout the City.

## Action:

Develop Neighborhood Traffic Management standards based on functional classification to preserve primary response routes.
i) Meet federal and State safety compliance standards for operation, construction, and maintenance of the rail system.
j) Provide safe routing of hazardous materials consistent with federal guidelines, and provide for public involvement in the process.

## Action:

Work with federal agencies, the Public Utility Commission, the Oregon Department of Environmental Quality, public safety providers, and ODOT to assure consistent routes, laws, and regulations for the transport of hazardous materials.

Goal \#4: An efficient transportation system that reduces the number and length of trips, limits congestion, and improves air quality.

## Policies:

a) Support and implement trip reduction strategies developed regionally, including employment, tourist, and recreational trip reduction programs.

## Action:

Continue to implement the following action plan to work toward achieving these targets:

- Encourage development that effectively mixes land uses to reduce vehicle trip generation.
- Develop consistent conditions for land use approval that require future employment related land use developments to agree to reduce peak hour trip making through transportation demand management strategies.
- Implement the bicycle, transit, pedestrian, and motor vehicle master improvement plans [to be developed in this study] to implement a convenient multimodal transportation system.
b) Maintain levels of service consistent with the Oregon Transportation Plan. Reduce traffic congestion and enhance traffic flow through such measures as intersection improvements, intelligent transportation systems, signal synchronization, and other similar measures.


## Action:

Adopt level of service standards that are consistent with State and County standards.
c) Maintain levels of service or minimum performance thresholds identified by responsible service providers for non-roadway facilities including rail, air, and marine activities.

## Action:

Work with Port of Coos Bay, North Bend Municipal Airport, and Central Oregon Railroad to establish appropriate performance thresholds for their respective facilities.
d) Plan land uses to increase opportunities for multi-purpose trips (trip chaining).
e) Require land use approval of proposals for new or improved transportation facilities. The approval process shall identify and consider the project's identified impacts.
f) Support mixed-use development where zoning allows.
g) Work with Coos County Area Transit to encourage the development of transit improvements, improve access and frequency of service, and increase ridership potential and service area.

Goal \#5: Transportation facilities that serve and are accessible to all members of the community.

## Policies:

a) Construct transportation facilities to meet the requirements of the Americans with Disabilities Act.
b) Support Coos County Area Transit and other transit service provider's efforts that respond to the transit and transportation needs of the elderly and disabled.

Goal \#6: Transportation facilities that provide efficient movement of goods and services.

## Policies:

a) Designated arterial streets and highway access are essential for efficient movement of goods. Design these facilities and adjacent land uses to reflect the needs of goods movement.
b) Consider existing railroad and air transportation facilities to be City resources and reflect the needs of these facilities in land use decisions.
c) Develop a freight system that takes advantage of the efficiencies of each transportation mode.

Goal \#7: Implement the transportation plan by working cooperatively with federal, State, regional, and local governments, the private sector, and residents. Create a stable, flexible financial system.

## Policies:

a) Coordinate transportation projects, policy issues, and development actions with all affected governmental units in the area. Key agencies for coordination include: Coos Bay, Port of Coos Bay, Coos County, ODOT, and Coos County Area Transit.
b) Participate in implementing regional transportation, growth management, and air quality improvement policies. Work with agencies to assure adequate funding of transportation facilities to support these policies.
c) Monitor and update the Transportation Element of the Comprehensive Plan so that issues and opportunities are addressed in a timely manner. Maintain a current capital improvement program that establishes the City's construction and improvement priorities, and allocates the appropriate level of funding.
d) Develop and use the street utility fee as an element of an overall funding program to pay for maintenance on the collector and arterial street system.
e) Establish rights-of-way at the time of site development and, where appropriate, officially secure them by dedication of property.
f) Working in partnership with ODOT, and other jurisdictions and agencies, develop a long-range financial strategy to make needed improvements to the transportation system and support operational and maintenance requirements.

## Action:

The financial strategy should consider the appropriate elements such as share of motor vehicle fees, impact fees, property tax levies, and development contributions to balance needs, costs, and revenue. View the process of improving the transportation system as that of a partnership between the public (through fees and taxes) and private sectors (through exactions and conditions of development approval), each of which has appropriate roles in the financing of these improvements to meet present and projected needs.
g) Provide adequate funding for maintenance of the capital investment in transportation facilities.

## Action:

Develop a long-term financing program that provides a stable source of funds to ensure cost effective maintenance of transportation facilities and efficient effective use of public funds.

At the most basic level, a TSP provides a blueprint for all modes of travel: motor vehicle (both personal and freight), bicycle, pedestrian, and transit. It is also an opportunity to build on community values and protect what makes the Bay Area a great place to live, work, and visit. The TSP should support a shared vision to be accessible, equitable, and livable communities.

A TSP's goals and objectives serve as the basis of evaluation criteria to assess multimodal plan options and identify plan priorities. For this update, current goals have been augmented to provide a more complete framework for planning for the cities multi-modal transportation system. Objectives associated with each goal guide the development or update of a TSP. Policies and action items in the existing TSPs largely provided this guidance. For this TSP update project, objectives are proposed that are aligned with project expectations. ${ }^{2}$ Objectives both reflect direction in the adopted TSPs, where still valid, and provide new direction. Topic areas in the proposed objectives that better reflect today's needs include tourism and recreation, health, agency coordination, and strategic investments.

Table 1. Summary of Existing vs. Proposed Goals

| Existing Goal | Proposed Goal |
| :--- | :--- |
| Goal \#1: Transportation facilities designed and <br> constructed in a manner to enhance [North <br> Bend/Coos Bay]'s livability and meet federal, state, <br> regional, and local requirements. | Eliminate and retain topics under proposed goals. |
| Goal \#2: A balanced transportation system. | Goal \#1: Continue development of an interconnected, <br> multimodal transportation network that connects all <br> members of the community to destinations within and <br> beyond the city. |
| Goal \#3: A safe transportation system. | Goal \#2: Provide a transportation system that <br> enhances the safety and security of all transportation <br> modes. |
| Goal \#4: An efficient transportation system that <br> reduces the number and length of trips, limits <br> congestion, and improves air quality. | Goal \#3: Optimize the performance of the <br> transportation system for the efficient movement of <br> people and goods. |
| Goal \#5: Transportation facilities that serve <br> and are accessible to all members of the community. | Goal \#4: Provide an equitable, balanced and <br> connected multi-modal transportation system. |
| Goal \#6: Transportation facilities that provide efficient <br> movement of goods and services. | Goal \#5: Provide a transportation system that <br> supports existing industry and encourages economic <br> development in the city. |
| Goal \#7: Implement the transportation plan by <br> working cooperatively with federal, State, regional, <br> and local governments, the private sector, and <br> residents. Create a stable, flexible financial system. | Goal \#6: Develop and maintain a Transportation <br> System Plan that is consistent with the goals and <br> objectives of the city, Coos County, and the state. |
| Goal \#7: Provide a sustainable transportation system |  |
| through responsible stewardship of financial |  |
| resources. |  |

[^22]The following are the recommended goals and objectives to guide the update of the North Bend and Coos Bay TSPs.

Goal \#1: Continue development of an interconnected, multimodal transportation network that connects all members of the community to destinations within and beyond the city.

## Objectives:

a) Improve, as needed, and retain existing connections between households and schools, parks, transit stops, the waterfront and other essential destinations and recreational areas. Provide a network of arterials, collectors and local streets that are interconnected, appropriately spaced, and reasonably direct in accordance with city and state design standards and the Transportation System Plan.
b) For new development, provide for multi-modal circulation internally on site and externally to adjacent land use and existing and planned multi-modal facilities.
c) Support off roadway walkways and bikeways that help to connect communities, provide options to motorized travel, or promote and support walking and biking tourism.
d) Require sidewalks on all new streets within the Urban Growth Boundary and that these facilities be designed to the standards in the adopted Transportation System Plan.
e) Ensure access to schools, parks, and other activity centers for all members of the community, including children, disabled, low-income, and elderly people.
f) Ensure adequate access to transit facilities and services.
g) Upgrade existing transportation facilities, including retrofitting for American Disability Act (ADA) compliance, and work with public transportation providers to provide services that improve access for all users.
h) Ensure American Disability Act (ADA) compliance for new transportation facility infrastructure.
i) Ensure planned pedestrian throughways are clear of obstacles and obstructions (e.g., utility poles) and continue to identify, and as resources permit, eliminate obstacles and obstructions for existing facilities.

Goal \#2: Provide a transportation system that enhances the safety and security of all transportation modes.

## Objectives:

a) Address existing safety issues at high collision locations and locations with a history of severe vehicle, bicycleand/or pedestrian-related crashes.
b) Manage access to transportation facilities consistent with their applicable classification to reduce and separate conflicts and provide reasonable access to land uses.
c) Improve the safety of rail crossings.
d) Identify and improve safe crossings for vehicles, bicycles and pedestrians across Highway 101 and major arterials.
e) Maintain and enhance lifeline and evacuation routes in coordination with local, regional, state and private entities.
f) Coordinate with law enforcement and emergency service providers to increase public safety and security.
g) Consider neighborhood traffic management strategies to improve safety for pedestrians, bicyclist, and vehicles and where certain techniques may be warranted.
h) Identify and designate routes to and around schools that are safe for pedestrians and bicyclists, as well as people in cars and arriving by bus.

Goal \#3: Optimize the performance of the transportation system for the efficient movement of people and goods.

## Objectives:

a) Maintain, and modify as necessary, street functional classifications, along with operational guidance and cross-sectional and right-of-way standards, to ensure streets are able to serve their intended purpose.
b) Reduce reliance on single-occupancy vehicle trips by planning for bicycle and pedestrian facilities that encourage non-vehicular travel and provide safe passage for pedestrians and bicyclists.
c) Reduce reliance on the state system for making local trips by providing a network of arterials, collectors and local streets that are interconnected, appropriately spaced, and reasonably direct in accordance with city and state design standards and the Transportation System Plan.
d) Preserve and maintain the existing transportation system in a state of good repair.
e) Develop a program to systematically implement improvements for all modes that enhance mobility at designated high-priority locations.
f) Adopt a standard for mobility to help maintain a minimum level of freight and/or motor vehicle travel efficiency and by which land use proposals can be evaluated. State and city mobility standards will be supported on facilities under the respective jurisdiction.
g) Work with [North Bend/Coos Bay], Coos County, and ODOT to develop, operate and maintain intelligent transportation systems and technological solutions that reduce travel delay and improve system efficiency, including coordination of traffic signals and improved traveler information.
h) Coordinate with Coos County Area Transit to develop system enhancements that support the movement of people in high traffic corridors.

Goal \#4: Provide an equitable, balanced and connected multi-modal transportation system.

## Objectives:

a) Ensure that the transportation system provides equitable access to underserved and vulnerable populations. Prioritize walking and biking investments in underserved areas with transportation disadvantaged populations.
b) Provide connections for all modes that meet applicable city and Americans with Disabilities Act (ADA) standards.
c) Require multi-modal circulation internal to a development site, as well as connecting to adjacent land use and existing and planned multi-modal facilities.

Goal \#5: Provide a transportation system that supports existing industry and encourages economic development in the city.

## Objectives:

a) Improve the movement of goods and delivery of services throughout the city while balancing the needs of all users with a variety of travel modes and preserving livability in residential areas and established neighborhoods.
b) Prioritize efficient freight movement on identified freight routes and recognize the importance of freight intermodal connectors as the last mile connections between state highways and intermodal freight facilities.
c) Identify lower cost options or provide funding mechanisms for transportation improvements necessary for development to occur.
d) Program transportation improvements to facilitate the development of desired land uses and activities.
e) Encourage recreational tourism by developing connections to and between major recreational locations and destinations and key services in the city.
f) Encourage tourism by promoting and upgrading bicycle and pedestrian recreational routes and services through the city.
g) Designate major tourist routes for provisions of enhanced streetscape and directional markings.
h) Support recreational transit use to boost tourism, enhance economic development, and reduce the environmental impacts of automobile traffic. Explore options to enhance tourist transit use with Coos County Area Transit, including the use of seasonal trolleys, and with businesses that attract tourists, such as local casinos.

Goal \#6: Develop and maintain a Transportation System Plan that is consistent with the goals and objectives of the city, Coos County, and the state.

## Objectives:

a) Ensure consistency with state, regional and local planning rules, regulations, and standards.
b) Coordinate land use, financial, and environmental planning to prioritize strategic transportation investments.
c) Coordinate land use and transportation decisions to efficiently use public infrastructure investments to:

- Maintain the mobility and safety of the roadway system
- Foster efficient development patterns
- Encourage the availability and use of transportation options such as biking, walking and taking transit
- Plan for efficient and safe emergency response and evacuation needs
d) Coordinate with [North Bend/Coos Bay], Coos County, and the Oregon Department of Transportation to implement system management and operations strategies on arterials and highways.
e) Coordinate with Coos County Area Transit to strengthen the efficiency and performance of the transit network and to support the multimodal system.

Goal \#7: Provide a sustainable transportation system through responsible stewardship of financial resources.

## Objectives:

a) Develop and support reasonable alternative mobility targets for motor vehicles that align with economic and physical limitations on state highways and city streets where necessary.
b) Preserve and maintain the existing transportation system assets to extend their useful life.
c) Improve travel reliability and efficiency of existing major travel routes in the city before adding capacity.
d) Pursue grants and collaboration with other agencies to efficiently fund transportation improvements and supporting programs.
e) Identify and maintain stable and diverse revenue sources to meet the need for transportation investments in the city.
f) Identify new and creative funding sources to leverage high priority transportation projects.

Goal \#8: Provide a transportation system that enhances the health of residents and users and that minimizes impacts to the environment.

## Objectives:

a) Identify and seek funding for programs that encourage walking, bicycling, and transit.
b) Provide convenient and direct pedestrian and bicycle facilities and routes to promote health and the physical and social well-being of residents, to reduce vehicular traffic congestion, to provide community and recreational alternatives, and to support local commerce and economic development.
c) Plan for a multi-modal system that limits users' exposure to pollution and that enhances air quality.
d) Consider noise attenuation in the design, redesign, and reconstruction of arterial streets immediately adjacent to residential development.
e) Relate the design of street capacity and improvements to the intended use of the facility.
f) Minimize impacts to the scenic, natural and cultural resources in the city.
g) Avoid or minimize impacts to natural resources, which may include alternative transportation facility designs in constrained areas.
h) Reduce the number of vehicle-miles traveled.
i) Increase the number of walking, bicycling, and transit trips in the city.
j) Develop transportation standards that preserve and protect the integrity of neighborhoods.
k) Support alternative vehicle types by identifying potential electric vehicle plug-in stations and developing implementing code provisions.
I) Evaluate and implement, where cost-effective, environmentally friendly materials and design approaches (water reduction methods to protect waterways, solar infrastructure, impervious materials).
m) Support technology applications that improve travel mobility and safety with less financial and environmental impact than traditional infrastructure projects.
n) Roadways within the city shall be multi-modal or "complete streets," with each street servicing the needs of the various modes of travel.

## ع.--I..-A:

The evaluation criteria will be used to evaluate and prioritize future transportation programs and improvements against the goals and objectives. A broad set of evaluation criteria that represent the proposed set of goals are summarized below.

Table 2. Proposed Evaluation Criteria

| Proposed Goal | Criteria |
| :--- | :--- |
| Goal \#1: Develop an interconnected, <br> multimodal transportation network that <br> connects all members of the community to <br> destinations within and beyond the city. | - Improves or creates access to community destinations <br> - Improves facilities for those using mobility devices |
| - Enhances the active transportation or transit network |  |

## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#3:
Financial Funding Forecast

## TECHNICAL MEMORANDUM \#3

## Financial Funding Forecast - Coos Bay (Task 3.3)

Date: $\quad$ September 7,2018
To: City of Coos Bay Oregon Department of Transportation, Region 3

From: Angela Rogge, PE, David Evans and Associates, Inc. Matt Hartnett, EIT, David Evans and Associates, Inc.

Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
The purpose of this memorandum is to present the transportation funding that is reasonably expected through the 20 -year planning horizon. The information presented will help guide the planning process so that the City and stakeholders have realistic expectations around potential transportation investment options early in the planning process.

## Background and Purpose

Updates of the Coos Bay/North Bend Transportation System Plans (TSP) will guide the future investments in transportation operations, maintenance, and facilities. Each City has its own funding structure and thus separate financial funding forecasts have been prepared.

The recommendations for investments in facilities and services must reflect a plausible estimate of the funding likely to be available. The TSP process will proceed more efficiently if the City and stakeholders have such an estimate before recommending investments.

Exhibit 1 shows how the work on funding fits into the overall work plan for the TSP: it will help the City set goals and objectives, identify and prioritize projects, and set policy to fund the TSP.

Exhibit 1. TSP Update Process


## Key Findings

- Coos Bay's transportation revenues come from two primary sources: State Highway Fund apportionments and a portion of collected PacifiCorp franchise fees. In FY17, Coos Bay received approximately $\$ 990,000$ in State Highway Fund distributions and allocated $\$ 350,000$ in collected franchise fees for street maintenance and improvements.
- Historically, Coos Bay's total transportation revenues have not kept pace with operations, maintenance, and construction costs. The City estimates bringing its streets up to "good" condition would cost at least \$20 Million. The City continues to be proactive in exploring new and additional potential funding sources to address the backlog of deferred maintenance.
- Transportation investments established by House Bill 2017 will effectively increase Coos Bay's State Highway Fund revenues. ODOT projects FY19 State Highway distributions to Coos Bay to total more than \$1.2 Million. By FY40, it is estimated that Coos Bay's annual State Highway Fund receipts will total at least $\$ 1.4$ Million.


## Organization

This memorandum includes three major sections:
Methods Overview: Methods used in this document for forecasting funding.
Funding Sources, Mechanisms, and History: Historical and potential funding sources organized by level of government: Federal, State, and local.

City Transportation Revenue and Expense Estimates: Estimates of current levels of transportation revenues and expenses and forecast of future levels (FY19-FY40).

## Methods Overview

## Levels of Government Funding

Funding for local transportation comes from a mix of federal, state, and local funding mechanisms and programs.

The scope of work for this memorandum is to summarize and analyze existing funding and forecast funding sources. It does not include an evaluation of the performance of funding mechanisms on any other criteria.

## Methods Used in this Analysis

The methods used in this analysis match the purpose described previously. As part of the TSP Update process, the City and ODOT want some assurance that the evaluation of potential investments in facilities and services is done within plausible estimates of the funding likely to be available. To accomplish this, the following are contained in this memorandum:

- A comprehensive list of Federal, State, and local funding sources for transportation operations, maintenance and capital projects in Coos Bay, with a description of how revenues are collected and/or distributed.
- Revenue forecasts to year 2040, the planning horizon of the TSP, for those funding sources that Coos Bay currently employs, and a summary of potential revenues from other funding sources and mechanisms.

To understand current funding levels and estimate future funding levels, DEA has reviewed necessary Federal, State, and local documents.

The assumptions used to develop the revenue forecasts presented in this memorandum are clearly stated throughout. Current trends are used as context for the revenue forecasts estimated in this memorandum, and it should be noted that major changes in trends relating to economics, population, and travel would have a significant impact. Estimates of future revenues and expenses are presented in 2018 dollars.

## Funding Sources, Mechanisms, and History

This memorandum organizes transportation funding sources and mechanisms by the level of government that initially collects the funds: Federal, State and local. For each level of government, this section describes (1) existing funding sources, their current levels, and likely levels over the next 20 years, and (2) new potential funding sources or mechanisms the City of Coos Bay may wish to explore.

Coos Bay currently uses two primary revenue sources to fund transportation system expenses: (1) State Highway Fund apportionments and (2) a portion of collected PacifiCorp franchise fees.

## Federal Funding

## Federal Highway Trust Fund

The Federal Highway Trust Fund is largely sourced by the Federal gas tax ( $\$ 0.184$ per gallon) and is distributed by formula to individual States through the Surface Transportation Block Group (STBG) program. ODOT relies on these distributions to fund many of the safety, highway, and bridge improvement projects identified in the Statewide Transportation Improvement Program (STIP). Any Federal Highway Trust Fund dollars Coos Bay is apportioned are included in the State Highway Fund distributions the City receives.

## Surface Transportation Program (STP) Funds

Made available through FAST Act legislation and administered through and by ODOT, STP funds are flexible and can be used for different types of capital improvements and transportation programs. From FY12 to FY17, Coos Bay received a total of approximately $\$ 450,000$ in STP funds, which was used on street reconstruction and resurfacing projects.

## Federal Enhancement Funds and Other Grants and Programs

Federal Enhancement funds and grants administered by other Federal programs may be made available to cities on a competitive basis and can be used for projects including, but not limited to, capital improvements, multimodal transportation projects, safety improvements, and historic preservation. Other programs include the STBG program, which has set-aside funds for transportation alternatives that can be used for multimodal transportation and community improvement projects, and the Highway Safety Improvement Program (HSIP), which contributes funds for improving safety on public roads. Coos Bay has received approximately $\$ 440,000$ in Federal grant awards from FY12 to FY17.

## State Funding

## City Allocation of the State Highway Fund

The State Highway Fund is comprised of (1) motor vehicle fuel taxes, (2) driver license fees, (3) motor vehicle registration and title fees, and (4) weight-mile tax. The City's share of these revenues is used in Coos Bay to build, operate and maintain the street system and bike and pedestrian paths as well as to provide for transportation engineering and planning support. The State of Oregon allocates the State Highway Fund to cities based on population and counties based on number of registered motor vehicles. The current formula for the State Highway Fund distribution is shown in Table 1.

Table 1. Summary of State Highway Fund Distribution

| Recipient | Percent | Basis for Distribution |
| :--- | :--- | :--- |
| State | $59 \%$ |  |
| Cities | $16 \%$ | Population (ORS 366.764) |
| Counties | $25 \%$ | Vehicle registration in each County (ORS 366.764) |

Coos Bay's portion of the State Highway Fund is based on its population as a share of the total city population in Oregon (16,615 of $2,855,738$ in 2018).

Exhibit 2 shows Coos Bay’s State Highway Fund annual receipts for FY04 to FY18 as reported by ODOT. In FY18, the City's State Highway Fund distributions totaled approximately \$1.05 Million.

Exhibit 2. Coos Bay State Highway Fund Receipts


Coos Bay uses $99 \%$ of its State Highway Fund revenues for street maintenance and operations, including personnel services. The remaining one percent of these apportionments is dedicated by State law to be used for pedestrian and bike improvements.

Over the next 20 years, Coos Bay's State Highway Fund receipts are expected to increase with implementation of House Bill (HB) 2017. The major sources of these increased State Highway Fund revenues include (1) increased motor vehicle fuel tax, and (2) increased registration and title fees.

The tax and fee increases from HB 2017 will be introduced in steps, and three of the four increases in the fuel tax are conditioned on ODOT meeting certain accountability requirements. Table 2 shows the schedule identified in HB 2017 for fuel tax increases.

Table 2. HB 2017 Fuel Tax Increases

| Year | Fuel Tax Increase | Notes |
| :--- | :---: | :--- |
| 2018 | $\$ 0.04 / \mathrm{gal}$ | Implemented |
| 2020 | $\$ 0.02 / \mathrm{gal}$ | Conditional on accountability requirements |
| 2022 | $\$ 0.02 / \mathrm{gal}$ | Conditional on accountability requirements |
| 2024 | $\$ 0.02 / \mathrm{gal}$ | Conditional on accountability requirements |

See ODOT's website ${ }^{1}$ for more detail on accountability requirements.
Given that the two cents per gallon fuel tax increases scheduled for each 2020, 2022, and 2024 are conditional, this memo provides two forecasts of the City of Coos Bay's annual State Highway Fund receipts. One forecast assumes that only the 2018 fuel tax increase takes place, and the other that all three conditional increases take place as well. In this memo, these forecasts are called Case A and Case B, respectively. Exhibit 3 shows forecasts of Coos Bay's annual State Highway Fund receipts to year 2040. The forecasts shown are extrapolated from ODOT's FY18 to FY23 projections for Coos Bay revenues. ${ }^{2}$

[^23]Exhibit 3. Coos Bay State Highway Fund Receipt Forecasts


For FY19 to FY40, Coos Bay's total State Highway Fund apportionments will total $\$ 30.0$ Million and $\$ 32.2$ Million in Case A and Case B, respectively.

## State Transportation Grants

At the State level, a number of programs issue grant funds to local jurisdictions on a competitive basis for a broad range of projects relating to transportation, including, but not limited to, transportation studies, multimodal facilities, and participation in State-sponsored transportation activities. These programs include ODOT's Safe Routes to School and Immediate Opportunity Fund and the Oregon Parks and Recreation Fund. From FY12 to FY17, Coos Bay did not receive any State grant dollars.

## Transportation Growth Management (TGM) Grants

The State also awards TGM grants on a competitive basis. The TGM program is jointly administered through the Department of Land Conservation and Development (DLCD) and ODOT. The City of Coos Bay may use these funds to conduct planning and transportation studies related to managing growth and reducing reliance on single-occupant vehicle (SOV) travel.

## Local Funding Options

This section identifies a broad range of local funding options that the City may wish to pursue in order to secure more revenue for transportation capital projects and operations and maintenance. This section (1) provides an overview of those local funding strategies that Coos Bay already employs for transportation expenditures, and (2) discusses potential additional sources of local transportation revenues.

## Implemented Local Funding Mechanisms

## Franchise Fees

Coos Bay continues to collect franchise fees from public utility and service providers that use the public right-of-way to convey their services, as summarized in Table 3. The City assesses a 9\% fee on PacifiCorp. Approximately $22 \%$ of collected PacifiCorp fees are allocated to the Street Improvement Fund, and the remainder is deposited into the City's general fund. Franchise fees collected from other providers and services are also deposited into the general fund. In FY17, Coos Bay's total annual Franchise Fee revenues totaled $\$ 2.1$ Million.

Table 3. Franchise Fees Collected in Coos Bay

| Franchise/Service | Current Fee $^{\text {a }}$ |
| :--- | :--- |
| Mobilite Telecommunications | $7 \%$ |
| Charter Communications | $5 \%$ |
| PacifiCorp | $9 \%$ |
| Lightspeed Fiber | $7 \%$ |
| Northwest Natural Gas | $5 \%$ |
| SAH Cable | $\$ 200 / \mathrm{yr}^{\mathrm{b}}$ |
| Solid Waste | $5 \%$ |
| Telecommunications Fiber | $5 \%$ |
| Telephone | $7 \%$ |

${ }^{\text {a }}$ All fees are a percentage of annual gross revenue collected by the franchise for all business conducted in City limits ${ }^{\text {b }}$ Increasing 3\% each year the Franchise Agreement remains in effect

## Local Improvement Districts (LIDs)

This mechanism allows neighboring property owners to group together in order to improve public facilities, paying for them over time through individual assessments. LIDs are generally used to complete local street improvements, sidewalk improvements, or improvements to business districts.

Coos Bay has two designated LIDs: $22^{\text {nd }}$ Street and Minnesota Ave. The City has a Special Improvement (LID) Fund, which it uses for sewer, storm water, and street maintenance and improvements. Recently, most spending from this fund has provided for pavement maintenance and repair.

## Tax Increment Financing (TIF)

TIF is a public financing method used to subsidize redevelopment, infrastructure, and other communityimprovement projects. Through use of TIF, a city can divert future property tax revenue increases from a defined area or district (typically termed an urban renewal district) and apply those revenues toward an economic development project or public improvement project in the community.

Coos Bay maintains an Urban Renewal Fund, monies from which are earmarked for capital streetscape improvements in the Downtown and Empire areas. A Downtown Urban Renewal District Special Levy exercised in FY 18 is expected to generate about $\$ 265,000$ in funds to be used for capital projects.

## Jurisdictional Exchange Fund

In 2000, Coos Bay assumed ownership of 23 lane miles of formerly State owned and operated roadways along with $\$ 4.8$ Million to maintain these roads in perpetuity. Coos Bay City Charter dictates that only the interest collected on the monies in this fund can be used for maintenance if the jurisdictional exchange streets or debt service on road maintenance projects. Those streets involved in this transfer include parts of all of the following: Newmark Avenue, Empire Boulevard, Ocean Boulevard, Central Avenue, Commercial Avenue, Anderson Avenue, $6^{\text {th }}$ Avenue, D Street, and Coos River Road.

In recent years, incomes from interest have been very small, and available revenues have been used to pay debt service for the Ocean Boulevard project. In FY19, it is expected the debt for the Ocean Boulevard project will be fully repaid. With the payment of this debt and increasing interest rates, the City anticipates being able to have more resources that are available in this fund in the upcoming years to be used on maintenance of the jurisdictional exchange streets.

## Potential Additional Local Funding Mechanisms <br> Transportation Utility Fees

Transportation utility fees are charges levied on developed properties and/or residents within a city. Revenues from these fees are used to maintain local streets and transportation facilities.

## Local Fuel Tax

Over two dozen Oregon cities and counties have adopted local fuel taxes, ranging from one ( $\$ 0.01$ ) to ten ( $\$ 0.10$ ) cents per gallon. Distributors of fuel within the city limits pay these taxes to the city monthly. A summary of Oregon cities and counties that collect a local fuel tax is provided in Table 4.

In November 2016, voters in both Coos Bay and North Bend defeated a measure proposing a local fuel tax dedicated to street improvement and maintenance. Leadership in the two cities jointly proposed the measure and conditioned its approval on it passing in both communities.

City officials are interested in reengaging citizens on a local fuel tax. In order to build broader political support for a new measure, Coos Bay and North Bend may want to consider a local fuel tax that is only levied during the summer months, when the area experiences higher visitor volumes. As Table 4 demonstrates, the cities of Newport and Reedsport levy seasonally adjusted local fuel taxes.

Table 4. Oregon Cities and Counties with Local Gas Tax

| Cities | Jurisdiction | Local Tax | State | Federal | Total Tax | Administered by |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Astoria | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Canby | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Coburg | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Coquille | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Cottage Grove | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Dundee | \$0.02 | \$0.30 | \$0.18 | \$0.50 | City |
|  | Eugene | \$0.05 | \$0.30 | \$0.18 | \$0.53 | ODOT FTG |
|  | Happy Valley | \$0.02 | \$0.30 | \$0.18 | \$0.50 | City |
|  | Hood River | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Milwaukie | \$0.02 | \$0.30 | \$0.18 | \$0.50 | ODOT FTG |
|  | Newport |  |  |  |  |  |
|  | Jun 1 - Oct 31 | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Nov 1 - May 31 | \$0.01 | \$0.30 | \$0.18 | \$0.49 | ODOT FTG |
|  | Oakridge | \$0.03 | \$0.30 | \$0.18 | \$0.51 | City |
|  | Portland | \$0.10 | \$0.30 | \$0.18 | \$0.58 | ODOT FTG |
|  | Pendleton | \$0.04 | \$0.30 | \$0.18 | \$0.52 | City |
|  | Reedsport |  |  |  |  |  |
|  | May 1-Oct 31 | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Nov 1-Apr 30 | \$0.00 | \$0.30 | \$0.18 | \$0.48 | ODOT FTG |
|  | Sandy | \$0.02 | \$0.30 | \$0.18 | \$0.50 | City |
|  | Sisters | \$0.03 | \$0.30 | \$0.18 | \$0.51 | City |
|  | Springfield | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOTFTG |
|  | Stanfield | \$0.01 | \$0.30 | \$0.18 | \$0.49 | City |
|  | The Dalles | \$0.03 | \$0.30 | \$0.18 | \$0.51 | City |
|  | Tillamook | \$0.02 | \$0.30 | \$0.18 | \$0.50 | City |
|  | Tigard | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOTFTG |
|  | Troutdale | \$0.02 | \$0.30 | \$0.18 | \$0.50 | ODOT FTG |
|  | Veneta | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOTFTG |
|  | Warrenton | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Woodburn | \$0.01 | \$0.30 | \$0.18 | \$0.49 | ODOTFTG |
| Counties | Multnomah | \$0.03 | \$0.30 | \$0.18 | \$0.51 | ODOT FTG |
|  | Washington | \$0.01 | \$0.30 | \$0.18 | \$0.49 | ODOTFTG |

## Transportation System Development Charges (SDCs)

SDCs are collections from developers as new development occurs in the City. These charges are commonly based on trip generation rates associated with different type of development. Where implemented, SDC revenues are typically earmarked for transportation improvements related to the new development.

Coos Bay established SDCs in 2006, but placed a moratorium on them in 2008. The City has approximately $\$ 15,000$ remaining in its Transportation SDC Fund from the period during which it levied
these charges. Reversing this moratorium and reinstituting SDCs could bolster Coos Bay's ability to expand its transportation network, particularly in higher growth areas.

## Parking District Assessment

Parking district assessments are taxes levied on property owners in parking districts in order to provide for the operation and maintenance of parking facilities. Coos Bay is interested in exploring this strategy. Currently, resources from the City's State Gas Tax and Street Improvement Funds are used to operate and maintain public parking infrastructure.

## Development Exactions

To provide adequate infrastructure in response to site-specific growth, capital improvements can be exacted as conditions of approval for building permits, subdivisions, and zoning actions. Developers may be required to complete frontage street improvements and other off-site transportation improvements to mitigate traffic impacts. Exactions are to be related to the project's measured impact on the infrastructure, known as "rational nexus".

## General Obligation Bonds

Bonds are a funding mechanism for constructing capital improvement projects in the City. Voterapproved bonds are sold to fund street improvement projects. Transportation projects are usually grouped in "bond packages" that go before the public for voter approval. Voter-approved General Obligation Bonds are then supported through the City's property tax base.

Coos Bay has one general obligation bond at present - its 2009 fire station bond.

## City General Fund Revenues

To secure more funding to build, operate, and maintain transportation facilities, the City may choose to use general property tax dollars or an increasing share of other General Fund revenues. Using this strategy, however, places transportation system funding in direct competition with other City services that may be already obligated, such as police, fire, libraries, and parks.

## Other Local Funding Mechanisms

There are several other local taxes and fees that Oregon cities may consider in funding transportation capital and operations. These include, but are not limited to hotel/motel tax, employer payroll tax, and parking in-lieu fees.

## City Transportation Revenue and Expense Estimates

## Current Estimate of Revenues

In FY17, Coos Bay collected approximately $\$ 990,000$ in State Highway Fund apportionments. Ninety-nine percent of these dollars is allocated to the City's Gas Tax Fund, and the remaining one percent to the City's Bike/Pedestrian Path Fund.

Coos Bay also dedicates a portion of its PacifiCorp franchise fee revenues to its Street Improvement Fund to be used for operations, maintenance, and capital improvements. In FY17, approximately $\$ 350,000$ in PacifiCorp franchise fee revenues were allocated into the Street Improvement Fund.

While the State Highway Fund apportionments and PacifiCorp franchise fees noted above represent the majority of Coos Bay's transportation revenues, the City raises additional monies from a number of miscellaneous sources, including collected interest and payments for services.

Also, over the six years from FY12 to FY17, Coos Bay received approximately $\$ 890,000$ in Federal grant awards and STP funds for select capital improvement projects.

Table 5 shows Coos Bay's average annual revenues for FY12 to FY17.
Table 5. Coos Bay Average Annual Transportation Revenues (FY12 to FY17)

| Revenues | Annual Average |
| :--- | ---: |
| STATE GAS TAX FUND |  |
| State Highway Fund | $\$ 920,195$ |
| Federal Grants | $\$ 3,949$ |
| Miscellaneous | $\$ 37,336$ |
| TOTAL | $\$ 961,479$ |
| STREET IMPROVEMENT FUND | $\$ 69,814$ |
| Federal Grants | $\$ 74,639$ |
| STP Funds | $\$ 321,091$ |
| PacifiCorp Franchise Fees* | $\$ 3,909$ |
| Miscellaneous | $\$ 469,454$ |
| TOTAL | $\$ 7,829$ |
| BIKE/PED PATH FUND | $\$ 233$ |
| State Highway Fund | $\mathbf{\$ 8 , 0 6 1}$ |
| Miscellaneous | $\mathbf{\$ 4 0 , 0 6 3}$ |
| TOTAL | $\mathbf{\$ 1 , 4 7 9 , 0 5 7}$ |
| OTHER MISCELLANEOUS REVENUES |  |
| TOTAL |  |

*Average for FY16 and FY17

From FY12 to FY17, Coos Bay collected an average of approximately \$1.3 Million annually in local revenues. Over the same period, Coos Bay's Federal grant awards and STP fund receipts averaged about $\$ 145,000$ per year.

Exhibit 4 summarizes the City's local transportation revenues from FY12 to FY17.

## Exhibit 4. Coos Bay Local Transportation Revenues



In FY17, the City's local transportation revenues totaled around \$1.4 Million. Coos Bay's primary transportation funding sources, State Highway Fund apportionments and PacifiCorp franchise fee revenues, accounted for $93 \%$ of this $\$ 1.4$ Million.

## Current Estimate of Expenses

Table 6 shows Coos Bay's average annual transportation expenses for FY12 to FY17.
Table 6. Coos Bay Average Annual Transportation Expenses (FY12 to FY17)

| Expenses | Annual Average |
| :--- | ---: |
| OPERATIONS AND MAINTENANCE |  |
| $\quad$ Personnel Services | $\$ 359,748$ |
| Materials and Services | $\$ 618,890$ |
| $\quad$ TOTAL | $\$ 978,637$ |
| CAPITAL OUTLAY | $\mathbf{\$ 1 7 5 , 2 1 9}$ |
| $\quad$ TOTAL | $\mathbf{\$ 6 4 , 4 1 2}$ |
| DEBT SERVICE | $\mathbf{\$ 1 , 2 1 8 , 2 6 8}$ |

From FY12 to FY17, Coos Bay's total transportation expenses totaled approximately \$1.2 Million annually. Exhibit 5 summarizes the City's transportation expenses for FY12 to FY17.

Exhibit 5. Coos Bay Transportation Expenses FY12 to FY17


## Future Transportation Revenues and Expenses: FY19-FY40

The City's estimated, future transportation revenues and expenses are summarized in Exhibit 6.
Exhibit 6. Future Transportation Revenue and Expense Estimates, FY19-FY40
City of Coos Bay
Revenue (Case A) FY19-FY40

| St Hwy Fund - Allocated to City | $\$ 30,001,000$ |
| :--- | ---: |
| Franchise Fees | $\$ 8,800,000$ |


| Total | \$38,801,000 |
| :---: | :---: |
| Revenue (Case B) | FY19-FY40 |
| St Hwy Fund - Allocated to City | \$32,230,000 |
| Franchise Fees | \$8,800,000 |
| Total | \$41,030,000 |
| Expense | FY19-FY40 |
| Operations and Maintenance | \$22,000,000 |
| Capital | \$4,400,000 |
| Total | \$26,400,000 |

Source: ODOT and City of Coos Bay
All Figures in 2018 dollars.

## Assumptions

State Highway Fund apportionments - Assumes ODOT projections of both base levels and HB 2017 levels, through FY23, and then a constant annual growth rate applied to base levels consistent with that for ODOT's projections for FY18-FY23: about $0.3 \%$. For HB 2017 levels, ODOT's projections are assumed for FY18-FY23. In Case A, HB 2017 revenues are assumed to trend with base revenues: at a constant annual growth rate of about $0.3 \%$. In Case B, HB 2017 revenues are assumed to grow roughly $4.5 \%$ per year for FY24 and FY25, and then to grow at a constant annual growth rate of about $0.3 \%$. Does not account for variation in future population growth rates of Coos Bay relative to other Oregon cities, nor other factors affecting fuel tax revenues (including trends relating to Vehicle Miles Traveled and fuel economy as well as broader economic trends).

Franchise Fees - Assumes constant annual revenues of \$400,000 through 2040.
Operations and Maintenance - Assumes constant annual expenses of \$1.0 Million through 2040.
Capital - Assumes constant annual expenses of $\$ 200,000$ through 2040.

Assuming the continuation of ODOT projected trends for the City's State Highway Fund revenues and consistent levels in franchise fees out to 2040, Coos Bay's transportation revenues will total approximately $\$ 38.8$ Million for FY19 to FY40 in the event that only the four cents per gallon, 2018 fuel tax increase specified in HB 2017 takes place. In the event that all three of the 2020, 2022, and 2024 conditional increases are approved, it is estimated that Coos Bay will receive an additional \$2.2 Million in State Highway Fund apportionments from FY19 to FY40.

Coos Bay continues to be proactive in examining and pursuing other funding sources for transportation operations and maintenance and capital. The above estimates do not include revenues from any of the many strategies for which the City has discussed opportunities for implementation in the future. Receipt of grant awards and STP funds could also facilitate the completion of major capital improvement projects, however these monies are not assumed here.

The transportation expenses shown in Exhibit 6 are assumed consistent with average levels for FY12 to FY17. If Coos Bay continues its funding levels for street maintenance, the City will have roughly $\$ 12$ to $\$ 14$ Million available for capital projects over the next 22 years. Alternatively, Coos Bay could increase its level of maintenance spending and dedicate the remaining revenues to capital projects.

## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#4:
System Inventory

## Technical Memorandum \#4

## System Inventory (Task 4.4)

Date: January 11, 2019
To: City of Coos Bay
City of North Bend
Oregon Department of Transportation, Region 3
From: Angela Rogge, PE, and Matt Hartnett, EIT, David Evans and Associates, Inc. Darci Rudzinski and Shayna Rehberg, Angelo Planning Group
Brooke Jordan and Drew DeVitis, Jacobs
Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
This memorandum updates the existing transportation system inventory provided in the City of Coos Bay and City of North Bend's current 2004 Transportation System Plans (TSPs). In addition to review of the various modal networks, the inventory includes elements that influence the transportation system, such as land use, population and environmental conditions.

The information summarized in this memorandum is intended to provide a baseline for informing and identifying opportunities and constraints of the current transportation system.

## Existing Land Use and Population Inventory

The following is a summary of the permitted land uses in the cities of Coos Bay and North Bend and the associated requirements that govern development and redevelopment. This overview is intended to provide an indication of the type and intensity of land uses that can be expected within the planning horizon, which in turn will have an impact on future traffic generation. The number of trips specific uses generate, and where those uses are located within the community, will have a bearing on planning for appropriate types of transportation solutions. A generalized land use map (Figure 1) shows the location of land uses for both cities.

The urban growth boundary (UGB) for both cities largely coincides with city limits, with some undevelopable water and wetland areas shown outside city limits, but within the UGB.

In North Bend, the land zoned as Airport occupies the bulk of the northern portion of the city. The majority of land in North Bend is zoned as some form of residential, commercial or industrial.

In Coos Bay, the Coos Bay watershed occupies the majority of land in the south of the city. Public and institutional uses occupy significant land in Coos Bay, which is the home to Southwestern Oregon Community College and Bay Area Hospital. Areas of both medium-density residential and industrial land remain undeveloped in Coos Bay.

Both the cities' land use designations are described in more detail in the following sections.



Figure 1. Land Use Summary

## Comprehensive Plan and Zoning Designations

The Comprehensive Plan provides a long-term guide for where and how future development will occur. Comprehensive Plan land use designations inform which zoning districts can be applied to an area. The following describes the land use designations in North Bend and Coos Bay.

## North Bend

## Comprehensive Plan Designations

As shown on Figure 2, there are four principal Comprehensive Plan map designations mapped within the existing North Bend UGB: Airport, Commercial, Manufacturing, and Residential. ${ }^{1}$ The northern part of the City is designated for airport uses and is the location of the Southwest Oregon Regional Airport. To the east of the airport, land is designated for manufacturing. Commercially designated land is centered at the intersection of Newmark Avenue and Broadway Avenue and is found along Broadway Avenue and Virginia Avenue. The remainder of the City is designated residential.

## Zoning

Figure 3 shows the zoning districts within North Bend city limits. The City's Zoning Ordinance, Title 18 of the Municipal Code, lists allowed uses for each of the City's thirteen zones and includes associated development regulations. Allowed uses and development regulations for each of the City's zones are summarized in Table 1.

The City's zoning is informed by the Comprehensive Plan designations; in the case of residential, commercial and manufacturing, multiple zones implement a single land use designation. Within the existing city limits, zoning is largely consistent with the Comprehensive Plan designations. Land is zoned for commercial uses along major streets and the waterfront, industrial zoning is focused in areas along the waterfront and near the airport, and residential uses are dispersed throughout the City.

## Overlay Zones

The North Bend Airport Overlay Zone requires notice to Coos County Airport District and the Department of Aviation regarding land use applications and regulates aspects of development that may have an impact on airport operations (height, noise, pollution, etc.). The airport elevation, the airport noise impact boundary, and the location and dimensions of the runway, primary surface, runway protection zone, approach surface, horizontal surface, conical surface and transitional surface is delineated for the airport by the most current and approved North Bend Municipal Airport master plan and airport layout plan. All lands, waters and airspace, or portions thereof that are located within these boundaries or surfaces are subject to the requirements of the overlay. ${ }^{2}$

In addition to City zoning, North Bend is under the jurisdiction of the Coos Bay Estuary Management Plan (CBEMP), which limits uses and activities on the land and in the water to emphasize conservation or preservation of natural resources. Recreational opportunities are allowed either outright or conditionally, but vary between high/low intensity and if they allow access to the waterway.

[^24]The City of North Bend is also subject to the Federal Emergency Management Area and National Flood Insurance Program (FEMA and NFIP) regulations.

Table 1. Land Use and Zoning Designations for City of North Bend

| Zoning District | Zoning District Purpose |
| :--- | :--- |
| Airport Zone (A-Z) | Allows airport and airport related uses and uses permitted outright <br> in Light Industrial zones (M-L). |
| Residential Zones (R-10, R-7) | Permitted outright: Raising of flowers, fruits and vegetables, not <br> including retail sale, single-family dwellings, parks and open spaces <br> (designated as such by either public or private owners of the land), <br> single-family manufactured homes (subject to specific restrictions) |
|  | Conditional uses: Church, governmental structures or use, <br> multifamily dwellings (Chapter 18.64 NBCC), School, utility <br> substation or pumping station, neighborhood grocery store, off- <br> street parking for adjacent commercial uses, reconstruction or <br> repair of existing non-conforming use. |
| Residential Zones (R-6 and R-5) | Permitted outright: A use permitted outright in an R-7 zone and <br> two-family dwellings. |
| Residential Zone (R-M) | Conditional uses: A conditional use permitted in an R-7 zone, and <br> what is commonly known as a "bed and breakfast". |
| Residential Zone (R-T) | Permitted outright: Allows multifamily dwellings and uses allowed <br> in the R-6 Zones (low density residential and support buildings). <br> Conditional uses: A conditional use permitted in an R-6 zone, <br> boarding, lodging or rooming house, and manufactured home park. |
|  | The uses permitted outright and conditional uses an shall be the <br> same as those provided in the R-5 residential zone. On a conditional <br> use basis, low volume traffic generating commercial uses are <br> permitted (subject to review). |
| Limited Commercial Zone (C-L) | Permitted outright: Business and professional offices, retail sales, <br> service or repair, places of public or private assembly or <br> amusement, their accessory uses, and residential uses (ground <br> floor, street facing restricted). |
| feneral Commercial (C-G) and | Conditional uses: Reconstruction or repair of an existing non- |
| Central Commercial (C-C) | Penforming use, use permitted outright in the R-M zone, church, <br> day nursery, utility substation or pumping station and <br> governmental use or structure. <br> and services and residential uses (ground floor, street facing <br> restricted). |
|  | Conditional uses: Improvements to a preexisting, nonconforming <br> use, manufacturing, fabricating or processing of materials or <br> substance for retail sale, and utility substations or pumping <br> stations. |


| Zoning District | Zoning District Purpose |
| :--- | :--- |
| Light Industrial Zone (M-L) | Permitted outright: Wholesale supply, utility operations and <br> facilities, warehousing, compounding, packaging, processing, <br> repairing, fabricating, marshalling, shipping, light manufacturing, <br> and servicing of materials, equipment, supplies and other personal <br> property, and other compatible uses having similar impacts on <br> traffic and surrounding or adjoining properties. |
|  | Conditional uses: Governmental structure or use, a use permitted <br> outright in the C-G zone, improvement of an existing dwelling <br> requiring a building permit, areas for the accommodation of <br> recreational vehicles and/or trailers (RV parks or travel parks). |
| Heavy Industrial Zone (M-H)Permitted outright: M-L permitted uses and manufacturing, <br> repairing, compounding, fabricating, processing, packing or storage. |  |
|  | Conditional uses: Governmental structure or use, junk <br> yard/automobile wrecking yard, the retail sale of items <br> manufactured, compounded, fabricated, process or assembled on <br> the premises, areas for the accommodation of recreational vehicles <br> and/or house trailers, temporary work force housing. |
| Floodplain Zone (F-P) | Protects areas of special flood hazard identified by the <br> Federal Insurance Administration |

Source: North Bend City Code Chapter 18.08, Revised November 2013.

Coos Bay/North Bend TSP


Urban Growth Boundary (UGB)
Plan Designations

| $\square$ | Airport |
| :--- | :--- |
| $\square$ | Commercial |
| $\square$ | Manufacturing |
| $\square$ | Residential |



Data Sources:
Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

Coos Bay/North Bend TSP


Figure 3. North Bend Zoning Designations

## Coos Bay

## Comprehensive Plan

As shown in Figure 4, Coos Bay has eight principal Comprehensive Plan map designations: Low Density Residential, High Density Residential, Commercial, Industrial, Medical Park, Quasi-public, Planned Industrial, and Reserved for Future Planning. The Coos Bay Estuary Management Plan covers an area east of the Bay. The Upper Pony Creek Reservoir dominates the southwest corner of the City and surrounding areas, which are designated Quasi-public. North and west of the Reservoir and along the waterfront and Cape Argo Highway are areas designated for industrial. The commercial designation is concentrated in areas along transportation corridors, including Newmark Avenue, Ocean Boulevard, Bayshore Drive, and, in the easternmost part of the City, along 6 ${ }^{\text {th }}$ Avenue and D Street. High Density Residential areas are located near these commercial corridors and in the southeast. Along the border of North Bend is the Medical Park, surrounded by Low Density Residential to the east and High Density to the west. Areas of Low Density also lie in the western part of the City, near Madison Elementary School and the cemetery. The southeastern corner of Coos Bay is reserved for future development or planned industrial area.

## Zoning

Coos Bay zoning districts are shown on Figure 5. The Coos Bay Development Code, Title 19 of the Municipal Code, includes Section 2, Zoning. This section describes how the City's zones relate to the Comprehensive Plan classifications (Table 17.210.010) and includes the allowed uses and associated requirements for each of the zone districts. Allowed uses and development regulations for each of the City's zones are summarized in Table 2.

The City's zoning is informed by the Comprehensive Plan designations; in the case of residential, commercial and industrial, multiple zones implement a single land use designation. Within the existing city limits, zoning is largely consistent with the Comprehensive Plan designations. ${ }^{3}$ Mixed-Use zoning implements the Commercial plan designation and is found predominantly in the downtown. Commercial zoning is located along major streets and the waterfront, industrial uses are on the western edges of the City, and residential uses are dispersed throughout the city.

## Management Areas

The entire eastern half of Coos Bay north and areas along the Marshfield Channel and Deep Draft Navigation Channel are under the Coos Bay Estuary Management Plan. Development Code Chapter 17.370 Estuarine and Costal Shoreland Uses and Activities contains development application requirements and decision criteria. Uses and activities permitted by the Coos Bay Estuary Management Plan are subject to general and special conditions and policies to comply with statewide planning goals and the Coos Bay Estuary Plan. The City of Coos Bay is also subject to the Federal Emergency Management Area and National Flood Insurance Program (FEMA and NFIP) regulations.

[^25]Table 2. Land Use and Zoning Designations for City of Coos Bay

| Zoning District | Zoning District Purpose |
| :---: | :---: |
| Commercial and Mixed-Use Districts (C and MX) | Allowed uses include residential uses above the ground floor, convenience food markets, beauty and barbershops, bakeries and service industries for Commercial and a mix of mutually supporting retail, service, office and medium or high-density residential uses. Higher intensity uses include theaters and recreational facilities (including zoos and amusement rides), vocational schools, educational institutions, public service buildings (city hall, police and fire stations), churches and business services, distribution facilities of less than 25,000 square feet gross floor area. Some retail and service uses are prohibited in the MX zone, including motor vehicle dealers, manufactured home sales, and vehicle towing and service. |
| Low Density Residential (LDR-6, LDR-8.5) | Intended for low-density residential areas and appropriate infill and redevelopment with higher densities close to employment centers and transit corridors. Average lot sizes 6,000 sf and 8,500 sf. Allowed non-residential uses include child care facilities (fewer than 13, permitted outright) and bed and breakfasts and art galleries (permitted conditionally). |
| Medium Density Residential (MDR-16) | Residential uses allowed with a minimum density of 8 units per net acre and a maximum density of 16 units per net acre. Conditional uses include religious assembly, educational service, and assembly buildings. |
| Industrial-Commercial (I-C) | Allowed uses include a variety of industrial uses including manufacturing, wholesale trade, and distribution activities. Commercial and institutional uses include residential living facilities, offices, restaurants (including drive-through), schools, recreation facilities, and public and semi-public buildings and uses. |
| Waterfront Heritage (WH) | The WH district is made up of three zoning sub districts: WH-1, Core Area (bounded by Alder Avenue to the south, US 101/North Bayshore to the west, Date Avenue to the north and the Coos Bay waterway to the east); WH-2, Transition Area (bounded by Commercial Avenue to the south, US 101/North Bayshore to the west, Fir Avenue to the north, and the Coos Bay waterway to the east); WH-3, Central Dock Area (bounded by Fir Avenue on the south, US 101 to the west, Ivy Avenue to the north and the Coos Bay waterway to the east.) <br> For areas lying east of Front Street, including the WH-3 sub district, all commercial, industrial, and civic uses, which are water-dependent or water-related, are permitted as allowed by the Coos Bay Estuary Management Plan. Permitted conditional uses include bus shelters, equipment sales, waterfront inns (WH2 and $\mathrm{WH}-3$ ), manufacturing ( $\mathrm{WH}-3$ ), and horticulture. |


| Zoning District | Zoning District Purpose |
| :--- | :--- |
| Waterfront Industrial (W-I) | Coos Bay Estuary Management Plan controls the allowed uses; <br> permitted uses depend on the mapped Management Unit <br> (Natural, Conservation, and Development). Uses permitted <br> include aquaculture, high-intensity water-dependent recreation, <br> and mining and mineral extraction. There are no minimum lot <br> size, lot coverage, or building height requirements. |
|  | Enables a PUD based on guidelines from Hollering Place Master <br> Plan. Development is divided into two (2) sub districts, HP-1 and |
|  | HP-2. Both areas require development intended for the public. |
| Hollering Place (HP) | HP-1 (upper bluff area): Continuation from the existing Empire |
| business district (dining, retail, offices, visitor information |  |
| services). |  |
|  | HP-2 (lower bench area): commercial, residential, educational |
| and recreational development. |  |

Source: Coos Bay Municipal Code Chapter 17, revised August 2018.
Notes: Code amendments in process: "Accessory Dwelling Unit" may be a permitted use. Proposing to eliminate max lot size restrictions. In the process of amendments that will add all the uses from the Commercial zone and permitted uses in the I-C zone; uses were accidentally left off with the Development Code Rewrite of March 2016.

## Coos Bay/North Bend TSP


U..... Urban Growth Boundary (UGB)

## Plan Designations

$\square$ Commercial
$\square$ IndustrialMedical Park District
$\square$ Residential
$\square$ Urban Public


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online


| (-....... Urban Growth Boundary (UGB) | \#.:. Industrial/Commercial (I-C) |  |
| :---: | :---: | :---: |
| City of Coos Bay Zoning Designations | Hollering Place (HP) | $\Delta$ |
| Low Density Residential (LDR-8.5) | Waterfront Heritage (W-H) | N |
| Low Density Residential (LDR-6) | - Waterfront Industrial (W-I) | $0 \quad 0.5$ |
| Medium Density Residential (MDR-16) | Urban Public (UP) | L $\quad$ Miles |
| Medical Park (MP) | Watershed (W) | Data Sources: |
| Mixed Use (MX) | Trust Land (TL) | Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT), |
| Commercial (C) |  | Oregon Geospatial Enterprise Office, ESRI ArcGIS Online |

## Development Potential

As part of the TSP process, it is important to identify "buildable lands", or areas for potential redevelopment. "Buildable lands" includes both vacant land and developed land likely to be redeveloped (ORS 197.295). A well-connected transportation network is integrated with surrounding land uses and provides safe, multimodal facilities between and within neighborhoods. Knowing where development is likely to occur can aide in planning a transportation network that adequately and efficiently serves the community. Figure 6 summarizes areas identified in both North Bend and Coos Bay.

## North Bend

There are several parcels scattered throughout the City of North Bend that have potential for development. Most of the parcels are currently zoned as residential, but the largest area is in the North Point industrial zone. ${ }^{4}$ As development occurs, new transportation infrastructure may be needed to connect to the existing system.

## Coos Bay

Coos Bay has identified several parcels with potential for development with the zoning spanning nearly all of their designations. The locations with the most area are on the southwestern edge of the existing transportation system. These parcels are zoned residential (low and medium density) and would require new transportation infrastructure with development. There are also areas along the Coos Bay waterfront east of US 101 currently zoned as either waterfront heritage, industrial/commercial or low density residential that would need to be connected to the existing transportation system.

## Population and Demographics

Demographic characteristics usually inform what modes and methods of transportation will most benefit a population. The approximate populations of North Bend and Coos Bay are 9,919 and 16,824, respectively, but like many cities, their populations are not homogenous. The transportation system also is expected to serve more than just its residents, with large numbers of people visiting the Oregon Coast every year.

## Population Inventory

According to Portland State University (PSU) Population Research Center's (PRC) population forecast for the area, North Bend's UGB population is expected to total 10,152 in 2035 and 10,007 in 2065. This represents an average annual growth rate of $0.1 \%$ over the next 17 years, and an average annual growth rate of $-0.1 \%$ over the following 35 years. Coos Bay's Urban Growth Boundary (UGB) population is expected to grow to 18,117 by the year 2035, and to 19,214 by the year 2065. This represents an average annual growth rate $0.4 \%$ over the next 17 years and an average annual growth rate of $0.2 \%$ over the following 30 years. By comparison, the average annual growth rate for Coos County is expected to be $0.0 \%$ (17-year rate) and $-0.2 \%$ (30-year rate).

[^26]Table 3. Coos County Population Projections

| Year | Coos County | North Bend | Coos Bay |
| :---: | :---: | :---: | :---: |
| 2018 | 63,471 | 9,919 | 16,824 |
| 2020 | 63,795 | 9,979 | 17,057 |
| 2025 | 63,895 | 10,095 | 17,543 |
| 2030 | 63,855 | 10,148 | 17,874 |
| 2035 | 63,552 | 10,152 | 18,117 |
| 2040 | 63,066 | 10,126 | 18,301 |
| 2045 | 62,536 | 10,095 | 18,451 |
| 2050 | 62,011 | 10,079 | 18,676 |
| 2055 | 61,490 | 10,079 | 18,994 |
| 2060 | 60,974 | 10,050 | 19,145 |
| 2065 | 60,462 | 10,007 | 19,214 |

Notes:

1. 2018 population totals are based on PSU PRC estimates published June 2018
2. Population Projections for 2020-2040 are based on PSU PRC forecasts published June 2018


Urban Growth Boundary (UGB)
Tsunami Inundation
Y(IIIIA
Potential for Development


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Consistency with 2035/36 Coos Bay/North Bend Travel Demand Model

The Coos Bay/North Bend travel demand model will be used to develop future traffic volumes for the planning horizon. The model relies on socioeconomic data (e.g., households and employment) to determine the travel demand, and system attributes (e.g., roadway capacity, speeds, and distances) to represent the transportation supply. The long-range regional growth forecasts are consistent with current land use zoning.

The travel demand model was last updated in 2015 through a coordinated process with ODOT and staff from the Cities of North Bend and Coos Bay. The model relies on PSU population forecasts and input from the cities on future land use assumptions consistent with the Comprehensive Plans. No major network improvement projects were planned. Only typical improvements such as speed changes, capacity changes, and new signals were integrated into the future model.

## Title VI/Environmental Justice Demographics Overview

To ensure compliance with Oregon Department of Transportation Title VI (1964 Civil Rights Act) Plan guidance and the US Department of Transportation Executive Order 12898 on Environmental Justice, affected groups and protected classes have been inventoried and mapped as part of the Title VI, Environmental and Cultural inventory. A detailed outreach strategy was documented as part of this project in the Title VI/Environmental Justice Outreach Memorandum and includes further breakdown of the population demographics.

Figure 7 through Figure 11 map Title $\mathrm{VI} /$ Environmental Justice populations ${ }^{5}$ for North Bend and Coos Bay:

- Minority Population
- Elderly
- Low Income
- Median Household Income
- Limited English Proficiency

[^27]
## Coos Bay/North Bend TSP



Urban Growth Boundary (UGB)

## Minority Population By Block Group

$\square$ <8\%
8-15\%
15-22\%
$>22 \%$


Data Sources:
Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office, U.S. Census American Community Survey ESRI ArcGIS Online

## Coos Bay/North Bend TSP



Urban Growth Boundary (UGB)

## Population Over 65 By Block Group

< 12\%
12-16\%
16-25\%
> 25\%


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
U.S. Census American Community Survey ESRI ArcGIS Online

Figure 8. Population Over 65

## Coos Bay/North Bend TSP



Low Income Population By Block Group
< $7 \%$
7-16\%
16-25\%
$>25 \%$


Data Sources:
Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office, U.S. Census American Community Survey ESRI ArcGIS Online

Figure 9. Low Income Population

## Coos Bay/North Bend TSP



## Coos Bay/North Bend TSP




Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office, U.S. Census American Community Survey ESRI ArcGIS Online

Figure 11. Limited English Proficiency

## Existing Transportation System Inventory

An inventory of the existing transportation system in Coos Bay and North Bend was conducted as part of the TSP process. This inventory includes the street, pedestrian, bikeway, public transportation, rail, air, water, and pipeline systems within the Urban Growth Boundary (UGB).

## Street System

This section summarizes the existing street network and important characteristics of the study area roadways. Several jurisdictions, including the State (ODOT) and the Cities of Coos Bay and North Bend, maintain portions of the existing street system within the study area. A comprehensive inventory was conducted of all arterial and collector streets within the UGBs of both cities.

## Jurisdiction

The street system within the Cities of Coos Bay and North Bend includes roadways under jurisdiction of the State and both Cities. There are also numerous private streets in the study area. Coos County maintains a single local road within the Coos Bay or North Bend UGBs. Coos County maintains a few roads outside of the UGB that connect to Coos Bay routes (Anderson Lane, Coal Bank Lane, Flanagan Road, Mullen Road and Olive Barber Rd). ${ }^{6}$ Figure 12 shows the location of roads by jurisdictional responsibility within the UGBs.

## Functional Classification

Streets and highways are assigned a classification to indicate purpose, design and function. This functional classification ensures that streets are built and maintained with features that can support demand from both the surrounding land uses and traffic that may be traveling through parts of the city. It also describes how adjacent properties are accessed and how much mobility the street provides, as illustrated below.

Exhibit 1. Functional Classification


Mobility

[^28]
:-..... Urban Growth Boundary (UGB)

## Jurisdiction

- ODOT
- Coos Bay
—— North Bend
- Coos County


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office, ESRI ArcGIS Online

There are five roadway classifications in Coos Bay/North Bend including principal arterial (highway), arterial, collector, neighborhood routes, and local roadways. The classification system facilitates the design and management of the roadway; it allows for safe and efficient travel based on the desired objectives, as described above. The current functional classifications were established in the 2004 TSP Updates and relied heavily on connectivity and adjacent land use. Some changes may be necessary to establish consistency with State and Federal classifications (specifically "Neighborhood Routes").

There is one state highway and two district highways that provide connections throughout the project area: US 101, OR 540 and OR 241, respectively. The district highway, arterials, and major collector routes provide access and circulation throughout the Bay Area and to US 101. Functional classification and other important identifying information is mapped in Figure 13.

General descriptions of the classifications include:
Principal Arterials are typically freeways and state highways that provide the highest level of connectivity. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterials or collectors.

Arterial streets serve to interconnect and support the principal arterial highway system. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets in lieu of a well-placed arterial street.

Collector streets provide both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.

Neighborhood Routes are usually long relative to local streets and provide connectivity to collectors or arterials. Because neighborhood routes have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to get into and out of the neighborhood, but do not serve citywide/large area circulation. They are typically about a quarter to a half-mile in total length. Traffic from cul-de-sacs and other local streets may drain onto neighborhood routes to gain access to collectors or arterials. Because traffic needs are greater than a local street, certain measures should be considered to retain the neighborhood character and livability of these routes.

Neighborhood traffic management measures are often appropriate (including devices such as speed humps, traffic circles and other devices - refer to later section in this chapter). However, it should not be construed that neighborhood routes automatically get speed humps or any other measures. While these routes have special needs, neighborhood traffic management is only one means of retaining neighborhood character and vitality.

Local streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

Roadway ownership and maintenance responsibilities of the various roadways in the study area are carried out by the respective local and county agencies while State routes are under ODOT jurisdiction.



ODOT Functional Classification
—Principal Arterial
— Minor Arterial
City Functional Classification

- Arterial
- Collector
- Neighborhood
- Local


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Access

Access management can be an important tool for protecting the function of roadway. As part of a TSP, access management describes property access conditions that may influence travel along major local transportation corridors. The TSP must also be consistent with designated access management categories in the Oregon Highway Plan (OHP).

There is a common understanding for the need of property owners to maintain roadway access to their businesses and residences. However, a proliferation of driveways and minor street intersections multiplies the number of conflicts along a roadway segment, thus reducing the capacity of intersections, increasing the probability of crashes, and generally degrading service for all system users. Hence, access management must balance the competing needs of compatible land uses, private access, and the function of the transportation system.

ODOT and the Cities of Coos Bay and North Bend have access management standards that apply within their City limits. The access management standards applicable to this study area are summarized in Error! Reference source not found. and Table 5.

Table 4. Existing City Access Spacing Guidelines

| Functional Classification | North Bend $^{1}$ | Coos Bay $^{2}$ |
| :--- | :---: | :---: |
| Arterial | 500 feet | 500 feet |
| Collector | 300 feet | 300 feet |

Source: ${ }^{1}$ Chapter 10.12.110 NBCC; 22004 Coos Bay Transportation System Plan
Table 5. Existing ODOT Access Spacing Standards

| Functional Classification | Posted Speed | Urban Areas Access Spacing Standard |
| :---: | :---: | :---: |
| Statewide Highways <br> (Applicable to US 101) | 25 mph \& lower | 350 feet ${ }^{1}$ |
|  | $30 \mathrm{mph} \& 35 \mathrm{mph}$ | 500 feet ${ }^{1}$ |
|  | $40 \mathrm{mph} \& 45 \mathrm{mph}$ | 800 feet ${ }^{1}$ |
|  | 50 mph | 1,100 feet ${ }^{1}$ |
|  | 55 mph or higher | 1,320 feet ${ }^{1}$ |
| District Highways <br> (Applicable to OR 540 and OR 241) | 25 mph \& lower | 250 feet ${ }^{2}$ |
|  | $30 \mathrm{mph} \& 35 \mathrm{mph}$ | 350 feet ${ }^{2}$ |
|  | $40 \mathrm{mph} \& 45 \mathrm{mph}$ | 500 feet ${ }^{2}$ |
|  | 50 mph | 550 feet ${ }^{2}$ |
|  | 55 mph or higher |  |

## Notes:

1. Table 14 in Appendix C of the OHP Including Amendments November 1999 through May 2015: Access Management Spacing Standards for Statewide Highways with Annual Average Daily Traffic (AADT) of More Than 5,000 Vehicles
2. Table 16 in Appendix C of the OHP Including Amendments November 1999 through May 2015: Access Management Spacing Standards for District Highways with Annual Average Daily Traffic (AADT) of More Than 5,000 Vehicles

An access inventory for roadways within the Coos Bay and North Bend UGBs was not available for inclusion in the report. The 2004 TSPs identified specific segments that could benefit from specific access management plans. North Bend identified Newmark Avenue between Broadway and Fir Street,
as well as Virginia Avenue between US 101 and Harrison. Coos Bay identified the Bayshore Drive/Front Street area.

## Roadway Characteristics

## State Facilities

The study area is served by three state highways (listed in Table 6 and summarized below). Although the Cities have no direct control over the majority of the state highways within its boundaries, the highways influence traffic patterns, tourism and development.

Table 6. State Highway Inventory within Study Area

| No. | Name | State Classification | Other Designation(s) |
| :---: | :---: | :---: | :---: |
| US 101 | Oregon Coast Highway | Statewide | OHP Freight Rt.; Statewide Hwy; NHS; |
|  |  |  | Oregon Scenic Byway |

## US 101

The Coos Bay/North Bend area is bisected by US 101, which serves as the primary through north and south route for traffic traveling through the area. US 101 ranges from a two-lane to five-lane road with posted speed limits ranging from 20 to 45 miles per hour (mph) in the Coos Bay/North Bend area.

## OR 540 (Cape Arago Highway)

Cape Arago Highway serves as a primary means of access to the Empire District of Coos Bay and the Coos County coastal communities of Barview and Charleston. Coos Bay maintains the portion of OR 540 in its City limits and the rest is maintained by ODOT. The ODOT-maintained portion of OR 540 in North Bend is a four-lane road with posted speed limits of 25 to 35 mph .

## OR 241 (Coos River Highway)

Coos River Highway does not intersect any of the study are intersections; however it plays an important role for connectivity, linking the Eastside District of Coos Bay and Allegany. Coos Bay maintains most of the length of OR 241 falling within the UGB, but ODOT maintains short segments of the road within the City's UGB as well. The ODOT-maintained portions of the highway in +the UGBs are both two-lanes, with posted speed limits of 35 and 55 mph , respectively.

## National Highway System Facilities

The National Highway System (NHS) is a network of nationally significant roads. There are a few NHS routes in the study area, as summarized below and noted on Figure 13 (page 25).

- US 101
- OR 540:
- Virginia Ave (Broadway Ave to US 101 northbound)
- Broadway Ave (Virginia Ave to Newmark St)
- Newmark Ave (Broadway Ave to Fir St)
- Newmark Ave (Fir St to Ocean Blvd)
- Sheridan Avenue
- California Avenue (east of US 101 SB)
- Ocean Blvd
- Central Ave (Ocean Blvd to $7^{\text {th }}$ St)
- Commercial Ave ( $7^{\text {th }}$ to US 101 northbound)
- Anderson Ave ( $7^{\text {th }}$ St to US 101 northbound


## Truck Freight

Efficient truck movement plays a vital role in maintaining and developing North Bend and Coos Bay's economic base. Well-planned truck routes can provide for the economical movement of raw materials, finished products and services. Important truck freight information is summarized below and mapped in Figure 14.

## Freight Routes

US 101 is designated as a Freight Route in the Oregon Highway Plan (OHP). Consistent with the State designation, North Bend and Coos Bay's TSPs classify US 101 as a primary truck route, along with other State and local roads within the UGB. The major freight routes proposed by North Bend and Coos Bay's 2004 TSPs include:

- Primary Truck Routes:
- US 101 (North Bend and Coos Bay)
- OR 540 - Cape Arago Hwy (North Bend)
- Newmark Ave (Coos Bay)
- Empire Blvd (Coos Bay)
- Ocean Blvd (Coos Bay)
- Secondary Truck Routes
- Libby Drive (Outside UGB)
- Southwest Blvd (Coos Bay)
- Lockhart Ave (Coos Bay)
- Front St (Coos Bay)


## Highway Over-dimension Load Pinch Points

According to the ODOT Freight Planning Unit, Transportation Development Division's Highway Overdimension Load Pinch Point (HOLPP) study, pinch points include weight-restricted bridges, vertical clearance restrictions, and horizontal constraints, which limit vehicle widths and lengths. Two locations within the North Bend UGB are identified in the HOLPP report as pinch points:

- US 101 MP 233.99, Coos Bay (McCullough) Bridge: Wide/Long Loads and Vertical Clearance pinch point, Low Priority - The bridge has narrow shoulders and raised sidewalks with railings, as well as a vertical clearance of $16^{\prime}-11^{\prime \prime}$ in both directions. It is a historic coast bridge, so no capacity improvements will be made as long as the bridge remains in good condition.
- US 101 MP 236.28, Lewis Street signal head: Vertical Clearance pinch point, High Priority - The signal currently is 4 " below the minimum height requirement for both directions.

The HOLPP also identifies two locations within the Coos Bay UGB as pinch points:

- US 101 MP 238.25, Downtown Coos Bay, Low Priority - Route includes two narrow lanes of traffic in each direction, with on-street parking
- US 101 MP 238.40, Curtis Avenue signal head: Vertical Clearance pinch point, High Priority The signal head clearance is currently $17^{\prime}-0^{\prime \prime}$ in both directions.


## Reduction Review Route

Within both cities, US 101 is also classified as a Reduction Review Route (RRR). An RRR is a facility that is required by ORS 366.215 to be reviewed during all planning, project development, development review, and maintenance projects for "hole in the air" capacity. No changes can be made to the US101 corridor that will permanently reduce capacity in any way unless it is required for safety reasons or an exception is made by the Oregon Transportation Commission.

## Freight Highway Bottlenecks

The Oregon Freight Highway Bottlenecks Project (FHBP) report includes a list of critical delay areas along Oregon freight routes. The report does not highlight any segments within the Coos Bay or North Bend UGBs that cause significant delay or unreliability.

## Intermodal Connectors (Truck and Rail Freight)

Another critical piece of the North Bend and Coos Bay area freight system is the intermodal connector system. The Oregon Freight Intermodal Connector System (OFICS) study defines freight intermodal connectors as "roads that provide the 'last-mile' connection between major rail, port, airport, and intermodal freight facilities" and the state's freight routes. Table 7 summarizes the freight intermodal connectors that are within the North Bend and Coos Bay UGBs.

Table 7. Study Area Intermodal Connectors

| Intermodal <br> Connector ID\#\# | City | Location | Connecting <br> Highway | Intermodal Terminal/Business |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| OR4P_1 | North Bend | California Ave | US 101 | Port of Coos Bay - Ocean Terminals |  |
| OR4P_2 | North Bend | Sheridan Ave | US 101 | Port of Coos Bay - Ocean Terminals |  |
| R3T2A03 | North Bend | E Airport Way <br> W Airport Way <br> Maple Leaf St <br> Maple St <br> Virginia Ave | OR 540 | SW Oregon Regional Airport |  |

Source: https://www.oregon.gov/ODOT/Planning/Documents/2017-OFICS-Inventory-Table.pdf

## Coos Bay/North Bend TSP



[^29]
## Design and Geometric Roadway Data

There are various inventories that describe the design and various features along the street systems of Coos Bay and North Bend. A description and accompanying table or figure are provided in this section.

Speed Limits - Appendix A provides a listing of speed limits for arterials and collectors within the North Bend and Coos Bay UGBs. Speeds on local roads are typically 25 mph or less. Collectors are typically 25 mph . City arterials can range from 25 mph to 35 mph in North Bend and 25 mph to 40 mph in Coos Bay. The principal arterial of US 101 ranges from 20 mph to 45 mph within the UGBs, as shown in Figure 15. Map does not include Coos Bay speed limits because information is not readily available in GIS.

Stop Control Devices - Stop control devices in North Bend and Coos Bay include signalized intersections and stop signs. Their use is intended to increase safety for all users by regulating the flow of traffic. There are numerous signalized and stop controlled intersections in the study area. Figure 15 summarizes the traffic control for only the study area intersections. Appendix B summarizes the stop controlled intersections in North Bend; Coos Bay does not summarize this data.

Structures - An important aspect of a community's transportation system is recognizing the critical role that transportation facilities, particularly bridges, play in emergency response and evacuation. These structures include 10 bridges and 11 cantilever sign structures that are on facilities either within or connecting the City UGBs. Table 8 summarizes the bridge information and Table 9 summarizes the cantilever sign structures (see Figure 15).

Table 8. Study Area Bridge Inventory

| M.P. | Br. \# | Name | Location | ufficiency Rating | Notes |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 233.99 | 01823 | Coos Bay, Hwy 9 (US 101) (McCullough) | North Bend | 49.5 | Functionally obsolete |
| 234.76 | 01950 | Hwy 9 over CBRL (North Bend) | North Bend | 73.6 | Functionally obsolete |
| N/A | $006 T 1$ | Pony Slough, Broadway St | North Bend | 73.5 |  |
| N/A | $006 T 2$ | Pony Slough, Vermont Ave | North Bend | 40 |  |
| 0.42 | 03225A | Pony Creek, Hwy 240 | North Bend | 94.1 |  |
| 239.20 | 02478C | Coalbank Slough, Hwy 9 (US 101) | Coos Bay | 87 |  |
| 1.56 | 03254A | Pony Creek, Ocean Blvd | Coos Bay | - |  |
| 2.19 | 02278E | Catching Slough, Hwy 241 | Coos Bay/Coos County | 74.6 | Functionally obsolete |
| 0.14 | 02390 | Hwy 241 over CBRL | Coos County | 65 | Functionally obsolete |
| 0.42 | 01132F | Isthmus Slough, Hwy 241 (Eastside) | Coos County | 46.7 | Structurally deficient |

Sources: 2017 Bridge Condition Report; ODOT TransGIS

Table 9. Cantilever Sign Structure Inventory

| M.P. | Br. \# | Name | Location | Superstructure Rating | Substructure <br> Rating |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 235.48 | 21670 | Sign Cantilever Br, US 101 NB | North Bend | Very Good | Very Good |
| 235.49 | 21671 | 1-35'6" Sign Cantilever Br, US 101 NB | North Bend | Very Good | Very Good |
| 235.61 | 21672 | 1-36'2" Sign Cantilever Br, US 101 NB | North Bend | Very Good | Very Good |
| 238.20 | 20686 | 1-21' Sign Cantilever Br, US 101 NB | Coos Bay | Satisfactory | Satisfactory |
| 238.25 | 20687 | 1-21' Sign Cantilever Br, US 101 NB | Coos Bay | Fair | Satisfactory |
| 238.32 | 20688 | 1-21' Sign Cantilever Br, US 101 NB | Coos Bay | Satisfactory | Satisfactory |
| 235.15 | 21667 | 1-35' Sign Cantilever Br, US 101 SB | North Bend | Very Good | Very Good |
| 235.38 | 21668 | 1-26' Sign Cantilever Br, US 101 SB | North Bend | Very Good | Very Good |
| 235.39 | 21669 | $1-30^{\prime \prime} 6^{\prime \prime}$ Sign Cantilever Br, US 101 SB | North Bend | Very Good | Very Good |
| 238.14 | 20684 | 1-21' Sign Cantilever Br, US 101 SB | Coos Bay | Satisfactory | Satisfactory |
| 238.23 | 20685 | 1-21' Sign Cantilever Br, US 101 SB | Coos Bay | Satisfactory | Satisfactory |

Source: ODOT TransGIS
Culverts - See Figure 15.
Railroad Crossings - The Coos Bay rail line runs parallel to US 101 through Coos Bay and North Bend. There are 15 at-grade crossings where rail line intersects a number of local roads (shown in Figure 15). The rail line also passes under an overpass carrying US 101 at US 101 MP 234.76.

Medians/Islands/Curb - On US 101, there is approximately 800 feet of raised median just south of the North Bend couplet.

Anecdotal information provided from both cities suggest that all roads built to standard have curb. Data is not available to indicate the presence of curbed medians or pedestrian islands in either city.

On Street Parking - On street parking is widely available in both cities on most roads. The most utilized on street parking is found in the downtown areas of both cities on US 101 and intersecting side streets.

Pavement Condition - Data provided by the City of North Bend suggests that North Bend's road network pavement condition is generally 'good'. The City of Coos Bay's 2015 Pavement Condition Survey and Asset Management Plan provides a detailed review of Pavement Condition Index (PCI) scores for City-maintained roadways. In 2015, the overall condition of Coos Bay's road network was defined as 'fair,' with an average PCl of 64.3. See Appendix C for more details.

Coos Bay's 2015 Pavement Condition Survey and Asset Management Plan established PCI levels for when a street's PCI becomes critical for repair. These thresholds are summarized in Table 10 below. Although similar guidance was not available for North Bend, it is reasonable to expect similar thresholds due to the proximity, comparable environment and shared use.

Table 10. Pavement Condition Critical Thresholds by Functional Classification

| Functional Classification | Critical Condition (PCI) |
| :--- | :--- |
| Asphalt Concrete (AC) Streets |  |
| Principal Arterial | 55 |
| Minor Arterial | 55 |
| Principal Arterial | 55 |
| Principal Arterial | 55 |
| Portland Cement Concrete (PCC) - All | 10 |

Source: City of Coos Bay's 2015 Pavement Condition Survey and Asset Management Plan, pg. 8

--..: Urban Growth Boundary (UGB)

| $\quad$ Sign Cantilever Structure | -20 | $\circ$ | 10 |
| :--- | :--- | :--- | :--- |
| Study Area Intersections | -25 | 0 | 15 |
| Traffic Control | -30 | 0 | 20 |
| $\quad$ Free | -35 | 0 | 25 |
| - Signal | -45 | 0 | 30 |
| - Stop Control |  | 0 | 35 |
|  |  | - | 45 |

Posted Speed (ODOT) North Bend Speed Sign (MPH)
$-20$
$-25$

- 30
$-35$
- 25
- 30
- 35
- 45

Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

U.... Urban Growth Boundary (UGB)

- Bridge
$\times$ Rail Crossing
- Culvert
- Railroad
${ }_{N}^{N}$


## Existing Pedestrian and Bicycle Network

Provisions of a comprehensive pedestrian and bicycle facilities can enable people to walk and bike safely and efficiently between land uses. In addition, bicycling and walking are more environmentally friendly alternatives to driving. Improving the non-motorized elements of the transportation system can provide more choices for the traveling public and can have the added benefit of reducing vehicle congestion, carbon emissions and improving health through physical activity.

This section provides a basic inventory of the current pedestrian and bicycle network in the Cities of Coos Bay and North Bend.

## Pedestrian Network

Walking is the most affordable and accessible of all transportation modes. It is also clean, low-impact on the City's infrastructure, healthy for the individual, and integral to community livability. A walkable environment integrated with other modes of transportation is essential to creating a multi-modal transportation system. It is also a key component to reducing reliance on automobiles. Whether an entire trip is on foot or with a mobility device, people must walk for at least part of every trip, even when the trip takes place on transit, in an automobile, or on a bicycle.

## City of North Bend

The majority of North Bend's arterial and collector roads have sidewalks, as well as the street system in the downtown core. The City has identified a need for sidewalks on the following collector streets:

- $17^{\text {th }}$ Street
- Arthur Street
- Colorado Ave
- Crowell Lane
- Lakeshore Drive
- Oak Street.

Table 11 summarizes the sidewalk facilities on North Bend's arterial and collector system. Figure 17 summarizes North Bend's sidewalk system and identified needs. There are currently no specific sidewalk projects planned for construction.

Table 11. Inventory of Sidewalks on Arterials and Collectors - North Bend

| Roadway Name | Classification | Existing Sidewalks |
| :---: | :---: | :---: |
| US 101 | Principal Arterial | Yes ${ }^{1}$ |
| Virginia Ave | Minor Arterial/Urban Collector | Yes |
| Broadway Ave | Minor Arterial | Yes |
| Sherman Ave | Minor Arterial | Yes |
| Newmark St | Minor Arterial | Varies ${ }^{1}$ |
| $16^{\text {th }}$ St | Urban Collector | Yes |
| $17^{\text {th }}$ St | Urban Collector | Varies ${ }^{1}$ |
| Arthur St | Urban Collector | Varies ${ }^{1}$ |
| Colorado Ave | Urban Collector | South Side ${ }^{1}$ |
| Connecticut Ave | Urban Collector | Varies ${ }^{1}$ |
| Crowell Lane | Urban Collector | Varies ${ }^{1}$ |
| Harrison Ave | Urban Collector | Varies |
| Lakeshore Dr | Urban Collector | No |
| Maple Leaf St | Urban Collector | West Side |
| Maple St | Urban Collector | Yes |
| Oak St | Urban Collector | No ${ }^{1,2}$ |
| Pacific St | Urban Collector | East Side ${ }^{1}$ |
| Pony Creek St | Urban Collector | West Side ${ }^{1}$ |

${ }^{1}$ Identified need for pedestrian facilities in 2004 TSP or on ODOT TransGIS, ${ }^{2}$ Only section of road bordering school has sidewalks.
Note: Information on marked pedestrian crossings and sidewalk pavement condition and was not available for inclusion in this inventory.


Urban Growth Boundary (UGB)
[) Libraries
$\square$ Hospitals

- Schools

Missing Sidewalk
Sidewalk

Data Sources:
Cities of North Bend and Coos Bay
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## City of Coos Bay

The City of Coos Bay's sidewalk inventory was collected for the arterial and collector network. Table 12 below catalogs the existing sidewalk inventory. The inventory of the Coos Bay sidewalks is limited to "visual windshield validation." Further resources may exist in the study area that are not yet documented or are not visually apparent. There are currently no specific sidewalk projects planned for construction, but notes are included where the 2004 TSP identified a neeed.

Table 12. Inventory of Sidewalks on Arterials and Collectors - Coos Bay

| Roadway Name | Classification | Existing Sidewalks |
| :---: | :---: | :---: |
| US 101 | Principal Arterial | Varies ${ }^{1,2}$ |
| S Front St | Principal Arterial | No ${ }^{1}$ |
| S Empire Blvd | Arterial | Yes |
| Newmark Ave | Arterial | Yes |
| Ocean Blvd | Arterial | Yes |
| Woodland Dr | Arterial | No ${ }^{1}$ |
| Coos River Hwy | Arterial | No ${ }^{1}$ |
| $6{ }^{\text {th }}$ Ave | Arterial | No |
| Southwest Blvd | Arterial | Yes ${ }^{1}$ |
| Lockhart Ave | Arterial | No ${ }^{1}$ |
| Koosbay Blvd | Arterial | Varies ${ }^{1}$ |
| $N 7^{\text {th }}$ St | Arterial | Varies ${ }^{1}$ |
| N 10 ${ }^{\text {th }} \mathrm{St}$ | Arterial | Yes ${ }^{1}$ |
| Newport Ln | Arterial | Varies ${ }^{3}$ |
| Blanco Ave | Collector | Varies |
| Radar Rd | Collector | No |
| S Morrison St | Collector | No ${ }^{1}$ |
| Pacific Ave | Collector | North Side ${ }^{1}$ |
| Lakeshore Dr | Collector | No |
| N Morrison St | Collector | $\mathrm{No}^{1}$ |
| N Schoneman St | Collector | No ${ }^{1}$ |
| N Wasson St | Collector | Varies |
| Laclair St | Collector | Varies (North Side) |
| Thompson Rd | Collector | Yes |
| D St | Collector | No |
| F St | Collector | No |
| Butler Rd | Collector | Yes |


| Roadway Name | Classification | Existing Sidewalks |
| :--- | :--- | :--- |
| Hemlock Ave | Collector | Yes |
| $N 13^{\text {th }}$ St | Collector | Yes |
| S $4^{\text {th }}$ St | Collector | Yes |
| $N 4^{\text {th }}$ St | Collector | Yes |
| $14^{\text {th }}$ Ave | Collector | No |
| Juniper Ave | Collector | Yes |
| Fulton Ave | Collector | Yes |
| Virginia St | Collector | No |

Source: Bing Maps
${ }^{1}$ Identified need for pedestrian facilities in 2004 TSP or on ODOT TransGIS, ${ }^{2}$ US 101 lacks sidewalks on east side (M.P. 236.8237.88; NB M.P. 238.25-238.6), ${ }^{3}$ Newport Lane has sidewalks on the structure over the railroad and on the Isthmus slough bridge
Note: Information on marked pedestrian crossings and sidewalk pavement condition and was not available for inclusion in this inventory.

## Bicycle Network

## City of North Bend

As of this writing, the City of North Bend has limited bicycle facilities, and minor improvements have been made since the adoption of the previous TSP in 2004. The existing bike network, as shown in Figure 18, overlaps with the Oregon Coast Bike Route, a 370-mile signed bike route that runs from Astoria to Brookings and beyond. Within North Bend, the OCBR shares the roadway with motor vehicles along US 101, Virginia Avenue, Broadway Avenue, and Newmark Street, with minimal marked and unmarked shoulders. As the entire bike network is on street, the condition and surface type of bike facilities is equivalent to pavement conditions for the streets on which they exist. Table 13 below catalogs both existing facilities and planned bike facilities from the current TSP on arterial and collector streets. Current standards for bicycle facilities on arterial and collector streets require a minimum 6-foot bike lane for new construction and 5 to 6-foot bike lane for reconstruction.

Table 13. Inventory of Bicycle Facilities on Arterials and Collectors

| Roadway Name | Classification | Existing Bike Facility | Planned Bike Facility |
| :--- | :--- | :--- | :--- |
| US 101 | Principal Arterial | Yes $^{1,2}$ | Yes |
| Virginia Ave | Minor Arterial/Urban Collector | Yes $^{1}$ | Yes |
| Broadway Ave | Minor Arterial | Yes $^{1}$ | Yes |
| Sherman Ave | Minor Arterial | No | Yes |
| Newmark St | Minor Arterial | Yes $^{1}$ | No |
| $16^{\text {th }}$ St | Urban Collector | No | Yes |
| $17^{\text {th }}$ St | Urban Collector | No | Yes |
| Arthur St | Urban Collector | Urban Collector | No |
| Colorado Ave |  |  | Yes |


| Roadway Name | Classification | Existing Bike Facility | Planned Bike Facility |
| :--- | :--- | :--- | :--- |
| Connecticut Ave | Urban Collector | No | Yes |
| Crowell Lane | Urban Collector | No | Yes |
| Harrison Ave | Urban Collector | No | No |
| Lakeshore Dr | Urban Collector | No | Yes |
| Maple Leaf St | Urban Collector | No | No |
| Maple St | Urban Collector | No | Yes |
| Oak St | Urban Collector | No | Yes |
| Pacific St | Urban Collector | No | Yes |
| Pony Creek St | Urban Collector | No | Yes |
| Thompson Ave | Urban Collector | No | Yes |
| 1 |  |  |  |

${ }^{1}$ Oregon Coast Bike Route, ${ }^{2}$ Bike lanes between MP 236.1 and 236.5
Note: Information on bicycle crossings and parking was not available for inclusion in this inventory.

## City of Coos Bay

As of this writing, the City of Coos Bay has a limited bicycle network, and minor improvements have been made since the adoption of the previous TSP in 2004. The existing bike network, as shown in Figure 18, includes part of the Oregon Coast Bike Route (OCBR) and a few other facilities, principally in and near downtown Coos Bay and the Empire neighborhood. As the entire bike network is on street, the condition and surface type of bike facilities is equivalent to pavement conditions for the streets on which they exist. Table 14 below catalogs both existing facilities and planned bike facilities from the current TSP on arterial and collector streets. Current standards for bicycle facilities on arterial and collector streets require a minimum 6-foot bike lane for new construction and 5 to 6 -foot bike lane for reconstruction.

For a portion of the Oregon Coast Bike Route (OCBR) in Coos Bay that runs along Newmark Avenue between Fir Street and Ackerman Avenue, the facility has approximately 5 -foot wide bike lanes on either side of the roadway. The rest of the OCBR shares the roadway with vehicles on Newmark Avenue. On S Empire Boulevard, there are 6 -foot bike lanes from Newmark Avenue to the southern city limits. Striped bike lanes approximately 5 -feet wide also exist in downtown Coos Bay on US 101 southbound between Curtis Avenue and Johnson Avenue and northbound between Johnson Avenue and Central Avenue. In addition, Ocean Boulevard has 7 - to 8 -foot wide bike lanes between $\mathrm{N} 19^{\text {th }}$ Street and Central Avenue, and 6 -foot bike lanes from Newmark Avenue to Lindy Lane. All existing facilities meet current standards adopted in the 2004 TSP.

Table 14. Inventory of Bicycle Facilities on Arterials and Collectors

| Roadway Name | Classification | Existing Bike Facility | Planned Bike Facility |
| :--- | :--- | :---: | :---: |
| US 101 | Principal Arterial | Yes $^{1}$ | Yes |
| S Front St | Principal Arterial | No | No |
| Newport Ln | Minor Arterial | No | No |


| Roadway Name | Classification | Existing Bike Facility | Planned Bike Facility |
| :---: | :---: | :---: | :---: |
| S Empire Blvd | Arterial | Yes | Yes |
| Newmark Ave | Arterial | Yes | Yes |
| Ocean Blvd | Arterial | Yes | Yes |
| Woodland Dr | Arterial | No | Yes |
| Coos River Hwy | Arterial | No | Yes |
| $6{ }^{\text {th }}$ Ave | Arterial | No | Yes |
| Southwest Blvd | Arterial | No | Yes |
| Lockhart Ave | Arterial | No | Yes |
| Koosbay Blvd | Arterial | No | Yes |
| $N 7^{\text {th }}$ St | Arterial | No | Yes |
| $\mathrm{N} 10^{\text {th }} \mathrm{St}$ | Arterial | No | Yes |
| Blanco Ave | Collector | No | No |
| Radar Rd | Collector | No | No |
| S Morrison St | Collector | No | Yes |
| Pacific Ave | Collector | No | Yes |
| Lakeshore Dr | Collector | No | Yes |
| N Morrison St | Collector | No | Yes |
| N Schoneman St | Collector | No | Yes |
| N Wasson St | Collector | No | No |
| Laclair St | Collector | No | No |
| Thompson Rd | Collector | No | Yes |
| D St | Collector | No | No |
| F St | Collector | No | No |
| Butler Rd | Collector | No | No |
| Hemlock Ave | Collector | No | Yes |
| $\mathrm{N} 13^{\text {th }} \mathrm{St}$ | Collector | No | No |
| S $4{ }^{\text {th }}$ St | Collector | No | Yes |
| $N 4^{\text {th }}$ St | Collector | No | Yes |
| $14^{\text {th }}$ Ave | Collector | No | No |
| Juniper Ave | Collector | No | Yes |
| Fulton Ave | Collector | No | No |
| Virginia St | Collector | No | Yes |

${ }^{1}$ Bike lanes in downtown Coos Bay on Broadway and Bayside Dr
Note: Information on bicycle crossings and parking was not available for inclusion in this inventory.


Figure 18. Bicycle Network

## Existing Public Transit Services

## Local Services

Coos County Area Transit (CCAT) provides local public transportation services to the City of Coos Bay and City of North Bend, including fixed-route bus, paratransit (dial-a-ride) services, and intercity service to connections north to Lakeside and Hauser and south to Coquille, Myrtle Point, and Powers. The route names and description are included in Table 15. Figure 19 shows the Bay Area Loop service, and Figure 20 shows intercity connections CCAT provides to Lakeside, Hauser, Coquille, Myrtle Point, and Powers.

The Bay Area East and West Loop route serves as North Bend and Coos Bay's local public transportation service. Transfer points between the East and West Loop are at Wal-Mart and Pony Village Mall.

The East Loop originates and ends at 9th and Anderson in downtown Coos Bay. There are 28 total stops along the route. Community destinations served by the East Loop route include the Coos Bay Post Office, Senior Center, Work Source, South Coast Business Employment Corporation, Bay Area Hospital, Wal-Mart, Coos County Annex, and Pony Village Mall.

The West Loop originates and ends at Davey Jones Locker in Charleston, which is located five miles south of Coos Bay. There are 27 total stops along the route. Community destinations served by the West Loop route include Star of Hope Community Center, Coos Health and Wellness, Wal-Mart, Newmark Center Southwestern Oregon Community College, DHS/North Bend Senior Center, and Pony Village Mall.

The CCAT Dial-A-Ride Program includes curb-to-curb service within the city limits of Coos Bay and North Bend, along with Bandon, Myrtle Point, and Coquille. Service in Coos Bay and North Bend is limited to $3 / 4$ mile of either side of an existing fixed route.

As of May 2018, CCAT also operates a free, ADA accessible shuttle service for all Veterans with a verified medical appointment at the Roseburg and Eugene VA Medical Centers. The shuttle operates Tuesday and Thursday to Roseburg and Wednesday to Eugene, departing from the North Bend VA Clinic at 7:00 am and returning by 4:00 pm.

Table 15. Coos County Area Transit Route Descriptions

| Route Name | Service | Frequency |
| :--- | :--- | :--- |
| Bay Area Loop-East <br> Loop | Local fixed-route | - Monday through Friday |
|  |  | - 1.5 -hour headways | - First bus at 7:05 am; last bus at 4:05 pm


| Route Name | Service | Frequency |
| :---: | :---: | :---: |
| Myrtle Point/Coquille Connector | Intercity service | - Three times a day to Myrtle Point and Coquille, Monday through Friday <br> - Morning: Bus at 6:55 am from W. Central and N . Laurel <br> - Mid-Day: Bus at 11:00 am from W. Central and N. Laurel <br> - Afternoon: Bus at 3:30 pm from W. Central and N. Laurel <br> - Powers Stage runs to Myrtle Points, Coquille, North Bend, and Coos Bay every Thursday |

## Regional Connections

In addition to intercity service provided to CCAT, regional connections are available through the following public transportation providers:

## Curry Public Transit - Coastal Express

Offers connecting service from North Bend and Coos Bay to the communities of Bandon, Port Orford, Gold Beach, Brookings, Harbor and Smith River. The Coastal Express operates Monday thru Friday and provides service three times daily in the morning, mid-day, and early afternoon. Figure 21 displays the Coastal Express route and the location of stops in North Bend and Coos Bay.

## UTrans

Offers connecting service to the greater Roseburg area and commuter services to Winston, Sutherlin, Myrtle Creek, Riddle, and Canyonville.

## Pacific Crest Bus Lines

Offers service to Reedsport, Florence, and Eugene once daily, seven days a week.

## Other Services

Currently, CCAT does not operate any park and ride facilities. In addition, there are no carpool and vanpool programs specific to North Bend and Coos Bay outside of ODOT's Drive Less Connect program, nor any formalized employed-based commute programs. ${ }^{7}$

[^30]

Urban Growth Boundary (UGB)

## Bay Area Loop




Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Coos Bay/North Bend TSP



## LEGEND

To Coquille - Myrtle Point - Powers
$\qquad$ Urban Growth Boundary (UGB)

## Intercity Connections

_Lakeside - Hauser

- Coquille - Myrtle Point - Powers

O Transit Stops


Data Sources:
Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

Figure 20. Coos County Area Transit - Intercity Connections


Figure 21. Curry Public Transit - Coastal Express

## Existing Air, Water, Rail, and Pipeline Inventories

While the movement of goods and commodities into, out of, and through the Coos Bay/North Bend area is heavily dependent on the highway system (see the discussion of the Freight Routes in the Existing Street Network section above), freight movement also occurs via rail and pipeline modes. This section describes air, water, rail, and pipeline facilities in the study area.

## Air Facilities

Southwest Oregon Regional Airport (OTH) is located on approximately 620 acres of land extending out into Coos Bay, in the northern sections of North Bend and Coos Bay. ${ }^{8}$ Owned and operated by the Coos County Airport District (CCAD), OTH is the only commercial service airport on the Oregon Coast. From May 2017 to April 2018, OTH served approximately 25,000 revenue passengers and 1.5 Million pounds of freight and mail. ${ }^{9}$ The airport's top passenger destinations are San Francisco, CA and Denver, CO. The airport also accommodates private aircraft arrivals and departures and serves as a base for US Coast Guard operations. Airport parking is free of charge.

## Water Facilities

Coos Bay and North Bend are set on Coos Bay, a major inlet draining into the Pacific Ocean. The Bay's navigation channel is designed and maintained by the US Army Corps of Engineers and facilitates significant maritime trade activity at six marine terminals, seven deep-draft berths, and a number of barge facilities. ${ }^{10}$ The Port of Coos Bay moves more than 1.5 million tons of cargo annually - more than any other seaport in Oregon.

## Rail Facilities

One railroad line passes through North Bend and Coos Bay. Owned by the Port of Coos Bay, the Coos Bay Rail Line is operating as the Coos Bay Rail Link (CBR) and spans 134 miles from Coquille to Danebo Junction in Eugene. ${ }^{11}$ In Coos Bay and North Bend, the Coos Bay rail line runs parallel to US 101. Currently, the railroad line is exclusively for freight, with about 99 percent of their product moved being related to the timber industry. ${ }^{12}$

CBR tracks are classified by the Association of American Railroads (AAR) as local. Once the current phase of rehabilitation is complete, the rail line will have been restored to a mix of Federal Railroad Administration (FRA) Class 2 ( 25 mph ) and Class 3 ( 40 mph ) conditions. Detailed information on frequency of service was not available. No passenger rail service is available in the study area; the closest available is AMTRAK located in Eugene, Oregon.

[^31]
## Pipeline Facilities

There is a Coos County natural gas pipeline operated by NW Natural Gas in the Coos Bay/North Bend area. This pipeline extends east, connecting with the Williams' Northwest Pipeline. ${ }^{13,14}$

The Pacific Connector Gas Pipeline project proposes to add a second pipeline in the study area, connecting the Jordon Cove liquid natural gas terminal in the City of Coos Bay and Malin, OR with a pipeline 229 miles long, and 36 inches in diameter.

[^32]
## Environmental and Cultural Inventories

The following summarizes the existing natural resources and environmental features found in Coos Bay and North Bend. The following sections illustrate and describe areas that may pose barriers to providing transportation access or improvements. The inventory is based on available Geographic Information System (GIS) maps, previous reports, and known resource sites. Further resources may exist in the study area that are not yet documented or are not visually apparent.

Coos Bay and North Bend's unique environment attract large number of visitors every year, and the planning process should take special care to identify and protect these resources. The following figures map environmental constraints for the transportation system in Coos Bay/North Bend, including environmental and cultural resources and hazards as listed below.

- Goal 5: Statewide Planning Goal 5 requires local jurisdictions to inventory natural resources such as riparian corridors, wetlands, and wildlife habitat.
- Federal Emergency Management Agency (FEMA) Floodplains: FEMA 100-year floodplain is shown on Figure 26. The impacted areas are focused near existing waterways.
- National Wetland Inventory: The wetland types are mapped in Figure 24.
- Tsunami Inundation Zone: Figure 26. See the Comprehensive Plan and Zoning Designations section starting on page 3 of this document for additional details.
- Known Slide Areas: Landslide deposits exist in areas of southern and southeastern Coos Bay. These areas are mapped in Figure 24.
- Threatened and Endangered Species: There are several threatened \& endangered species within the study area. The majority of the species rely on the existing marine and wetland environments in and around the Coos Bay. These species are mapped in Figure 25.
- Hazardous Materials Sites: There are several hazardous material sites throughout the study area, mostly related to historic rail operations. In addition to those sites, there are leaking underground storage tanks scattered throughout North Bend and Coos Bay, mostly surrounding areas of commercial land use. See Figure 23.
- Historic and Archaeological Resources: North Bend has 4 properties designated by the City as historically significant and/or nationally registered, while Coos Bay has 22. Properties. ${ }^{14}$ See Figure 22.
- Tribal Lands: There are two tribal lands areas in North Bend and three areas in Coos Bay. These areas are mapped in brown in Figure 22.
- Section 4(f) and 6(f) Resources: Not mapped. There are no $4(\mathrm{f})$ or $6(\mathrm{f})$ sites in the study area. ${ }^{15,16}$

[^33]
..... Urban Growth Boundary
(UGB)
$\square$
Tribal LandEligible/Listed Oregon Historic Site

:-…: Urban Growth Boundary
(UGB)
1
Hazardous Material Site
(ECSI Database)
Leaking Underground

* Storage Tank (LUST Databse)


Figure 23. Hazardous Materials

....... Urban Growth Boundary Wetland Types
:...... (UGB)
$\star$
$\qquad$ Landslide DepositsLocal Park

Estuarine and Marine
Deepwater
Estuarine and Marine Wetland

Freshwater Emergent Wetland

Freshwater Forested/Shrub
Wetland
Freshwater Pond
Lake
Riverine


| ...: Urban Growth Boundary <br> (UGB) | Green sturgeon and Steelhead (Oregon Coast |
| :---: | :---: |
| Threatened \& Endangered | ESU, winter run) |
| Species | Pacific lamprey |
| American peregrine falcon | : Pt. Reyes bird's-beak |
| Black-grass rush | :i. Purple martin |
| California brown pelican | 713 Western marsh-rosemary |
| Coho Salmon (Oregon Coast ESU) | Western snowy plover |

## Data Sources:

Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT),
Oregon Department of Environmental Quality (DEQ), Oregon Geospatial Enterprise Office,
Oregon Biodiversity Information Center (ORBIC), ESRI ArcGIS Online

Figure 25. Threatened and Endangered Species


TCノபи
＾nnca

Appendix A Road Inventory
Appendix B Miscellaneous Geometry：North Bend Stop Control and ODOT ADA Mapping
Appendix C Pavement Reports
Appendix D Historical Sites

Road Inveitury

Cities of Coos Bay and North Bend Transportation System Plan Updates (APPENDIX)

|  |  |  |  |  |  |  |  |  |  |  |  |  | adway |  |  | SIdewal |  |  | Bike Lail |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street Name | From | To | Designation | Jurisdiction | Federal Functional Class | City Functional Class | No. of Lanes | Posted <br> Speed | Street Parking | Median | Pavement Width (ft) | $\begin{array}{\|c} \hline \text { Surface } \\ \text { Type } \\ \hline \end{array}$ | Surface Condition | Shoulder Width | Location | Condition | Buffer | Width (ft.) | Location | $\begin{array}{\|c\|} \hline \begin{array}{c} \text { Width } \\ \text { (fit.) } \end{array} \\ \hline \end{array}$ | City |
| State Highways |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| US 101 | North City Limit | Ferry Rd | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 45 | No | None | 26 | CU | Good | Curb | Both | Good | None | 5 | None | n/a | NB |
| US 101 | Ferry Rd | Montana Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 4 | 30 | No | None | 48 | AU | Very good | Curb | Both | Good | Partial | 5 | None | n/a | NB |
| US 101 (SB) | Northern Couplet Begin (Montana Ave) | Connecticut Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 3 | 30 | East | None | 52 | AU | Very good | Curb | Both | Excellent | None | >10 | None | n/a | NB |
| US 101 (SB) | Connecticut Ave | Southern Couplet End (Washington Ave) | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 3 | 20 | Both | None | 52 | AU | Very good | Curb | Both | Excellent | None | >10 | None | n/a | NB |
| US 101 (NB) | Northern Couplet <br> Begin (Montana Ave) | Connecticut Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2-3 | 30 | No | None | 28-52 | AU | Very good | Curb | Both | GoodExcellent | None | >10; 5 | None | n/a | NB |
| US 101 (NB) | Connecticut Ave | Southern Couplet End (Washington Ave) | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 3 | 25 | Both | None | 52 | AU | Very good | Curb | Both | Good- <br> Excellent | None | >10; 5 | None | n/a | NB |
| US 101 (SB) | Washington Ave | M.P. 235.73 | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 35 | No | Curbed | 28 | AU | Very good | Curb | West | Excellent | None | 6 | None | n/a | NB |
| US 101 (NB) | Washington Ave | M.P. 235.73 | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 35 | No | Curbed | 28 | AU | Very good | Curb | East | Good | None | 5-6 | None | n/a | NB |
| US 101 | M.P. 235.73 | M.P. 236.77 (South City Limit) | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 5 | 45 | No | Painted | 48-82 | AU | Very good | Curb | West | Fair-Good | None | 5 | None | n/a | NB |
| US 101 (SB) | M.P. 236.77 (North City Limit) | Northern Couplet Begin | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 5 | 45 | No | Painted | 52-68 | AU | Very good | Curb | West | Good- <br> Excellent | None | 5-8 | West (Beg. Myrtle Ave) | <6 | CB |
| US 101 (SB) | Northern Couplet Begin | Market Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 30 | Both | None | 30-46 | AU | Good | Curb | Both | Good | None | 5-8 | None | n/a | CB |
| US 101 (SB) | Market Ave | Curtis Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 20 | Both | None | 46 | AU | Good | Curb | Both | Good | None | 5-8 | None | n/a | CB |
| US 101 (SB) | Curtis Ave | Southern Couplet End (S 1st St) | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2-3 | 30 | Both | None | 29-47 | AU | Good | Curb | Both | Good | None | 5-10 | West | n/a | CB |
| US 101 (NB) | Northern Couplet Begin | Market Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 30 | Both | None | 27-50 | AU | Good | Curb | Both | Fair-Good | Varies | 5-8 | None | n/a | CB |
| US 101 (NB) | Market Ave | Curis Ave | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 25 | Both | None | 36-60 | AU | Good | Curb | Both | Good | None | 5-8 | None | n/a | CB |


| Street Name | From | To | Designation | Jurisdiction | Federal Functional Class | City Functional Class | No. of Lanes | Posted Speed |  |  | Roadway |  |  |  | Stiewalks |  |  |  | Bike Lanes |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  | Median | Pavement Width (ft) | $\begin{gathered} \text { Surface } \\ \text { Type } \end{gathered}$ | Surface Condition | Shoulder Width | Location | Condition | Buffer | Width (ft.) | Location $\begin{array}{c}\text { Widith } \\ \text { (fi.) }\end{array}$ City |  |  |
| US 101 (NB) | Curtis Ave | Southern Couplet End (S 1st St) | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 2 | 30 | East (Varies) | None | 54-72 | AU | Good | Curb | Both | Good | None | 5-8 | East | <6 | CB |
| US 101 | Southern Couplet <br> End (S 1st St) | Newport Lane | OHP Freight Rt.; Statewide Hwy; NHS; Oregon Scenic Byway | ODOT | Urban Other Principal Arterial | Principal Arterial | 5 | 30 | No | Painted | 72 | AU | Good | Curb | Both | Fair-Good | None | 5-8 | None | n/a | CB |
| Hwy 240 (Cape Arago) | US 101 | Pony Creek Bridge | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 4 | 25 | No | None | 24-26 | AU | Good | Curb | Both | Good | None | 5-8 | None | n/a | NB |
| Hwy 240 (Cape <br> Arago) | Pony Creek Bridge | Broadway Ave | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 5 | 30 | No | Painted | 24 | AU | Good | Curb | Both | Good | None | 5-8 | None | n/a | NB |
| Hwy 240 (Cape <br> Arago) | Broadway Ave | 12th St | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 4-5 | 30 | No | Painted | 24-26 | AU | Poor | Curb | Both | Fair | None | 5-8 | None | n/a | NB |
| Hwy 240 (Cape Arago) | 12th St | State St | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 5 | 35 | No | Painted | 26 | AU | Poor | Curb | Both | Fair-Good | None | 5 | None | n/a | NB |
| Hwy 240 (Cape <br> Arago) | State St | Newmark St | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 4 | 30 | No | Painted | 26 | AU | Fair | Curb | Both | Fair-Good | None | 5 | None | n/a | NB |
| Hwy 240 (Cape <br> Arago) - Channelized | State St | Newmark St | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 1 | 35 | No | Painted | 24 | AU | Fair | Curb | North | Fair-Good | None | 5 | None | n/a | NB |
| Hwy 240 (Cape Arago) | Broadway Ave | Channelized Lane | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 5 | 30 | No | Painted | 26 | AU | Fair | Curb | Both | Fair-Good | None | 5 | None | n/a | NB |
| Hwy 240 (Cape Arago) | Channelized Lane | Fir St | STA; District Hwy; NHS | ODOT | Urban Other Principal Arterial | Arterial | 5 | 35 | No | Painted | 26 | AU | Fair | Curb | Both | Fair-Good | None | 5 | None | n/a | NB |
| Hwy 241 (Coos River Highway) | US 101 | Edward Rd | Statewide Hwy; NHS | ODOT | Urban Minor Arterial | Arterial | 2 | 35 | North (Varies) | Curbed | 22-59 | AU | Fair-Good | 8 | South | Fair | None | 4 | None | n/a | CB |
| Hwy 241 (Coos River Highway) | Edward Rd | I St | District Hwy | ODOT | Urban Minor Arterial | Arterial | 2 | 35 | No | None | 26-46 | AU | Fair-Good | 1-6 | Both | Fair-Good | None | 3-4 | None | n/a | CB |
| City Roadways |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Broadway Avenue | Newmark St | South City Limit | -- | City | Urban Minor Arterial | Minor Arterial | 3 | 35 | No | -- | 42 | AC | -- | -- | Both | -- | None | 5 | None | n/a | NB |
| Sherman Avenue | soutnern couplet <br> End (Washington <br> Anol | South City Limit | - | City | Urban Minor Arterial | Minor Arterial | 2 | 25 | Yes | -- | 20-50 | AC/PCC | -- | -- | Both | - | Landscape | 5-6 | None | n/a | NB |
| Newmark Street | Hwy 240 (Broadway Ave) | US 101 | - | City | Urban Minor Arterial | Minor Arterial | 2-4 | 25-35 | No | -- | 33-53 | AC | -- | -- | Varies | - | None | 0-5 | None | n/a | NB |
| Virginia Avenue | West City Limit | Broadway Ave | -- | City | Urban Collector | Urban Collector | 4-5 | 25 | Varies | -- | 33-60 | AC | -- | -- | Both | -- | None | 4-5 | None | n/a | NB |
| 16th Street | Aron) | Pacific Ave | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 33 | AC | -- | -- | Both | -- | None | 5 | None | n/a | NB |
| 17th Street | West City Limit | Hwy 240 (Cape Arago) | - | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 33 | AC | -- | -- | None <br> (Varies Myrtle to Broadway) | -- | n/a | n/a | None | n/a | NB |


|  |  |  |  |  |  |  |  |  |  |  |  |  | dadway |  |  | Stidewali |  |  | Bike La |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Street Name | From | To | Designation | Jurisdiction | Federal Functional Class | City Functional Class | No. of Lanes | Posted Speed | Street <br> Parking | Median | Pavement Width (ft) | $\begin{array}{\|c} \text { Surface } \\ \text { Type } \end{array}$ | Surface Condition | Shoulder Width | Location | Condifition | Buffer | Width (ft.) | Location | Width (ft.) | City |
| Arthur Street | Colorado Ave | Virginia Ave | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 36 | AC | -- | -- | Varies | -- | None | 5 | None | n/a | NB |
| Brussels Street | Pony Creek St | Newmark St | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 34 | AC | -- | -- | Varies | -- | None | 5 |  |  | NB |
| Colorado Avenue | Arthur St | Oak St | -- | City | Urban Collector | Urban Collector | 2 | 25 | Varies | -- | 42 | AC | -- | -- | South | -- | Landscape | 4 | None | n/a | NB |
| Connecticut Avenue | Meade Ave | US 101 | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 50 | AC | -- | -- | Varies | -- | None | 6 | None | n/a | NB |
| Crowell Lane | Pacific Street | Pony Creek St | -- | City | Urban Collector | Urban Collector | 2 | 20 | No | -- | 30 | AC | -- | -- | Varies | -- | None | 5 | None | n/a | NB |
| Harrison Avenue | Twy z40 Moape | Pony Creek St | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 33 | AC | -- | -- | Varies | -- | Landscape | 5 | None | n/a | NB |
| Lakeshore Drive | City Limit | City Limit | -- | County | Urban Collector | Urban Collector | 2 | 25 | No | -- | 28-36 | AC | -- | -- | No | -- | n/a | n/a | None | n/a | NB |
| Maple Leaf Street | Oak St | Maple St | -- | City | Urban Collector | Urban Collector | 2 | 25 | No | -- | 42 | AC | -- | -- | West | -- | None | 4 | None | n/a | NB |
| Maple Street | Maple Leaf St | Virginia Ave | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 44 | AC | -- | -- | Yes | -- | None | 5 | None | n/a | NB |
| Meade Avenue | Twy 240 पCape | Connecticut Ave | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 50 | AC | -- | -- | Yes | -- | None | 6 | None | n/a | NB |
| Oak Street | Colorado Ave | Hwy 240 (Cape Arago) | -- | City | Urban Collector | Urban Collector | 2 | 25 | Yes | -- | 33-36 | AC | -- | -- | No | -- | n/a | n/a | None | n/a | NB |
| Pacific Street | Crowell Ave | 16th St | -- | City | Urban Collector | Urban Collector | 2 | 20-25 | Yes | -- | 33 | AC | -- | -- | East | -- | None | 5 | None | n/a | NB |
| Pony Creek Street | Harrison Ave | Brussells St | -- | City | Urban Collector | Urban Collector | 2 | 25 | Varies | -- | 30-32 | AC | -- | -- | West | -- | Landscape | 5 | None | n/a | NB |
| S Front Street | US 101 | Lockhart Ave | -- | City | Urban Minor Arterial | Arterial | 2 | 25 | No | -- | 36 | Gravel | -- | -- | No | -- | - | -- | None | n/a | CB |
| S Empire Boulevard | Newmark Ave | City Limit | -- | City | Urban Minor Arterial | Arterial | 2 | 30 | Yes | -- | 32 | AC | -- | -- | Yes | -- | -- | -- | Yes | -- | CB |
| Newmark Avenue | Ocean Blvd | City Limit | NHS | City | Other Urban Principal Arterial | Arterial | 2 | 30-35 | Yes | -- | 66 | AC | -- | -- | Yes | -- | -- | -- | Yes | -- | CB |
| Newmark Avenue | Empire Blvd | Ocean Blvd | NHS | City | Urban Minor Arterial | Arterial | 2-5 | 30-35 | Varies | -- | 46-81 | AC | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Ocean Boulevard | Newmark Ave | Central Ave | NHS | City | Other Urban Principal Arterial | Arterial | 3-4 | 30-40 | Varies | -- | 56 | AC | -- | -- | Yes | -- | -- | -- | Yes | -- | CB |
| Central Avenue | Ocean Blvd | N 7th St | NHS | City | Other Urban Principal Arterial | Arterial | 3 | 30 | Varies | -- | 44 | AC | -- | -- | Yes | -- | -- | -- | Yes | -- | CB |
| Commercial Avenue | N 7th St | US 101 | NHS | City | Other Urban Principal Arterial | Arterial | 2 | 25 | Varies | -- | 44 | AC | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Anderson Avenue | N 7th St | US 101 | NHS | City | Other Urban Principal Arterial | Arterial | 2 | 25 | Yes | -- | 44 | AC | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Woodland Drive | North City Limit | Ocean Blvd | - | City | Urban Minor Arterial | Arterial | 3 | 30 | Yes | -- | 40 | AC | -- | -- | No | - | -- | -- | None | n/a | CB |
| Coos River Highway | 6th Ave | City Limit | - | City | Urban Minor Arterial | Arterial | 2 | 35 | No | -- | 32-40 | AC/AC | -- | -- | No | -- | -- | -- | None | n/a | CB |
| 6th Avenue | \| St | D St | -- | City | Urban Minor Arterial | Arterial | 2 | 35 | No | -- | -- | -- | -- | -- | No | - | -- | -- | None | n/a | CB |
| Southwest Boulevard | S 7th St | South City Limit | -- | City | Urban Minor Arterial | Arterial | 2 | 25 | Yes | -- | 36-40 | AC | -- | -- | Varies | - | - | -- | None | n/a | CB |
| Lockhart Avenue | S 7th St | S Front St | -- | City | Urban Minor Arterial | Arterial | 2 | 25 | No | -- | 40-44 | AC | -- | -- | No | -- | -- | -- | Yes | n/a | CB |


| Street Name | From | To | Designation | Jurisdiction | Federal Functional Class | City Functional Class | No. of Lanes | Posted Speed |  | Roadway |  |  |  |  | SIdewalks |  |  |  | Bike Lanes |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  | Median | Pavement Width (ft) | $\begin{array}{\|c\|c\|} \hline \text { Surface } \\ \text { ) } & \text { Type } \\ \hline \end{array}$ | Surface Condition | Shoulder Width | Location | Condition | Buffer | Width (ft.) | Location $\begin{array}{c}\text { Width } \\ \text { (fi.) }\end{array}$ City |  |  |
| Koosbay Boulevard | North City Limit | N 10th St | -- | City | Urban Minor Arterial | Arterial | 2 | 25-30 | No | -- | 36-40 | AC/AC | -- | -- | Varies | -- | -- | -- | None | n/a | CB |
| Koosbay Boulevard | N 10th St | US 101 | -- | City | Urban Collector | Arterial | 2 | 30 | Yes | -- | 36-40 | AC | -- | -- |  | -- | -- | -- |  |  | CB |
| N 7th Street | Commercial Ave | Anderson Ave | NHS | City | Other Urban Principal Arterial | Arterial | 2 | 25 | No | -- | 35-46 | AC/PCC | -- | -- | Varies | -- | -- | -- | None | n/a | CB |
| N 10th Street | Koosbay Blvd | Central Ave | -- | City | UाणवाITIVIITIU | Arterial | 2 | 30 | Yes | -- | 28-36 | AC/PCC | -- | -- | Varies | -- | -- | -- | None | n/a | CB |
| Blanco Avenue | S Morrison St | Fulton Ave | -- | City | Urban Collector | Collector/Local | 2 | 25 | Yes | -- | -- | -- | -- | -- | Varies | -- | -- | -- | None | n/a | CB |
| Radar Road | Ocean Blvd | Fulton Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | No | -- | -- | -- | None | n/a | CB |
| S Morrison Street | Newmark Ave | Blanco Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 36 | AC/AC | -- | -- | No | -- | -- | -- | None | n/a | CB |
| Pacific Avenue | Empire Blvd | S Morrison St | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 36 | AC | -- | -- | North | -- | -- | -- | None | n/a | CB |
| Crocker Street | Virginia St | Lakeshore Dr | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | No | -- | -- | -- | None | n/a | CB |
| Lakeshore Drive | City Limit | Taylor Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 18-36 | AC/AC | -- | -- | No | -- | -- | -- | None | n/a | CB |
| N Morrison Street | Lakeshore Dr | Harris Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 24-36 | AC/AC | -- | -- | No | -- | -- | -- | None | n/a | CB |
| N Schoneman Street | Harris Ave | Newmark Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 36 | AC | -- | -- | No | -- | -- | -- | None | n/a | CB |
| N Wasson Street | Taylor Ave | Newmark Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 36-56 | AC | -- | -- | Varies | -- | -- | -- | None | n/a | CB |
| Laclair Street | Newmark Ave | Ocean Blvd | - | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | Varies <br> (North) | -- | -- | -- | None | n/a | CB |
| Thompson Road | Woodland Dr | Koosbay Blvd | -- | City | Urban Collector | Collector | 2 | 30 | Yes | -- | 36 | AC/AC | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| D Street | Coos River Hwy | 14th Ave | -- | City | Urban Collector | Collector | 2 | 25 | No | -- | 24 | AC | -- | -- | No | -- | -- | -- | None | n/a | CB |
| F Street | 6th Ave | 14th Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | No | -- | -- | -- | None | n/a | CB |
| Butler Road | Juniper Ave | Ocean Blvd | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Hemlock Avenue | N 13th St | N 10th St | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| N 13th Street | Juniper Ave | Hemlock Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| S 4th Street | Commercial Ave | Lockhart Ave | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | 44-60 | A/C | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Juniper Avenue | Butler Rd | N 13th St | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Fulton Avenue | Blanco Ave | Radar Rd | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | Yes | -- | -- | -- | None | n/a | CB |
| Virginia Street | City Limit | Crocker St | -- | City | Urban Collector | Collector | 2 | 25 | Yes | -- | -- | -- | -- | -- | No | -- | -- | -- | None | n/a | CB | Notes

ODOT Data from TransGIS

- North Bend Data from GIS shapefiles
- Coos Bay Data from Pavement Width Table and GIS files
-- = Data not
- available
- n/a = Data not applicable

A~nの D
Miscellaneous ueumeıy: North beıu Stop Conıuı aıı ODC, ADA Mäppıry

:--.-: Urban Growth Boundary (UGB)

- STOP Sign



Annのr r

## Pavement nepuis

## City of

## Coos Bay

PUBLIC WORKS


## FINAL REPORT JUNE 2015 PAVEMENT CONDITION SURVEY AND ASSET MANAGEMENT PLAN



June 1, 2015
City of Coos Bay
Attn: Jim Hossley
Public Works Director
500 Central Avenue
Coos Bay, OR 97420

## Subject: Final Report Submittal for City-wide Pavement Management Program

Mr. Hossley:

As part of the development of the Pavement Management System for the City of Coos Bay, OMNIS Inc. hereby submits this Final Report.

The information contained in this report presents the findings from the development of the system data associated with the pavement condition survey of the City's street network. The City is also provided with the information that was used to develop the recommended improvement program. The report covers the following categories:

- Introduction
- Methodologies
- Condition Distribution Report
- Pavement Condition Index (PCI)
- Projected Work

It has been a pleasure working with the City on developing the City's Pavement Management Program. Should you have any questions or comments, please contact us at (909)631-8335.

Sincerely,

## Omnis Incorporated

John Gabor
Project Manager

## TABLE OF CONTENTS

Executive Summary
I. Introduction ..... 2
II. Methodology ..... 5
III. Condition Distribution Report ..... 13
IV. Pavement Condition Index (PCI) Report ..... 18
A. PCI Alphabetical Order ..... 20
B. PCI Descending Order ..... 37
V. Projected Work based on Various Funding Levels ..... 54
A. Unlimited Budget ..... 55
B. 5 Year Slurry Budget ..... 71
C. 5 Year Recommended ..... 77

## EXECUTIVE SUMMARY

The Pavement Management Program (PMP) for the City of Coos Bay provides a current inventory, with condition and preservation requirement, for the roadways, and a forecasting of the budget needs.

While the following recommendations have been generated by the Pavement Management Program, they are for planning purposes only and are not intended to replace sound engineering judgment. Final project recommendations should be weighed against the actual approach the City wishes to
 utilize in scheduling the workloads for contracting purposes. In addition, an engineering review of the pavement condition may indicate that a particular pavement section needs attention earlier than the other roads in its localized area.

## - Replacement value \& quantity of pavement

The pavement network within the City of Coos Bay has 67.0 centerline miles of paved surfaces, comprised of 50.4 miles of local, 6.7 miles of collector streets, and 9.9 miles of arterial streets. There is a total of over $11,557,160$ square feet of pavement. The estimated replacement value of this pavement is $\$ 46.9$ million for local/collector streets and $\$ 17.1$ million for arterial/secondary for a total of $\$ 64$ million.

## - Condition of City's pavement

The overall condition of the City of Coos Bay's road network is Fair, with an average "Pavement Condition Index" of 64.3 , with 100 being a brand new street and 0 being a badly deteriorated street with virtually no remaining life.

## - Recommended preservation program and costs.

A strategy was developed to reduce the backlog of street preservation work over the next 5 years and increase the overall condition of the road network. This strategy involves using both slurry seal and pavement resurfacing as preservation components.

Preventative maintenance on streets with better than average PCI ratings must be considered in combination with the more extensive rehabilitation of failing streets to realize the maximum net benefit and reduce the long term costs. The strategies herein were developed to provide alternatives for halting the deterioration of the existing pavement, reducing the backlog of street maintenance work over the next 5 years and improving the overall condition of the roadway network. These strategies generally involve the utilization of crack sealing, patching, slurry sealing, and major work typically consisting of pavement overlays, overlays with fabric, and reconstruction. Future roadway maintenance plans for the City of Coos Bay should be based on the general maintenance strategies developed from this pavement system analysis in combination with the other major contributing factors as discussed previously in this executive summary.

## SECTION I <br> INTRODUCTION

## NEED FOR PAVEMENT MANAGEMENT SYSTEM

A Citywide Pavement Management Program will assist City personnel by providing current technical data to maintain a desirable level of pavement performance, while optimizing the expenditure of limited fiscal resources.

Specifically, the program provides administrators and maintenance personnel with:

- A current inventory of all public roadways
- The current pavement condition for all public roadways
- A project listing of all pavement needing maintenance, rehabilitation, or replacement
- A forecast of budget needs for maintenance, rehabilitation, or replacement of deficient sections of pavement for a 5 year Capital Improvement Program


## THE PAVEMENT NETWORK

The entire pavement network within the City of Coos Bay is comprised of 67.0 centerline miles of paved surface. To assist in planning maintenance needs, the City's road system was broken into classifications based upon their importance in the road network, i.e. functional class such as arterial, collector, and local.

|  |  |  |
| :--- | ---: | ---: |
|  | Current |  |
|  |  |  |
| CLASSIFICATION | Square feet | Cline miles |
| Local/Collector | $9,379,790$ | 57.1 |
| Arterial | $2,177,370$ | 9.9 |
| TOTALS | $11,557,160$ | 67.0 |

The entire pavement network represents a current replacement valuation of over $\$ 66$ million broken down by classification as follows:

|  |  | Total <br> CLASSIFICATION | Square feet | Unit Cost for <br> Replacement of |
| :--- | ---: | ---: | ---: | ---: |
|  |  | Replacement <br> Value | Replacement <br> Value |  |
| Local/Collector | $9,379,790$ | $\$ 5.00$ | $\$ 46,898,950$ | $71 \%$ |
| Arterial | $2,177,370$ | $\$ 8.86$ | $\$ 19,291,498$ | $29 \%$ |
| TOTALS | $11,557,160$ |  | $\$ 66,190,448$ | $100 \%$ |

## CURRENT CONDITIONS

As part of the development of the Pavement Management System for the City of Coos Bay, a visual survey of the pavement network was conducted to assess the existing surface condition of each individual pavement segment. The federal guidelines specified by the Army Corps of Engineers in their Pavement Distress Identification Guide for Asphalt-Surfaced Roads and Parking Lots, dated June 1997, were used as the basis of the visual survey. Upon completion of this survey, a Pavement Condition Index (PCI) was calculated for each segment to reflect overall pavement condition. The PCI system is a rating
 mechanism used to describe the condition of the City's pavement and has been adopted as the nation's standard rating system by AASHTO and ASTM. Ranging between " 0 " and " 100 ," a PCI of " 0 " would correspond to a badly deteriorated pavement with virtually no remaining life, while a PCI of " 100 " would correspond to a pavement with proper engineering design and construction at the beginning of its life cycle.

The table below relates PCI ranges to general pavement condition definitions.

| PCI RANGE | CONDITION |
| :---: | :---: |
| $86-100$ |  |
| $71-85$ | Good |
| $56-70$ |  |
| $41-55$ | Faisfactory |
| $26-40$ | Poor |
| $11-25$ | Very Poor |
| $0-10$ | Serious |
|  | Failed |

## A. PCI Ranges*

* These are the ranges recommended by the U. S. Army Corps of Engineers.

The overall condition of the City of Coos Bay's road network based on current conditions is "Fair" with an average PCI of 64.3.

## ANNUAL BUDGET PROJECTIONS

Based on the results of the condition survey and input from the City, pavement preservation/rehabilitation strategies were developed. A standard agreement at the outset was to identify the City's preservation and maintenance work program for the next 5 years, while reducing the preservation and maintenance backlog and increasing the overall condition of the network.

## RECOMMENDATIONS

The actual workload requirements identified indicate that the street network is currently in good condition. To maintain this condition, it is critical that the preservation activities be funded at the levels identified in the recommended work program to maintain a high network PCI value.

In order to meet these requirements, certain projects have been recommended within the context of this program. The funding requirements just presented are generated in the form of individual projects, as outlined in the Projected Work Reports (Section V).

While the project listings outlined in Section V are the recommendations as generated by the PMS, they are for planning purposes only and are not intended to replace engineering judgment. Before construction has actually started on the pavement work, a field verification should be conducted to ascertain whether conditions still warrant the recommended treatment or whether they have worsened. Final project recommendations should be weighed against the actual approach the City wishes to utilize in scheduling the workloads for contracting purposes. Pavement condition may indicate that a particular pavement section needs attention earlier than the rest of the roads in its localized area.

Because pavement deterioration is a never-ending phenomenon, OMNIS Inc. recommends that all Arterial routes be re-inspected over the course of the next two years. In addition, OMNIS Inc. recommends that all Local roads be re-inspected over the course of the next three years (approximately $33 \%$ of the streets each year). This recommended inspection cycle will fulfill the requirements for GASB 34. The costs for the re-inspection should be included in the annual pavement management budget to assure that the PMS has updated, accurate information.

## SECTION II <br> METHODOLOGY

The following section provides a description of the methodology and rationale utilized in determining the recommended actions identified in this report.

## Field Survey

An inventory of street data for each public roadway within the City of Coos Bay was completed. Data, including distress types and quantities, segment length and width, etc. was collected on all public streets. Using a combination of City street maps and field survey forms to collect field information, a field crew visually surveyed each street. Data was categorized by street and "maintenance" segment. Maintenance segment limits were identified by determining the "logical" maintenance practices that would apply to each street and may vary from street to street, i.e. intersection to intersection, change in pavement type, change in overall pavement condition, change in pavement width, drainage conditions, crown of the roadway, sufficient pavement project areas or quantities, etc. It was determined that sufficient pavement project area and/or length should be at least one mile in length whenever possible. All data collected was entered into the APWA MicroPAVER version 6.5.7 pavement management software.

Segmentation limits are from the curb lip to curb lip. The following Exhibit demonstrates roadway segmentation:


The roadway Main Street is divided into two segments by $2^{\text {nd }}$ Street. The first segment is from the $\mathrm{w} / \mathrm{s}$ (west side) of $3^{\text {rd }}$ Street to the $\mathrm{w} / \mathrm{s}$ (west side) of $2^{\text {nd }}$ Street. The area of the intersection of Main Street and $3^{\text {rd }}$ Street is within this segment. Please note that segmentation begins at the lip of gutter of the crossing roadway. The second segment of Main Street would begin from the e/s (east side) of $2^{\text {nd }}$ Street and end at the e/s (east side) of $1^{\text {st }}$ Street. The area of the intersection of Main Street and $1^{\text {st }}$ Street is within this segment. The area of the intersection of Main Street and $2^{\text {nd }}$ Street would belong to a $2^{\text {nd }}$ Street segment not to Main Street. The $2^{\text {nd }}$ Street segment begins at the $\mathrm{s} / \mathrm{s}$ (south side) of A Street and continues through the intersection of Main Street and $2^{\text {nd }}$ Street and ends at the $\mathrm{s} / \mathrm{s}$ of B Street. The area of the intersection of $2^{\text {nd }}$ Street and B Street is within this segment. It is important to establish the start and stop of roadway segments and to establish intersection allocation to ensure the intersection areas are only quantified once.

After the data entry procedures were completed, a resultant distress rating was calculated for each segment. The distress rating is calculated using an algorithm developed by the Army Corps of Engineers that is recommended by the American Public Works Association and incorporated within the MicroPAVER software. The algorithm begins by giving each pavement section a score of 100 then deducting point values based on the pavement distress found within the section weighted by the quantity of distress. The Army Corps has assigned deduct values based on severity (low, moderate, or high) and the density of each distress, as shown below in the case of alligator (fatigue) cracking. The following chart is an example of an algorithm for alligator cracking in asphalt pavement.


The algorithm weighs the total deducts within a section and calculates a total distress rating between 0 (failed) and 100 (excellent).

The summary of all road condition data and the representative PCI's are located in the Condition Data Report in Section IV.

Once the PCI has been established for a pavement section, the analysis and workload predictions can be commenced. Predictions on future pavement performance are based on a pavement deterioration curve researched and developed by the Army Corps of Engineers. The deterioration curves below shows the expected deterioration rate for typical asphalt (AC). The gray line represent the outer limits of data allowed to be included in creating the curve. Data beyond these limits will be considered anomalies. The yellow lines represent the upper and lower levels of data collected for an area. The green lines represent the deterioration curve for asphalt. Taking the averages of yellow line data creates the green line.


As a pavement ages, the system predicts the PCI of the pavement based on the deterioration curves.

City of Coos Bay
Citywide Pavement Management Program
Final Report - June 2015
Section II
The next step in the analysis is to determine at what point simple maintenance has become major rehabilitation. In the following chart it is suggested that after $75 \%$ of useful life renovation can take place for about $\$ 1.00$ a square foot. If we wait 3 more years or $12 \%$ of life longer the cost is substantially higher at $\$ 4.00$ a square foot.


As you can see by the above graphic, by doing preventative maintenance on a pavement earlier in the pavements life, a substantial amount of money can be saved.

For the City of Coos Bay, it was determined that this critical point of work was as follows:

| AC Streets | Critical <br> Condition |
| :---: | :---: |
| Principal Arterial | 55 |
| Minor Arterial | 55 |
| Collector | 41 |
| Residential | 41 |


| PCC Streets | 10 |
| :--- | :---: |

## MAINTENANCE STRATEGY ASSIGNMENTS

The PCI is used by the system to schedule each pavement segment for maintenance activities. The MicroPAVER program recommends a specific maintenance activity based on the PCI and budget constraints. The MicroPAVER system generates work based on categories of maintenance, such as localized, global and major maintenance. The engineering group has created the following unit costs that are to be reviewed and approved by the City of Coos Bay staff and used for budget scenarios.

## Coos Bay - PMS Update Unit Costs

Estimated Construction Costs
Thin Overlay (2-inch ARHM)

* Assumed sample segment 1,000 feet long $\times 50$ feet wide

| Item | Unit | Quantity | Unit Cost | Extended | Assumptions |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Cold Milling (grinding) | SY | 1,435 | \$2 | \$2,869 | 6 -foot wide edge grind both sides + 12-foot wide grind at |
| Repair Areas (Dig-outs) | SF | 2,500 | \$4 | \$10,000 | 5 percent of pavement area |
| 1/2-inch Leveling Course | TON | 156 | \$140 | \$21,875 |  |
| 1 1/2-inch ARHM Overlay | TON | 469 | \$140 | \$65,625 |  |
| Utility Cover Adjustment | EACH | 5 | \$500 | \$2,500 | Average 1 utility cover per 200 lineal feet of roadway |
| Traffic Striping and Markings | LF | 3,167 | \$1 | \$3,167 | 12-foot lane widths |
| Traffic Control | LS | 1 | - | \$3,086 | 3 percent of construction cost |
| Subtotal \$109,122 |  |  |  |  |  |
| Contingency (20\%) = \$21,824 |  |  |  |  |  |
| Total $=$ \$130,946 |  |  |  |  |  |
| \$/SF = \$2.62 |  |  |  |  |  |

## Reconstruction (5-inch AC on 6-inch AB)

* Assumed sample segment 1,000 feet long $\times 50$ feet wide



## Slurry Seal

* Assumed sample segment 1,000 feet long $\times 50$ feet wide

| Item | Unit | Quantity | Unit Cost | Extended | Assumptions |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Repair Areas (Dig-outs) | SF | 1,000 | \$4 | \$4,000 | 2 percent of pavement area |
| Slurry Seal | SY | 5,556 | \$1.75 | \$9,722 |  |
| Traffic Striping and Markings | LF | 3,167 | \$1 | \$3,167 | 12-foot lane widths |
| Traffic Control | LS | 1 | $\square$ | \$412 | 3 percent of construction cost |
|  |  |  | Subtotal $=$ | \$17,301 |  |
|  |  | Contingen | (20\%) = | \$3,460 |  |
|  |  |  | Total $=$ $\$ / \mathrm{SF}=$ | $\begin{array}{r} \hline 20,761 \\ \$ 0.42 \end{array}$ |  |


|  | Thin Overlay |  | Reconst. | Slurry <br> Seal |
| :---: | :---: | :---: | :---: | :---: |
| Construction | \$/SF | \$2.62 | \$6.90 | \$0.42 |
| Design | 10.00\% | \$0.26 | \$0.69 | \$0.04 |
| Inspection/Testing/Survey | 10.00\% | \$0.26 | \$0.69 | \$0.04 |
| Construction Management | 3.50\% | \$0.09 | \$0.24 | \$0.01 |
| City Administration | 5.00\% | \$0.13 | \$0.34 | \$0.02 |
|  |  | \$3.37 | \$8.86 | \$0.53 |

## MAINTENANCE \& REPAIR DECISIONS

Once the activities were chosen and unit costs were defined, budgets and work assignments were generated for each work program on an annual basis. Using the pavement deterioration curves for each type of pavement surface and class of road, both current year and future years work requirements for each pavement segment within the City were determined. The current PCI is reduced annually based on the deterioration curve, maintenance activities increase the PCI value as they are applied to the segment. The overall program is dynamic in that each strategy consists of a cyclic series of actions that simulates pavement's anticipated life cycle.

## PROJECTED WORK PROGRAMS

In developing an annual expenditure level required to maintain the street network at its current average PCI level, three (3) budget scenarios were studied. The budget scenarios should be utilized in conjunction with each other by City staff to consider possible plans for the maintenance strategies within the City. The City of Coos Bay has a Fair PCI rating citywide of 64.3. The budget scenarios are as follows:

UNLIMITED BUDGET - Unlimited Budget scenario is the amount of money necessary to complete all of the maintenance required each year for the entire roadway network. The City of Coos Bay's backlog of maintenance is approximately $\$ 19.6$ million.

5 YEAR SLURRY SEAL BUDGET - 5 YEAR SLURRY SEAL Budget scenario is the amount of money recommended for the Slurry Seal maintenance required each year for the entire roadway network. The recommended slurry seal budget for the City of Coos Bay is approximately $\$ 250,000$.

RECOMMENDED BUDGET -Recommended Budget scenario is the city staff budget of $\$ 750 \mathrm{~K}$ a year for five years for a total budget of $\$ 3.75$ Million. Maintenances include thin overlay, overlay, reconstruction, and slurry seals.

Network PCI levels were determined on an annual basis for each of the budget scenarios outlined above with the results shown in Section V. For a summary of the work program costs, see Section V.

## PAVEMENT MANAGEMENT SYSTEM REPORTS

In addition to the annual budgets, this report contains a comprehensive assemblage of pavement management reports ranging from summary reports to annual maintenance and rehabilitation schedules. Collectively, as well as individually, the reports represent reasonable projections of pavement maintenance needs and performance based on visual condition assessments, unit cost estimates, and pavement deterioration models.

It is important to note that pavement segment dimensions and surface area, along with the action and repair costs, as presented on the reports, are accurate within tolerable limits. This is noteworthy due to the "implied" accuracy of reporting length and width to the nearest foot, surface area to the nearest square foot, and action and repair unit costs and project estimates to the nearest penny and dollar, respectively.

## SYSTEM MAINTENANCE

The City needs to maintain its commitment to the preventive maintenance system, while working toward reducing the City's present backlog of rehabilitation projects.

In order to ensure that report outputs are accurate and credible, it is essential that the integrity of all data files be maintained. This will require performing all necessary updates when changes are made to scheduling scenarios, unit cost information, historical data, etc. In addition, the entire pavement network will have to be re-inventoried at regular intervals. This will not only allow work to be scheduled based on the most current condition data available, but will provide City personnel with a means to monitor actual rates of pavement deterioration so appropriate modifications can be made to the system curves.

## SECTION III CONDITION DISTRIBUTION REPORT

This report graphically depicts the distribution of the pavement condition throughout the street network by area. The condition ranges from "Failed" to "Excellent", with an "Excellent" condition corresponding to a pavement at the beginning of its life cycle, and a "Failed" condition representing a badly deteriorated pavement with virtually no remaining life. The City of Coos Bay has a "Good" overall pavement network condition rating with a network wide average PCI rating of 64.1. The tables on the following pages show the general description for each pavement condition:

| Condition | PCI Range | Description |
| :--- | :---: | :--- |
| Good | $86-100$ | No significant distress. |
| Satisfactory | $71-85$ | Little distress, with the exception of utility patches in good condition, or <br> slight hairline cracks; may be slightly weathered. |
| Fair | $56-70$ | Slight to moderately weathered, slight distress, possibly patching. |
| Poor | $41-55$ | Severely weathered or slight to moderate levels of distress generally <br> limited to patches and non-load-related cracking. |
| Very Poor | $26-40$ | Moderate to severe distresses including load-related types, such as <br> alligator cracking. |
| Serious | $11-25$ | Severely distressed or large quantities of distortion or alligator cracking. |
| Failed | $0-10$ | Failure of the pavement, distress has surpassed tolerable rehabilitation <br> limits. |



## System Condition Distribution (Arterial Streets)





## SECTION IV <br> PAVEMENT CONDITION INDEX (PCI) REPORT

OMNIS Inc submits two (2) PCI Reports alphabetically and by PCI rating. The alphabetically report is listed by street name, this report provides the City with a listing of pertinent inventory and pavement condition data for each pavement section within the City's pavement network. The Pavement Condition Index (PCI) Report notes the names, limits, classification, dimension, pavement class and PCI as of the last inspection for each pavement section. The PCI rating report is listed by condition rating descending and includes the same information that is within the alphabetical report.

Detailed descriptions of the information appearing on this report are presented below:
Branch Name - The name of each pavement section appears in this column. Generally, the pavement section name is taken directly from a street sign; however, where no street signs are posted, the name appearing on the network map is noted instead.

Section Number - The street segmentation is numbered in this column. The length limitations are approximately 1300 linear feet for residentials and 2600 linear feet for arterials.

From - A description of the beginning limit of each pavement section appears in this column. The limit will note the side of the boundary street from which the segment was taken (e.g., "N/S MAIN ST" refers to the north side of the intersection at Main St). If the beginning limit exists between intersections, then the beginning limit description may be an address, post mile marker, or a distance from a known point of reference (e.g., "500' N/O MAIN ST").

To - A description of the ending limit of each pavement section appears in this column. The description may consist of a street name, an address, or a distance from a known point of reference as described in the above section.

Surface - A code was assigned to each pavement section to describe surface type.

| CODE | DESCRIPTION |
| :--- | :--- |
| AC | Asphalt Concrete |
| PCC | Portland Cement Concrete |

Rank - The rank of each pavement section appears in this column. Typically, street segments are classified according to traffic volume or the agency's circulation element.

| CODE |  | DESCRIPTION |
| :--- | :--- | :--- |
|  |  | Primary Arterial |
| C |  | Collector |
| E |  | Local/Residential |

Lanes - The number of lanes in the pavement section.

Length - The length of the pavement section.
Width - The width of the pavement section.
Shoulder - The shoulder of each pavement section appears in this column. The following codes were used in the database

| CODE | DESCRIPTION |
| :--- | :--- |
| C\&G | Curb \& Gutter |
| CUR | Curb Only |
| NON | Edge of Pavement Only |

Surface - The surface of each pavement section appears in this column. The following codes were used in the database

| CODE | DESCRIPTION |
| :--- | :--- |
|  | Asphalt Concrete |
| PCC | Portland Concrete Cement |

PCI - Pavement Condition Indexes were calculated for pavement sections based on severity and extent of distress manifestations observed within the pavement section. Ranging between 0 and 100, a PCI of " 100 " corresponds to a pavement at the beginning of its life cycle, while a PCI of " 0 " corresponds to a badly deteriorated pavement which is at or near the end of its life cycle.

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH AVENUE | 1 | D ST S/S | E ST N/S | 2 | 435 | 23 | 10,005.00 | E | NON | 58 |
| 10TH AVENUE | 2 | E ST S/S | F ST N/S | 2 | 435 | 26 | 11,310.00 | E | NON | 65 |
| 10TH AVENUE | 3 | F ST S/S | END | 2 | 385 | 24 | 9,240.00 | E | NON | 93 |
| 10TH COURT | 1 | DATE AVE N/S | END | 2 | 560 | 23 | 12,880.00 | E | NON | 42 |
| 10TH COURT | 2 | HEMLOCK AVE N/S | END | 2 | 240 | 14 | 3,360.00 | E | NON | 76 |
| 10TH COURT | 3 | F ST S/S | END | 2 | 125 | 12 | 1,500.00 | E | NON | 95 |
| 10TH STREET | 1 | ELROD AVE N/S | CENTRAL AVE S/S | 2 | 1,285.00 | 35 | 44,975.00 | C | CUR | 73 |
| 10TH STREET | 2 | CENTRAL AVE N/S | 180' N/O COMMERCIAL AVE | 2 | 500 | 35 | 17,500.00 | A | CUR | 81 |
| 10TH STREET | 3 | 180' N/O COMMERCIAL AVE | 8TH TER S/S | 2 | 435 | 28 | 12,180.00 | A | CUR | 83 |
| 10TH STREET | 4 | 8TH TER S/S | DATE AVE N/S | 2 | 1,085.00 | 29 | 31,465.00 | A | C\&G | 81 |
| 10TH STREET | 5 | DATE AVE N/S | HEMLOCK AVE N/S | 2 | 1,215.00 | 25 | 30,375.00 | A | C\&G | 83 |
| 10TH STREET | 6 | HEMLOCK AVE N/S | KOOSBAY BL S/S | 2 | 810 | 35 | 28,350.00 | A | CUR | 81 |
| 10TH STREET | 7 | JOHNSON AVE N/S | SOUTHWEST BL N/S | 2 | 1,525.00 | 22 | 33,550.00 | A | CUR | 53 |
| 10TH STREET | 8 | ELROD AVE S/S | END | 2 | 675 | 22 | 14,850.00 | E | CUR | 25 |
| 10TH STREET | 9 | INGERSOLL AVE S/S | JOHNSON AVE N/S | 2 | 560 | 22 | 12,320.00 | A | CUR | 53 |
| 11TH AVENUE | 1 | F ST S/S | END | 2 | 200 | 23 | 4,600.00 | E | NON | 95 |
| 11TH AVENUE | 2 | F ST N/S | E ST S/S | 2 | 435 | 24 | 10,440.00 | E | NON | 50 |
| 11TH COURT | 1 | F ST S/S | END | 2 | 135 | 17 | 2,295.00 | E | NON | 95 |
| 11TH STREET | 1 | INGERSOLL AVE N/S | FERGUSON AVE N/S | 2 | 1,475.00 | 36 | 53,100.00 | E | C\&G | 82 |
| 11TH STREET | 2 | FERGUSON AVE N/S | ELROD AVE S/S | 2 | 230 | 35 | 8,050.00 | E | CUR | 40 |
| 11TH STREET | 3 | SPRUCE AVE N/S | END SOUTH | 2 | 325 | 18 | 5,850.00 | E | CUR | 75 |
| 11TH STREET | 4 | INGERSOLL AVE S/S | END | 2 | 350 | 16 | 5,600.00 | E | NON | 50 |
| 11TH STREET | 5 | CENTRAL AVE N/S | 100' N/O CENTRAL | 2 | 100 | 26 | 2,600.00 | E | CUR | 15 |
| 11TH STREET | 6 | 100' N/O CENTRAL AVE | 100' N/O COMMERCIAL AVE | 2 | 350 | 25 | 8,750.00 | E | C\&G | 100 |
| 11TH STREET | 7 | 100' N/O COMMERCIAL AVE | PARK AVE N/S | 2 | 515 | 24 | 12,360.00 | E | CUR | 45 |
| 12TH AVENUE | 1 | F ST S/S | END | 2 | 205 | 23 | 4,715.00 | E | NON | 95 |
| 12TH AVENUE | 2 | F ST N/S | E ST S/S | 2 | 435 | 24 | 10,440.00 | E | NON | 65 |
| 12TH COURT | 1 | FERGUSON AVE N/S | END | 2 | 405 | 21 | 8,505.00 | E | CUR | 61 |
| 12TH COURT | 2 | F ST N/S | E ST S/S | 2 | 425 | 16 | 6,800.00 | E | NON | 59 |
| 12TH STREET | 1 | INGERSOLL AVE N/S | END | 2 | 210 | 30 | 6,300.00 | E | NON | 68 |
| 12TH STREET | 2 | ELROD ST S/S | END | 2 | 525 | 18 | 9,450.00 | E | CUR | 36 |
| 12TH STREET | 3 | YEW AVE N/S | CITY LIMITS | 2 | 200 | 30 | 6,000.00 | E | NON | 50 |
| 12TH STREET | 4 | PARK AVE N/S | BIRCH AVE N/S | 2 | 555 | 24 | 13,320.00 | E | CUR | 43 |
| 12TH STREET | 5 | CENTRAL AVE N/S | COMMERCIAL AVE N/S | 2 | 355 | 45 | 12,975.00 | E | CUR | 95 |
| 12TH STREET | 6 | COMMERCIAL AVE N/S | 12TH TER N/S | 2 | 325 | 45 | 12,125.00 | E | CUR | 43 |
| 13TH AVENUE | 1 | D ST S/S | END | 2 | 300 | 23 | 6,900.00 | E | NON | 68 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCl |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 13TH AVENUE | 2 | F ST S/S | END | 2 | 245 | 22 | 5,390.00 | E | C\&G | 95 |
| 13TH AVENUE | 3 | F ST N/S | END | 2 | 325 | 28 | 9,100.00 | E | NON | 85 |
| 13TH COURT | 1 | F ST S/S | END | 2 | 80 | 15 | 1,200.00 | E | NON | 95 |
| 13TH COURT | 2 | F ST N/S | END | 2 | 305 | 18 | 5,490.00 | E | NON | 79 |
| 13TH STREET | 1 | JUNIPER AVE S/S | HEMLOCK AVE S/S | 2 | 340 | 32 | 10,880.00 | E | CUR | 65 |
| 13TH STREET | 2 | BIRCH AVE S/S | ADLER AVE N/S | 2 | 235 | 25 | 5,875.00 | E | CUR | 83 |
| 13TH STREET | 3 | HIGHLAND AVE S/S | COMMERCIAL AVE N/S | 2 | 335 | 19 | 6,365.00 | E | NON | 75 |
| 14TH AVENUE | 1 | F ST N/S | D ST S/S | 2 | 900 | 25 | 22,500.00 | E | NON | 93 |
| 14TH COURT | 1 | D ST N/S | END | 2 | 200 | 13 | 2,600.00 | E | NON | 75 |
| 14TH STREET | 1 | JUNIPER AVE N/S | MYRTLE AVE S/S | 2 | 925 | 30 | 27,750.00 | E | CUR | 74 |
| 14TH STREET | 2 | MYRTLE AVE S/S | NUTWOOD AVE S/S | 2 | 375 | 36 | 13,500.00 | E | CUR | 35 |
| 14TH STREET | 3 | NUTWOOD AVE S/S | TEAKWOOD AVE S/S | 2 | 1,155.00 | 36 | 41,580.00 | E | CUR | 59 |
| 14TH STREET | 4 | JUNIPER AVE S/S | PARK AVE N/S | 2 | 675 | 30 | 20,250.00 | E | CUR | 20 |
| 14TH STREET | 5 | CEDAR AVE S/S | BIRCH AVE N/S | 2 | 250 | 29 | 7,250.00 | E | C\&G | 85 |
| 14TH STREET | 6 | F ST N/S | I ST S/S | 2 | 1,220.00 | 23 | 28,060.00 | E | NON | 86 |
| 14TH STREET | 7 | COMMERCIAL AVE S/S | HIGHLAND AVE S/S | 2 | 360 | 42 | 11,120.00 | E | NON | 95 |
| 15TH COURT | 1 | THOMPSON RD N/S | END | 2 | 530 | 25 | 13,250.00 | E | NON | 61 |
| 15TH STREET | 1 | THOMPSON RD N/S | END | 2 | 620 | 27 | 16,740.00 | E | NON | 78 |
| 15TH STREET | 2 | MYRTLE AVE N/S | END | 2 | 320 | 31 | 9,920.00 | E | CUR | 68 |
| 15TH STREET | 3 | MYRTLE AVE S/S | END | 2 | 425 | 32 | 13,600.00 | E | NON | 61 |
| 16TH AVENUE | 1 | EVERGREEN ST S/S | COOS RIVER HWY S/S | 2 | 1,365.00 | 28 | 38,220.00 | E | NON | 93 |
| 16TH COURT | 1 | THOMPSON RD N/S | END | 2 | 50 | 15 | 750 | E | NON | 74 |
| 16TH STREET | 1 | CALIFORNIA AVE N/S | END | 2 | 350 | 27 | 9,450.00 | E | C\&G | 84 |
| 16TH STREET | 2 | MYRTLE AVE S/S | KINGWOOD AVE N/S | 2 | 445 | 34 | 15,130.00 | E | CUR | 81 |
| 17TH STREET | 1 | THOMPSON RD N/S | END | 2 | 160 | 50 | 6,800.00 | E | C\&G | 59 |
| 17TH STREET | 2 | MYRTLE AVE S/S | KINGWOOD AVE N/S | 2 | 400 | 35 | 14,000.00 | E | CUR | 78 |
| 17TH STREET | 3 | I ST N/S | EVERGREEN ST N/S | 2 | 1,275.00 | 22 | 28,050.00 | E | NON | 64 |
| 18TH AVENUE | 1 | FILBERT AVE S/S | END | 2 | 250 | 23 | 5,750.00 | E | NON | 43 |
| 18TH AVENUE | 2 | FILBERT AVE N/S | CDS | 2 | 595 | 25 | 15,875.00 | E | NON | 82 |
| 19TH STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 660 | 33 | 21,780.00 | E | C\&G | 62 |
| 19TH STREET | 2 | OCEAN BL N/S | JUNIPER AVE S/S | 2 | 465 | 28 | 13,020.00 | E | CUR | 56 |
| 19TH STREET | 3 | JUNIPER AVE S/S | COTTONWOOD AVE S/S | 2 | 290 | 28 | 8,120.00 | E | CUR | 69 |
| 19TH STREET | 4 | THOMPSON RD S/S | END | 2 | 650 | 33 | 21,450.00 | E | C\&G | 73 |
| 19TH STREET | 5 | OCEAN BL S/S | TIMBERLINE DR S/S | 2 | 205 | 35 | 7,175.00 | E | C\&G | 83 |
| 1ST AVENUE | 1 | FINK ST N/S | D ST S/S | 2 | 200 | 24 | 4,800.00 | E | NON | 81 |
| 1ST AVENUE | 2 | D ST N/S | A ST N/S | 2 | 1,315.00 | 30 | 39,450.00 | E | NON | 57 |


| Name | $\begin{gathered} \text { Section } \\ \text { ID } \end{gathered}$ | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1STCOURT | 1 | A ST S/S | END | 2 | 135 | 13 | 1,755.00 | E | NON | 63 |
| 20TH STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 420 | 20 | 8,400.00 | E | C\&G | 83 |
| 20TH STREET | 2 | WOODLAND DR N/S | JUNIPER AVE S/S | 2 | 380 | 35 | 13,300.00 | E | CUR | 53 |
| 21ST STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 215 | 16 | 3,440.00 | E | NON | 83 |
| 22ND STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 360 | 21 | 7,560.00 | E | C\&G | 95 |
| 28TH COURT | 2 | OCEAN BL S/S | TWIG TER S/S | 2 | 900 | 26 | 23,400.00 | E | CUR | 82 |
| 2ND AVENUE | 1 | D ST S/S | E ST N/S | 2 | 330 | 33 | 10,890.00 | E | NON | 37 |
| 2ND AVENUE | 02A | D ST N/S | B ST S/S | 2 | 890 | 25 | 22,250.00 | E | CUR | 28 |
| 2ND AVENUE | 02B | D ST N/S | B ST S/S | 2 | 890 | 25 | 22,250.00 | E | NON | 55 |
| 2ND AVENUE | 03A | B ST S/S | A ST S/S | 2 | 470 | 16 | 7,520.00 | E | NON | 25 |
| 2ND AVENUE | 03B | B ST S/S | A ST S/S | 2 | 470 | 16 | 7,520.00 | E | NON | 85 |
| 2ND COURT | 1 | 2ND ST W/S | 4TH ST W/S | 2 | 475 | 25 | 11,875.00 | E | CUR | 37 |
| 2ND STREET | 1 | LOCKHART AVE N/S | KRUSE AVE S/S | 2 | 535 | 36 | 19,260.00 | E | C\&G | 43 |
| 2ND STREET | 2 | KRUSE AVE N/S | JOHNSON AVE S/S | 2 | 535 | 39 | 20,865.00 | E | CUR | 52 |
| 2ND STREET | 3 | JOHNSON AVE N/S | HALL AVE S/S | 2 | 1,110.00 | 38 | 42,180.00 | E | CUR | 50 |
| 2ND STREET | 4 | HALL AVE S/S | GOLDEN AVE S/S | 2 | 525 | 54 | 28,350.00 | E | CUR | 44 |
| 2ND STREET | 5 | GOLDEN AVE N/S | ELROD AVE S/S | 2 | 525 | 55 | 28,875.00 | E | CUR | 52 |
| 2ND STREET | 6 | ELROD AVE N/S | CURTIS AVE S/S | 2 | 520 | 36 | 18,720.00 | E | CUR | 33 |
| 2ND STREET | 7 | CURTIS AVE N/S | ANDERSON AVE S/S | 2 | 465 | 38 | 21,470.00 | E | CUR | 78 |
| 2ND STREET | 8 | PARK AVE N/S | ALDER AVE S/S | 2 | 255 | 26 | 6,630.00 | E | CUR | 13 |
| 2ND STREET | 9 | ANDERSON AVE N/S | CENTRAL AVE S/S | 2 | 220 | 30 | 6,600.00 | E | C\&G | 84 |
| 2ND STREET | 10 | CENTRAL AVE N/S | COMMERCIAL AVE S/S | 2 | 220 | 30 | 6,600.00 | E | C\&G | 75 |
| 2ND STREET | 11 | COMMERCIAL AVE N/S | MARKET AVE S/S | 2 | 215 | 41 | 8,815.00 | E | C\&G | 75 |
| 2ND STREET | 12 | MARKET AVE N/S | PARK AVE S/S | 2 | 435 | 36 | 15,660.00 | E | C\&G | 56 |
| 32ND STREET | 1 | N/S WALNUT AVE | LINDBERG AVE S/S | 2 | 380 | 33 | 12,540.00 | E | C\&G | 83 |
| 33RD STREET | 1 | N/S WALNUT AVE | LINDBERG AVE S/S | 2 | 400 | 33 | 13,200.00 | E | C\&G | 86 |
| 34TH STREET | 1 | LINDBERG AVE S/S | OCEAN BL N/S | 2 | 1,195.00 | 36 | 43,020.00 | E | C\&G | 72 |
| 35TH STREET | 1 | VINE AVE N/S | LINDBERG AVE S/S | 2 | 665 | 33 | 18,645.00 | E | C\&G | 75 |
| 3RD AVENUE | 1 | D ST S/S | E ST N/S | 2 | 355 | 24 | 8,520.00 | E | NON | 78 |
| 3RD COURT | 1 | DATE AVE N/S | END | 2 | 415 | 15 | 6,225.00 | E | NON | 83 |
| 3RD STREET | 1 | BIRCH AVE N/S | PARK AVE N/S | 2 | 510 | 17 | 8,670.00 | E | CUR | 25 |
| 3RD STREET | 2 | CENTRAL AVE S/S | ANDERSON AVE N/S | 2 | 225 | 28 | 6,300.00 | E | C\&G | 78 |
| 3RD STREET | 3 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | 2 | 220 | 29 | 6,380.00 | E | C\&G | 82 |
| 4TH AVENUE | 1 | E ST N/S | D ST S/S | 2 | 435 | 22 | 9,570.00 | E | NON | 71 |
| 4TH AVENUE | 2 | D ST N/S | END | 2 | 495 | 25 | 12,375.00 | E | NON | 48 |
| 4TH COURT | 1 | HIGHLAND AVE N/S | PARK AVE S/S | 2 | 235 | 18 | 4,230.00 | E | CUR | 51 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4TH COURT | 2 | PARK AVE N/S | 205' N/O PARK AVE | 2 | 205 | 18 | 3,690.00 | E | CUR | 66 |
| 4TH COURT | 3 | 205' N/O PARK AVE | END | 2 | 715 | 18 | 12,870.00 | E | CUR | 54 |
| 4TH STREET | 1 | LOCKHART AVE N/S | KRUSE AVE N/S | 2 | 570 | 44 | 25,080.00 | C | CUR | 77 |
| 4TH STREET | 2 | KRUSE AVE N/S | JOHNSON AVE N/S | 2 | 535 | 42 | 22,470.00 | C | C\&G | 84 |
| 4TH STREET | 3 | JOHNSON AVE N/S | GOLDEN AVE S/S | 2 | 1,685.00 | 42 | 70,770.00 | C | CUR | 84 |
| 4TH STREET | 4 | GOLDEN AVE S/S | CURTIS AVE S/S | 2 | 1,140.00 | 54 | 62,560.00 | C | CUR | 74 |
| 4TH STREET | 5 | CURTIS AVE S/S | ANDERSON AVE S/S | 2 | 495 | 63 | 31,185.00 | C | CUR | 85 |
| 4TH STREET | 6 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | 2 | 480 | 53 | 25,440.00 | C | C\&G | 66 |
| 4TH STREET | 7 | COMMERCIAL AVE N/S | MARKET AVE S/S | 3 | 215 | 52 | 11,180.00 | C | C\&G | 69 |
| 4TH STREET | 8 | MARKET AVE N/S | HIGHLAND AVE S/S | 2 | 180 | 26 | 4,680.00 | E | CUR | 33 |
| 4TH STREET | 9 | HIGHLAND AVE N/S | PARK AVE S/S | 2 | 230 | 24 | 5,520.00 | E | CUR | 58 |
| 4TH STREET | 10 | 2ND CT N/S | FIR AVE N/S | 2 | 120 | 20 | 2,400.00 | E | NON | 83 |
| 5TH AVENUE | 1 | D ST N/S | END | 2 | 220 | 25 | 5,500.00 | E | NON | 76 |
| 5TH AVENUE | 2 | D ST S/S | E ST N/S | 2 | 435 | 23 | 10,005.00 | E | NON | 64 |
| 5TH STREET | 1 | HIGHLAND AVE N/S | MARKET AVE N/S | 2 | 210 | 33 | 6,930.00 | E | C\&G | 52 |
| 5TH STREET | 2 | MARKET AVE N/S | COMMERCIAL AVE N/S | 2 | 255 | 34 | 8,670.00 | E | C\&G | 95 |
| 5TH STREET | 5 | GOLDEN AVE S/S | HALL AVE N/S | 2 | 540 | 26 | 14,040.00 | E | CUR | 13 |
| 5TH STREET | 6 | HALL AVE S/S | INGERSOLL AVE N/S | 2 | 545 | 28 | 15,260.00 | E | CUR | 46 |
| 5TH STREET | 7 | INGERSOLL AVE N/S | JOHNSON AVE N/S | 2 | 570 | 27 | 15,390.00 | E | CUR | 32 |
| 5TH STREET | 8 | JOHNSON AVE S/S | KRUSE AVE N/S | 2 | 545 | 24 | 13,080.00 | E | NON | 20 |
| 5TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | 2 | 565 | 38 | 21,470.00 | E | CUR | 57 |
| 5TH STREET | 10 | FIR AVE N/S | END | 2 | 115 | 20 | 2,300.00 | E | NON | 17 |
| 5TH STREET | 11 | DONNELLY AVE N/S | BENNETT AVE S/S | 2 | 510 | 31 | 15,810.00 | E | CUR | 59 |
| 5TH STREET | 12 | BENNETT AVE N/S | ANDERSON AVE S/S | 2 | 220 | 36 | 7,920.00 | E | CUR | 70 |
| 5TH STREET | 13 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | 2 | 475 | 36 | 19,900.00 | E | CUR | 65 |
| 6TH STREET | 1 | COMMERCIAL AVE S/S | ANDERSON AVE N/S | 2 | 480 | 38 | 18,240.00 | E | C\&G | 45 |
| 6TH STREET | 2 | ANDERSON AVE S/S | BENNETT AVE N/S | 2 | 225 | 28 | 6,300.00 | E | CUR | 66 |
| 6TH STREET | 3 | BENNETT AVE S/S | ELROD AVE N/S | 2 | 770 | 24 | 18,480.00 | E | CUR | 70 |
| 6TH STREET | 4 | ELROD AVE S/S | CDS | 2 | 305 | 24 | 7,920.00 | E | CUR | 77 |
| 6TH STREET | 5 | IVY AVE N/S | KOOSBAY BL S/S | 2 | 430 | 41 | 17,630.00 | E | C\&G | 55 |
| 6TH STREET | 6 | KOOSBAY BL N/S | KINGWOOD AVE S/S | 2 | 320 | 41 | 13,120.00 | E | CUR | 65 |
| 6TH STREET | 7 | KINGWOOD AVE N/S | MYRTLE AVE S/S | 2 | 325 | 41 | 13,325.00 | E | C\&G | 66 |
| 6TH STREET | 8 | MYRTLE AVE S/S | PINE AVE S/S | 2 | 745 | 41 | 30,545.00 | E | C\&G | 85 |
| 7TH AVENUE | 1 | F ST N/S | E ST S/S | 2 | 415 | 22 | 9,130.00 | E | NON | 46 |
| 7TH AVENUE | 2 | E ST N/S | D ST S/S | 2 | 435 | 30 | 13,050.00 | E | NON | 74 |
| 7TH AVENUE | 3 | D ST N/S | END | 2 | 240 | 22 | 5,280.00 | E | NON | 75 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7TH AVENUE | 4 | I ST N/S | H ST N/S | 2 | 260 | 14 | 3,640.00 | E | NON | 77 |
| 7TH COURT | 1 | FIR AVE N/S | END | 2 | 215 | 20 | 4,300.00 | E | NON | 57 |
| 7TH ROAD | 1 | FIR AVE S/S | 3RD CT N/S | 2 | 185 | 35 | 6,475.00 | E | C\&G | 76 |
| 7TH ROAD | 2 | 3RD CT N/S | DATE AVE N/S | 2 | 485 | 33 | 16,005.00 | E | C\&G | 67 |
| 7TH STREET | 1 | KOOSBAY BL N/S | KINGWOOD AVE N/S | 2 | 325 | 38 | 12,350.00 | E | C\&G | 15 |
| 7TH STREET | 2 | ANDERSON AVE S/S | DONNELLY AVE N/S | 2 | 765 | 34 | 26,010.00 | E | CUR | 60 |
| 7TH STREET | 3 | DONNELLY AVE N/S | ELROD AVE N/S | 2 | 255 | 36 | 9,180.00 | E | CUR | 77 |
| 7TH STREET | 4 | ELROD AVE N/S | FERGUSON AVE S/S | 2 | 290 | 36 | 10,440.00 | E | CUR | 66 |
| 7TH STREET | 5 | FERGUSON AVE S/S | HALL ST N/S | 2 | 865 | 39 | 33,735.00 | E | CUR | 74 |
| 7TH STREET | 6 | HALL ST N/S | INGERSOLL AVE S/S | 2 | 630 | 39 | 24,570.00 | E | CUR | 83 |
| 7TH STREET | 7 | INGERSOLL AVE S/S | JOHNSON AVE S/S | 2 | 570 | 33 | 18,810.00 | E | C\&G | 54 |
| 7TH STREET | 8 | JOHNSON AVE S/S | KRUSE AVE N/S | 2 | 545 | 33 | 17,985.00 | E | C\&G | 61 |
| 7TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | 2 | 565 | 33 | 18,645.00 | A | C\&G | 52 |
| 7TH STREET | 10 | HEMLOCK AVE S/S | END | 2 | 675 | 32 | 21,600.00 | E | C\&G | 76 |
| 7TH STREET | 11 | HEMLOCK AVE N/S | IVY AVE N/S | 2 | 250 | 37 | 9,250.00 | E | C\&G | 84 |
| 7TH STREET | 12 | PINE AVE S/S | END | 2 | 460 | 37 | 17,020.00 | E | CUR | 47 |
| 7TH STREET | 13 | HEMLOCK AVE S/S | END | 2 | 315 | 33 | 10,395.00 | E | C\&G | 75 |
| 7TH TERRACE | 1 | 8TH ST E/S | END | 2 | 120 | 15 | 1,800.00 | E | C\&G | 0 |
| 8TH AVENUE | 1 | D ST N/S | END | 2 | 175 | 20 | 3,500.00 | E | NON | 56 |
| 8TH AVENUE | 2 | D ST S/S | E ST N/S | 2 | 435 | 22 | 9,570.00 | E | NON | 75 |
| 8TH AVENUE | 3 | E ST S/S | F ST N/S | 2 | 420 | 25 | 10,500.00 | E | NON | 51 |
| 8TH LOOP | 1 | BIRCH AVE N/S | 8TH ST W/S | 2 | 330 | 22 | 7,260.00 | E | CUR | 78 |
| 8TH STREET | 1 | FIR AVE N/S | HEMLOCK AVE S/S | 2 | 695 | 33 | 22,935.00 | E | CUR | 58 |
| 8TH STREET | 2 | HEMLOCK AVE S/S | KOOSBAY BL S/S | 2 | 590 | 25 | 14,750.00 | E | CUR | 24 |
| 8TH STREET | 3 | KOOSBAY BL N/S | END | 2 | 680 | 33 | 22,440.00 | E | CUR | 49 |
| 8TH STREET | 5 | PINE AVE S/S | REDWOOD AVE N/S | 2 | 355 | 32 | 11,360.00 | E | CUR | 52 |
| 8TH STREET | 6 | TEAKWOOD AVE N/S | END | 2 | 380 | 13 | 4,940.00 | E | NON | 60 |
| 8TH STREET | 7 | FERGUSON AVE N/S | ELROD AVE S/S | 2 | 230 | 26 | 5,980.00 | E | CUR | 25 |
| 8TH STREET | 8 | ELROD AVE N/S | DONNELLY AVE S/S | 2 | 225 | 26 | 5,850.00 | E | CUR | 25 |
| 8TH STREET | 9 | JOHNSON AVE S/S | END | 2 | 525 | 29 | 15,225.00 | E | CUR | 71 |
| 8TH STREET | 10 | JOHNSON AVE N/S | INGERSOLL AVE S/S | 2 | 525 | 29 | 15,225.00 | E | CUR | 25 |
| 8TH STREET | 11 | COMMERCIAL AVE N/S | 8TH TERR N/S | 2 | 270 | 32 | 8,640.00 | E | CUR | 73 |
| 8TH STREET | 12 | 8TH TERR N/S | 7TH TERR S/S | 2 | 250 | 26 | 6,500.00 | E | CUR | 49 |
| 8TH STREET | 13 | DATE AVE S/S | BIRCH AVE S/S | 2 | 660 | 26 | 17,160.00 | E | CUR | 76 |
| 8TH STREET | 14 | ANDERSON AVE S/S | END | 2 | 550 | 36 | 19,800.00 | E | CUR | 95 |
| 8TH STREET | 15 | ANDERSON AVE N/S | CENTRAL AVE S/S | 2 | 320 | 25 | 8,000.00 | E | CUR | 19 |

City of Coos Bay
PCI Report 2015
Alphabetical

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 8TH STREET | 16 | CENTRAL AVE N/S | COMMERCIAL AVE S/S | 2 | 320 | 26 | 8,320.00 | E | CUR | 51 |
| 8TH TERRACE | 1 | 8TH ST W/S | 10TH ST E/S | 2 | 640 | 25 | 16,000.00 | E | CUR | 76 |
| 9TH AVENUE | 1 | E ST N/S | D ST S/S | 2 | 435 | 36 | 15,660.00 | E | NON | 65 |
| 9TH AVENUE | 2 | F ST S/S | H ST N/S | 2 | 915 | 23 | 21,045.00 | E | NON | 79 |
| 9TH AVENUE | 3 | H ST N/S | I ST S/S | 2 | 250 | 24 | 6,000.00 | E | NON | 79 |
| 9TH STREET | 1 | FIR AVE N/S | DATE AVE N/S | 2 | 500 | 26 | 13,000.00 | E | CUR | 45 |
| 9TH STREET | 2 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | 2 | 320 | 23 | 7,360.00 | E | CUR | 73 |
| 9TH STREET | 3 | CENTRAL AVE S/S | ANDERSON AVE N/S | 2 | 325 | 35 | 11,375.00 | E | CUR | 6 |
| 9TH STREET | 4 | ANDERSON AVE S/S | END | 2 | 330 | 35 | 11,550.00 | E | CUR | 95 |
| 9TH STREET | 5 | DONNELLY AVE S/S | ELROD AVE N/S | 2 | 230 | 18 | 4,140.00 | E | CUR | 25 |
| 9TH STREET | 6 | ELROD AVE S/S | END | 2 | 615 | 25 | 15,375.00 | E | CUR | 25 |
| 9TH STREET | 7 | DATE AVE S/S | END | 2 | 875 | 27 | 23,625.00 | E | CUR | 63 |
| 9TH STREET | 04E | ANDERSON AVE S/S | END | 2 | 330 | 35 | 11,550.00 | E | CUR | 42 |
| A STREET | 1 | 1ST AVE E/S | 2ND AVE E/S | 2 | 275 | 22 | 6,050.00 | E | CUR | 25 |
| ACKERMAN STREET | 1 | NEWMARK AVE N/S | END | 2 | 1,265.00 | 33 | 41,745.00 | E | C\&G | 75 |
| ADLER AVENUE | 1 | 12TH ST W/S | 13TH ST W/S | 2 | 320 | 25 | 8,000.00 | E | CUR | 53 |
| ADLER AVENUE | 2 | 13TH ST W/S | END | 2 | 200 | 12 | 2,400.00 | E | NON | 94 |
| ALDERWOOD STREET | 1 | LINDBERG AVE N/S | WAITE ST N/S | 2 | 410 | 37 | 15,170.00 | E | C\&G | 85 |
| ANDERSON AVENUE | 1 | 10TH ST W/S | 11TH ST W/S | 2 | 310 | 33 | 10,230.00 | E | C\&G | 60 |
| ANDERSON AVENUE | 2 | 11T ST W/S | END | 2 | 1,550.00 | 23 | 35,650.00 | E | NON | 47 |
| ANDERSON AVENUE | 3 | 7TH ST W/S | 10TH ST E/S | 2 | 895 | 35 | 31,325.00 | E | CUR | 78 |
| APPLEWOOD DRIVE | 1 | 16TH AVE E/S | END | 2 | 870 | 16 | 13,920.00 | E | NON | 82 |
| ARAGO AVENUE | 1 | MORRISON ST E/S | END | 2 | 400 | 33 | 13,200.00 | E | C\&G | 56 |
| ARAGO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 71 |
| ARAGO AVENUE | 3 | MADISON ST W/S | FILLMORE ST E/S | 2 | 465 | 33 | 15,345.00 | E | CUR | 75 |
| AUGUSTINE AVENUE | 1 | END NORTH | LAKESHORE DR N/S | 2 | 1,600.00 | 34 | 54,400.00 | E | C\&G | 69 |
| AUGUSTINE AVENUE | 2 | LAKESHORE DR S/S | END SOUTH | 2 | 665 | 33 | 21,945.00 | E | C\&G | 73 |
| B STREET | 1 | 2ND AVE E/S | 4TH AVE E/S | 2 | 325 | 32 | 10,400.00 | E | NON | 94 |
| BARHAM TERRACE | 1 | PARK RD W/S | CDS | 2 | 210 | 26 | 6,460.00 | E | NON | 66 |
| BAYVIEW DRIVE | 1 | 16TH AVE E/S | END | 2 | 725 | 20 | 14,500.00 | E | NON | 57 |
| BENNETT AVENUE | 1 | 4TH ST W/S | 6TH ST W/S | 2 | 510 | 35 | 17,850.00 | E | CUR | 68 |
| BENNETT AVENUE | 2 | 6TH ST W/S | 7TH ST E/S | 2 | 230 | 25 | 5,750.00 | E | CUR | 56 |
| BESSIE STREET | 1 | FINK ST N/S | END | 2 | 245 | 27 | 6,615.00 | E | NON | 81 |
| BIRCH AVENUE | 1 | 14TH ST W/S | END | 2 | 110 | 25 | 2,750.00 | E | C\&G | 95 |
| BIRCH AVENUE | 2 | 8TH ST W/S | END | 2 | 160 | 22 | 3,520.00 | E | CUR | 78 |
| BIRCH AVENUE | 3 | 12TH ST W/S | 13TH ST E/S | 2 | 220 | 25 | 5,500.00 | E | CUR | 59 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCl |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BLANCO AVENUE |  | MORRISON ST E/S | FULTON AVE N/S | 2 | 640 | 33 | 21,120.00 |  | C\&G | 33 |
| BLANCO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 75 |
| BLANCO AVENUE | 3 | MADISON ST W/S | FILLMORE ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 82 |
| BROOKLYN DRIVE | 1 | END | END | 2 | 260 | 28 | 7,280.00 | E | C\&G | 95 |
| BROOKLYN LANE | 1 | WOODLAND DR W/S | BROOKLYN DR E/S | 2 | 265 | 24 | 6,360.00 | E | C\&G | 100 |
| BRULE STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | 2 | 415 | 33 | 13,695.00 | E | C\&G | 44 |
| BUTLER ROAD | 1 | OCEAN BL N/S | JUNIPER AVE S/S | 2 | 710 | 35 | 24,850.00 | E | CUR | 34 |
| CALIFORNIA AVENUE | 1 | SOUTHWEST BL W/S | 16TH ST W/S | 2 | 1,615.00 | 20 | 32,300.00 | E | NON | 83 |
| CALIFORNIA AVENUE | 2 | 16TH ST W/S | 19TH ST E/S | 2 | 860 | 22 | 18,920.00 | E | NON | 78 |
| CALIFORNIA AVENUE | 3 | 19TH ST E/S | 22ND ST W/S | 2 | 320 | 21 | 6,720.00 | E | C\&G | 93 |
| CAMMANN STREET | 1 | DIVISION AVE S/S | TAYLOR AVE N/S | 2 | 290 | 33 | 9,570.00 | E | C\&G | 88 |
| CAMMANN STREET | 2 | TAYLOR AVE N/S | GRANT AVE S/S | 2 | 545 | 36 | 19,620.00 | E | CUR | 25 |
| CAMMANN STREET | 3 | GRANT AVE S/S | HARRIS AVE N/S | 2 | 495 | 34 | 16,830.00 | E | CUR | 24 |
| CAMMANN STREET | 4 | HARRIS AVE N/S | JACKSON AVE N/S | 2 | 525 | 34 | 17,850.00 | E | CUR | 24 |
| CAMMANN STREET | 5 | JACKSON AVE N/S | SHETTER AVE N/S | 2 | 515 | 34 | 17,510.00 | E | CUR | 22 |
| CAMMANN STREET | 6 | SHETTER AVE N/S | NEWMARK AVE N/S | 2 | 495 | 53 | 26,235.00 | E | C\&G | 49 |
| CAMMANN STREET | 7 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 475 | 54 | 25,650.00 | E | C\&G | 85 |
| CAMMANN STREET | 8 | MICHIGAN AVE N/S | MONTGOMERY AVE N/S | 2 | 1,050.00 | 34 | 35,700.00 | E | C\&G | 81 |
| CAMMANN STREET | 9 | MONTGOMERY AVE N/S | PACIFIC AVE N/S | 2 | 515 | 33 | 16,995.00 | E | C\&G | 47 |
| CAMMANN STREET | 10 | PACIFIC AVE S/S | END | 2 | 1,500.00 | 33 | 49,500.00 | E | C\&G | 63 |
| CANYON DRIVE | 1 | 9TH AVE E/S | SHONSTA WY N/S | 2 | 370 | 21 | 7,770.00 | E | CUR | 41 |
| CANYON DRIVE | 2 | SHONSTA WY N/S | CANYON TERR S/S | 2 | 540 | 20 | 10,800.00 | E | CUR | 62 |
| CANYON TERRACE | 1 | CANYON DR W/S | END | 2 | 315 | 20 | 6,300.00 | E | CUR | 84 |
| CEDAR AVENUE | 1 | 10TH ST W/S | END | 2 | 335 | 23 | 7,705.00 | E | NON | 52 |
| CEDAR AVENUE | 2 | PARK AVE S/S | BIRCH AVE N/S | 2 | 590 | 18 | 10,620.00 | E | NON | 34 |
| CEDAR AVENUE | 3 | 16TH AVE W/S | END | 2 | 705 | 21 | 14,805.00 | E | NON | 70 |
| CENTRAL AVENUE | 1 | OCEAN BL E/S | 12TH ST E/S | 2 | 690 | 30 | 20,700.00 | A | CUR | 76 |
| CENTRAL AVENUE | 2 | 12TH ST E/S | 10TH ST W/S | 3 | 595 | 41 | 24,395.00 | A | CUR | 44 |
| CENTRAL AVENUE | 3 | 10TH ST W/S | 8TH ST W/S | 3 | 645 | 41 | 26,445.00 | A | CUR | 84 |
| CENTRAL AVENUE | 4 | 8TH ST W/S | 7TH ST W/S | 4 | 270 | 55 | 14,850.00 | A | CUR | 90 |
| CENTRAL AVENUE | 5 | E/S 7TH ST | 6 TH ST W/S | 2 | 220 | 36 | 7,920.00 | E | CUR | 95 |
| CENTRAL AVENUE | 6 | BROADWAY ST W/S | 4TH ST E/S | 1 | 725 | 34 | 24,650.00 | E | CUR | 100 |
| CHICKSES DRIVE |  | END NORTH | LAKESHORE DR N/S | 2 | 585 | 33 | 19,305.00 | E | C\&G | 79 |
| COMMERCIAL AVENUE |  | 1ST ST W/S | BROADWAY ST E/S | 2 | 185 | 42 | 7,770.00 | A | CUR | 68 |
| COMMERCIAL AVENUE | 2 | BROADWAY ST W/S | 7TH ST W/S | 2 | 1,565.00 | 42 | 65,730.00 | A | CUR | 77 |
| COMMERCIAL AVENUE | 3 | 7TH ST W/S | 8TH ST W/S | 2 | 300 | 33 | 9,900.00 | A | CUR | 70 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| COMMERCIAL AVENUE | 4 | 8TH ST W/S | 10TH ST E/S | 2 | 605 | 35 | 21,175.00 | A | CUR | 78 |
| COMMERCIAL AVENUE | 5 | 10TH ST W/S | 11TH ST E/S | 2 | 290 | 29 | 8,410.00 | A | CUR | 78 |
| COMMERCIAL AVENUE | 6 | 11TH ST W/S | 12TH ST E/S | 2 | 280 | 25 | 7,000.00 | A | CUR | 83 |
| COMMERCIAL AVENUE | 7 | 12TH ST W/S | 14TH ST E/S | 2 | 660 | 16 | 10,560.00 | A | CUR | 32 |
| COMPASS CIRCLE | 1 | RADAR RD E/S | CDS | 2 | 190 | 33 | 7,370.00 | E | C\&G | 72 |
| COTTONWOOD AVENUE | 1 | JUNIPER AVE N/S | END | 2 | 1,720.00 | 29 | 49,880.00 | E | CUR | 74 |
| CROCKER AVENUE | 1 | ST JOHN N/S | HOWARD ST N/S | 2 | 470 | 35 | 16,450.00 | E | C\&G | 74 |
| CROCKER AVENUE | 2 | HOWARD ST N/S | LAKESHORE DR N/S | 2 | 1,200.00 | 35 | 42,000.00 | E | C\&G | 62 |
| CROCKER AVENUE | 3 | LAKESHORE DR S/S | END | 2 | 690 | 35 | 24,150.00 | E | C\&G | 63 |
| CROCKER AVENUE | 4 | ST JOHN N/S | END | 2 | 800 | 35 | 28,000.00 | E | C\&G | 75 |
| CURTIS AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 1 | 115 | 33 | 3,795.00 | E | CUR | 56 |
| CURTIS AVENUE | 2 | BROADWAY ST W/S | 4TH ST E/S | 2 | 705 | 32 | 22,560.00 | E | C\&G | 47 |
| CYPRESS POINT | 1 | A ST N/S | END | 2 | 295 | 19 | 5,605.00 | E | NON | 67 |
| D STREET | 1 | HARBORVIEW DR W/S | COOS RIVER HWY E/S | 2 | 495 | 21 | 10,395.00 | C | NON | 63 |
| D STREET | 2 | 6TH AVE W/S | 5TH AVE W/S | 2 | 275 | 39 | 10,725.00 | C | NON | 61 |
| D STREET | 3 | 5TH AVE W/S | 2ND AVE W/S | 2 | 910 | 41 | 37,310.00 | C | NON | 34 |
| D STREET | 4 | 2ND AVE W/S | 1ST AVE E/S | 2 | 275 | 30 | 8,250.00 | C | NON | 81 |
| D STREET | 5 | 1ST AVE E/S | WHITTY ST W/S | 2 | 645 | 33 | 21,285.00 | C | C\&G | 76 |
| DAKOTA AVENUE | 1 | SOUTHWEST BL | END | 2 | 205 | 27 | 5,535.00 | E | C\&G | 21 |
| DATE AVENUE | 1 | 10TH ST E/S | 8TH ST E/S | 2 | 535 | 25 | 13,375.00 | E | CUR | 83 |
| DATE AVENUE | 2 | 8TH ST E/S | TELEGRAPH DR E/S | 2 | 1,205.00 | 34 | 40,970.00 | E | CUR | 79 |
| DATE AVENUE | 3 | TELEGRAPH DR E/S | 3RD CT E/S | 2 | 135 | 34 | 4,590.00 | E | CUR | 34 |
| DATE AVENUE | 4 | 10TH ST W/S | 10TH CT W/S | 2 | 250 | 18 | 4,500.00 | E | NON | 76 |
| DENISE PLACE | 1 | KENTUCKY AVE N/S | CDS | 2 | 410 | 34 | 14,840.00 | E | C\&G | 72 |
| DONNELLY AVENUE | 1 | 4TH ST W/S | 6TH ST E/S | 2 | 500 | 24 | 12,000.00 | E | C\&G | 84 |
| DONNELLY AVENUE | 2 | 6TH ST W/S | 7TH ST E/S | 2 | 230 | 26 | 5,980.00 | E | CUR | 14 |
| DONNELLY AVENUE | 3 | 7TH ST W/S | 9TH ST W/S | 2 | 510 | 25 | 12,750.00 | E | CUR | 14 |
| DUNN STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | 2 | 590 | 34 | 20,060.00 | E | C\&G | 62 |
| E STREET | 1 | 2ND AV W/S | 6TH ST W/S | 2 | 1,230.00 | 23 | 28,290.00 | E | NON | 30 |
| E STREET | 2 | 6TH AVE E/S | 9TH ST W/S | 2 | 875 | 21 | 18,375.00 | E | NON | 44 |
| E STREET | 3 | 9TH ST W/S | 11TH ST E/S | 2 | 565 | 23 | 12,995.00 | E | NON | 24 |
| E STREET | 4 | 11TH ST E/S | 14TH AVE W/S | 2 | 810 | 18 | 14,580.00 | E | NON | 26 |
| EDWARDS STREET | 1 | LAKESHORE DR E/S | END | 2 | 340 | 26 | 8,840.00 | E | C\&G | 95 |
| ELM AVENUE | 1 | 10TH CT E/S | END | 2 | 250 | 18 | 4,500.00 | E | NON | 80 |
| ELM STREET | 1 | 7TH RD E/S | END | 2 | 195 | 18 | 3,510.00 | E | NON | 68 |
| ELROD AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 2 | 90 | 38 | 3,420.00 | E | C\&G | 68 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCl |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ELROD AVENUE |  | BROADWAY ST W/S | 4TH ST E/S | 2 | 700 | 54 | 37,800.00 | C | CUR | 85 |
| ELROD AVENUE | 3 | 4TH ST W/S | 7TH ST E/S | 2 | 750 | 35 | 26,250.00 | C | CUR | 61 |
| ELROD AVENUE | 4 | 7TH ST W/S | 10TH ST W/S | 2 | 900 | 35 | 31,500.00 | C | CUR | 58 |
| ELROD AVENUE | 5 | 10TH ST W/S | 12TH ST W/S | 2 | 575 | 25 | 14,375.00 | E | CUR | 64 |
| EMPIRE BOULEVARD | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | 2 | 525 | 24 | 12,600.00 | A | NON | 77 |
| EMPIRE BOULEVARD | 2 | NEWMARK AVE N/S | CITY LIMITS | 2 | 4,445.00 | 32 | 142,240.00 | A | NON | 54 |
| EVERGREEN DRIVE | 1 | TIMBERLINE DR E/S | TIMBERLINE DR S/S | 2 | 655 | 34 | 22,270.00 | E | C\&G | 63 |
| EVERGREEN DRIVE | 2 | 17TH AVE W/S | 16TH AVE E/S | 2 | 200 | 24 | 4,800.00 | E | NON | 54 |
| F STREET | 1 | 6TH ST E/S | 9TH AVE W/S | 2 | 870 | 29 | 25,230.00 | E | C\&G | 79 |
| F STREET | 2 | 9TH AVE W/S | 10TH AVE W/S | 2 | 250 | 26 | 6,500.00 | E | C\&G | 53 |
| F STREET | 3 | 10TH AVE W/S | 12TH AVE E/S | 2 | 560 | 23 | 12,880.00 | E | C\&G | 79 |
| F STREET | 4 | 12TH AVE E/S | 12TH CT W/S | 2 | 125 | 25 | 3,125.00 | E | C\&G | 36 |
| F STREET | 5 | 12TH CT W/S | 14TH AVE W/S | 2 | 415 | 25 | 10,375.00 | E | C\&G | 85 |
| FENWICK AVENUE |  | MAXWELL RD S/S | ST JOHN ST S/S | 2 | 1,045.00 | 33 | 34,485.00 | E | C\&G | 81 |
| FENWICK AVENUE | 2 | ST JOHN ST S/S | LAKESHORE DR N/S | 2 | 1,625.00 | 35 | 56,875.00 | E | C\&G | 61 |
| FENWICK AVENUE | 3 | LAKESHORE DR S/S | END | 2 | 665 | 34 | 22,610.00 | E | C\&G | 83 |
| FERGUSON AVENUE | 1 | 7TH ST W/S | 9TH ST E/S | 2 | 490 | 25 | 12,250.00 | E | CUR | 25 |
| FERGUSON AVENUE | 2 | 9TH ST W/S | 10TH ST E/S | 2 | 235 | 25 | 5,875.00 | E | CUR | 14 |
| FERGUSON AVENUE | 3 | 10TH ST W/S | 11TH ST E/S | 2 | 230 | 26 | 5,980.00 | E | CUR | 23 |
| FERGUSON AVENUE | 4 | 11TH ST W/S | 12TH CT E/S | 2 | 225 | 25 | 5,625.00 | E | CUR | 37 |
| FERN COURT | 1 | EVERGREEN DR W/S | CDS | 2 | 240 | 34 | 9,160.00 | E | C\&G | 79 |
| FILBERT AVENUE | 1 | 17TH AVE E/S | 18TH AVE E/S | 2 | 115 | 32 | 3,680.00 | E | NON | 85 |
| FILBERT AVENUE | 2 | 18TH AVE E/S | END | 2 | 895 | 23 | 20,585.00 | E | NON | 74 |
| FILLMORE STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE S/S | 2 | 230 | 32 | 7,360.00 | E | C\&G | 94 |
| FILLMORE STREET | 2 | FULTON AVE S/S | END | 2 | 430 | 32 | 13,760.00 | E | C\&G | 82 |
| FINK STREET |  | WHITTY ST W/S | BESSIE ST E/S | 2 | 500 | 24 | 12,000.00 | E | NON | 63 |
| FINK STREET | 2 | WHITTY ST E/S | 1ST AVE W/S | 2 | 560 | 22 | 12,320.00 | E | NON | 55 |
| FIR AVENUE | 1 | 9TH ST E/S | 8TH ST W/S | 2 | 245 | 23 | 5,635.00 | E | CUR | 36 |
| FIR AVENUE | 2 | 7TH CT W/S | 4TH ST W/S | 2 | 640 | 21 | 13,440.00 | E | C\&G | 65 |
| FIR STREET |  | NEWMARK AVE S/S | WALNUT AVE S/S | 2 | 1,815.00 | 35 | 63,525.00 | E | C\&G | 72 |
| FLANAGAN AVENUE |  | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 34 | 15,810.00 | E | C\&G | 50 |
| FLANAGAN AVENUE | 2 | MORRISON ST E/S | END | 2 | 460 | 34 | 15,640.00 | E | C\&G | 44 |
| FOREST HILLS DRIVE |  | TIMBERLINE DR W/S | END | 2 | 1,830.00 | 25 | 45,750.00 | E | CUR | 95 |
| FRONT STREET | 1 | JOHNSON AVE N/S | INGERSOLL AVE N/S | 2 | 565 | 22 | 12,430.00 | E | C\&G | 79 |
| FULTON AVENUE |  | EMPIRE BL E/S | WASSON ST W/S | 2 | 810 | 32 | 25,920.00 | E | C\&G | 60 |
| FULTON AVENUE |  | CAMMANN ST W/S | END | 2 | 325 | 17 | 5,525.00 | E | C\&G | 79 |


| Name | $\begin{aligned} & \text { Section } \\ & \text { ID } \\ & \hline \end{aligned}$ | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| FULTON AVENUE | 4 | MADISON ST W/S | MORRISON ST W/S | 2 | 495 | 32 | 15,840.00 | E | C\&G | 80 |
| FULTON AVENUE | 5 | MORRISON ST E/S | 390' E/O MORRISON ST | 2 | 390 | 32 | 12,480.00 | E | C\&G | 81 |
| FULTON AVENUE | 6 | 390' E/O MORRISON ST | PREFONTAINE DR W/S | 2 | 755 | 33 | 24,915.00 | E | C\&G | 27 |
| FULTON AVENUE | 7 | PREFONTAINE DR W/S | RADAR RD E/S | 2 | 395 | 33 | 13,035.00 | E | C\&G | 23 |
| FULTON AVENUE | 8 | RADAR RD E/S | END | 2 | 225 | 34 | 7,650.00 | E | C\&G | 81 |
| FULTON AVENUE | 9 | FILLMORE ST E/S | END | 2 | 135 | 32 | 4,320.00 | E | C\&G | 82 |
| GARFIELD AVENUE | 1 | MORRISON ST E/S | END | 2 | 365 | 33 | 12,045.00 | E | C\&G | 76 |
| GARFIELD AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 71 |
| GARFIELD AVENUE |  | MADISON ST E/S | END | 2 | 490 | 34 | 16,660.00 | E | CUR | 60 |
| GOLDEN AVENUE | 1 | 7TH ST E/S | 5TH ST E/S | 2 | 400 | 36 | 14,400.00 | E | CUR | 63 |
| GOLDEN AVENUE | 2 | 5TH ST E/S | 4TH ST W/S | 2 | 350 | 42 | 14,700.00 | E | CUR | 56 |
| GOLDEN AVENUE |  | 4TH ST E/S | BROADWAY ST W/S | 2 | 700 | 50 | 35,000.00 | E | C\&G | 63 |
| GOLDEN AVENUE | 4 | BROADWAY ST E/S | FIRST ST W/S | 2 | 325 | 58 | 18,850.00 | E | C\&G | 77 |
| H STREET | 1 | 6TH AVE E/S | 9TH AVE W/S | 2 | 810 | 26 | 21,060.00 | E | NON | 46 |
| HALL AVENUE | 1 | 7TH ST E/S | 4TH ST W/S | 2 | 715 | 29 | 20,735.00 | E | CUR | 44 |
| HALL AVENUE | 2 | 4TH ST E/S | 2ND ST W/S | 2 | 325 | 31 | 10,075.00 | E | CUR | 46 |
| HALL AVENUE | 3 | 2ND ST E/S | ALLEY E/S | 2 | 165 | 35 | 5,775.00 | E | CUR | 60 |
| HALL AVENUE | 4 | ALLEY E/S | BROADWAY ST W/S | 2 | 160 | 30 | 4,800.00 | E | CUR | 77 |
| HALL AVENUE | 5 | BROADWAY ST E/S | 1ST ST W/S | 2 | 230 | 33 | 7,590.00 | E | C\&G | 85 |
| HARBORVIEW COURT |  | HARBORVIEW DR W/S | END | 2 | 180 | 16 | 2,880.00 | E | NON | 54 |
| HARBORVIEW DRIVE | 1 | D ST S/S | END | 2 | 475 | 16 | 7,600.00 | E | NON | 42 |
| HEMLOCK AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | 2 | 1,285.00 | 24 | 30,840.00 | E | CUR | 57 |
| HEMLOCK AVENUE | 2 | 10TH ST W/S | 13 TH ST E/S | 2 | 1,015.00 | 29 | 29,435.00 | E | CUR | 75 |
| HIGHLAND AVENUE |  | BROADWAY ST W/S | 2ND ST E/S | 2 | 205 | 24 | 4,920.00 | E | CUR | 80 |
| HIGHLAND AVENUE | 2 | 2ND ST W/S | 5TH ST E/S | 2 | 755 | 25 | 18,875.00 | E | CUR | 79 |
| HIGHLAND AVENUE | 3 | OCEAN BL E/S | 13TH ST E/S | 2 | 535 | 17 | 9,095.00 | E | NON | 73 |
| HOLLAND AVENUE |  | MILL ST W/S | END | 2 | 450 | 56 | 25,200.00 | E | NON | 81 |
| HOSPITAL WAY | 1 | WOODLAND AVE E/S | END | 2 | 865 | 35 | 30,275.00 | E | NON | 86 |
| HULL STREET | 1 | NEWMARK AVE N/S | CITY LIMITS | 2 | 75 | 34 | 2,550.00 | E | C\&G | 81 |
| I STREET | 1 | 14TH AVE E/S | 17TH AVE E/S | 2 | 720 | 22 | 15,840.00 | E | NON | 35 |
| I STREET | 2 | H ST N/S | IST S/S | 2 | 525 | 20 | 10,500.00 | E | NON | 71 |
| IDAHO AVENUE | 1 | SOUTHWEST BL W/S | END | 2 | 1,130.00 | 25 | 28,250.00 | E | C\&G | 50 |
| INGERSOLL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 2 | 230 | 38 | 8,740.00 | E | C\&G | 70 |
| INGERSOLL AVENUE | 2 | BROADWAY AVE W/S | 2ND ST E/S | 2 | 325 | 38 | 12,350.00 | E | AB | 29 |
| INGERSOLL AVENUE |  | 2ND ST W/S | 4TH ST E/S | 2 | 335 | 38 | 12,730.00 | E | CUR | 36 |
| INGERSOLL AVENUE |  | 4TH ST W/S | 5TH ST E/S | 2 | 345 | 28 | 9,660.00 | E | CUR | 28 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INGERSOLL AVENUE | 5 | 5TH ST W/S | 7TH ST E/S | 2 | 345 | 31 | 10,695.00 | E | CUR | 21 |
| INGERSOLL AVENUE | 6 | 7TH ST W/S | 10TH ST E/S | 2 | 725 | 25 | 18,125.00 | E | C\&G | 57 |
| INGERSOLL AVENUE | 7 | 10TH ST E/S | 11TH ST W/S | 2 | 405 | 35 | 14,175.00 | E | CUR | 74 |
| INGERSOLL AVENUE | 8 | 11TH ST W/S | END | 2 | 365 | 18 | 6,570.00 | E | NON | 57 |
| INGERSOLL AVENUE | 9 | FRON ST W/S | 1ST ST E/S | 2 | 220 | 33 | 7,260.00 | E | C\&G | 82 |
| INLET LOOP | 1 | NAUTICAL LN S/S (W) | NAUTICAL LN S/S (E) | 2 | 815 | 25 | 20,375.00 | E | C\&G | 95 |
| IVY AVENUE | 1 | BAYSHORE DR W/S | 7TH ST E/S | 2 | 585 | 37 | 21,645.00 | E | C\&G | 63 |
| JACKSON STREET | 1 | 1ST AVE W/S | MERCHANT ST W/S | 2 | 345 | 26 | 8,970.00 | E | NON | 35 |
| JACKSON STREET | 2 | MERCHANT ST W/S | END | 2 | 220 | 26 | 5,720.00 | E | CUR | 95 |
| JEFFERSON STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE N/S | 2 | 285 | 33 | 9,405.00 | E | C\&G | 91 |
| JOHN AVENUE | 1 | END WEST | LAKESHORE DR W/S | 2 | 275 | 15 | 4,125.00 | E | NON | 69 |
| JOHN AVENUE | 2 | LAKESHORE DR E/S | END EAST | 2 | 350 | 26 | 9,100.00 | E | C\&G | 81 |
| JOHNSON AVENUE | 1 | BROADWAY ST W/S | 4TH ST E/S | 2 | 720 | 39 | 28,080.00 | C | CUR | 36 |
| JOHNSON AVENUE | 2 | 4TH ST W/S | 5TH ST E/S | 2 | 345 | 39 | 13,455.00 | E | CUR | 73 |
| JOHNSON AVENUE | 3 | 5TH ST W/S | 7TH ST W/S | 2 | 385 | 39 | 15,015.00 | E | CUR | 67 |
| JOHNSON AVENUE | 4 | 7TH ST W/S | 10TH ST E/S | 2 | 725 | 25 | 18,125.00 | E | CUR | 81 |
| JOHNSON AVENUE | 5 | BROADWAY ST E/S | 1ST ST W/S | 3 | 205 | 56 | 11,480.00 | C | CUR | 80 |
| JOHNSON AVENUE | 6 | 1ST ST E/S | FRONT ST W/S | 5 | 220 | 55 | 12,100.00 | C | CUR | 78 |
| JUNIPER AVENUE | 1 | 20TH ST E/S | 19TH ST W/S | 2 | 330 | 34 | 11,220.00 | E | CUR | 53 |
| JUNIPER AVENUE | 2 | 19TH ST E/S | COTTONWOOD AVE E/S | 2 | 1,605.00 | 29 | 46,545.00 | E | CUR | 59 |
| JUNIPER AVENUE | 3 | COTTONWODD AVE E/S | BUTLER RD W/S | 2 | 235 | 30 | 7,050.00 | E | CUR | 73 |
| JUNIPER AVENUE | 4 | BUTLER RD W/S | 14TH ST W/S | 2 | 435 | 33 | 14,355.00 | E | CUR | 37 |
| JUNIPER AVENUE | 5 | 14TH ST W/S | 13TH ST E/S | 2 | 430 | 29 | 12,470.00 | E | CUR | 74 |
| JUNIPER AVENUE | 6 | 13TH ST E/S | END | 2 | 440 | 29 | 12,760.00 | E | CUR | 42 |
| JUNIPER AVENUE | 7 | MYRTLE AVE S/S | 20TH ST E/S | 2 | 505 | 33 | 16,665.00 | E | C\&G | 73 |
| KENTUCKY AVENUE | 1 | JEFFERSON ST W/S | END | 2 | 245 | 33 | 8,085.00 | E | C\&G | 94 |
| KENTUCKY AVENUE | 2 | JEFFERSON ST E/S | MORRISON ST W/S | 2 | 1,460.00 | 24 | 35,040.00 | E | C\&G | 80 |
| KENTUCKY AVENUE | 3 | MORRISON ST E/S | 125' W/O TRICIA PL | 2 | 395 | 24 | 9,480.00 | E | C\&G | 74 |
| KENTUCKY AVENUE | 4 | 125' W/O TRICIA PL | PREFONTAINE DR W/S | 2 | 705 | 33 | 23,265.00 | E | C\&G | 37 |
| KINGWOOD AVENUE | 1 | 7TH ST E/S | BAYSHORE DR W/S | 2 | 455 | 38 | 17,290.00 | E | CUR | 46 |
| KINGWOOD AVENUE | 2 | END | END | 2 | 1,070.00 | 23 | 24,610.00 | E | CUR | 84 |
| KINNEY ROAD | 1 | THOMPSON RD N/S | CITY LIMITS | 2 | 235 | 28 | 6,580.00 | E | NON | 30 |
| KNOT TERRACE | 1 | 28TH CT W/S | END | 2 | 535 | 23 | 12,305.00 | E | NON | 64 |
| KOOSBAY BOULEVARD | 1 | BAYSHORE DR W/S | 10TH ST E/S | 2 | 1,615.00 | 36 | 58,140.00 | C | C\&G | 71 |
| KOOSBAY BOULEVARD | 2 | 10TH ST E/S | TEAKWOOD AVE S/S | 2 | 2,170.00 | 30 | 65,100.00 | A | CUR | 70 |
| KOOSBAY BOULEVARD | 3 | TEAKWOOD AVE S/S | CITY LIMITS | 2 | 1,565.00 | 40 | 62,600.00 | A | C\&G | 45 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| KRUSE AVENUE | 1 | BROADWAY ST W/S | 4TH ST E/S | 2 | 1,040.00 | 40 | 41,600.00 | E | CUR | 67 |
| KRUSE AVENUE | 2 | 5TH ST W/S | 7TH ST E/S | 2 | 345 | 37 | 12,765.00 | E | C\&G | 16 |
| LA CLAIR STREET | 1 | OCEAN BL N/S | NEWMARK AVE S/S | 2 | 1,555.00 | 34 | 55,270.00 | E | C\&G | 26 |
| LAKE COURT | 1 | TIDEVIEW TERRACE S/S | CDS | 2 | 190 | 26 | 7,940.00 | E | C\&G | 85 |
| LAKESHORE DRIVE | 1 | TAYLOR AVE N/S | CHICKSES DR W/S | 2 | 1,440.00 | 28 | 40,320.00 | C | NON | 78 |
| LAKESHORE DRIVE | 2 | CHICKSES DR W/S | SEABREEZE TER E/S | 2 | 920 | 34 | 31,280.00 | C | C\&G | 79 |
| LAKESHORE DRIVE | 3 | SEABREEZE TER E/S | CROCKER AVE E/S | 2 | 1,355.00 | 34 | 46,070.00 | C | C\&G | 67 |
| LAKESHORE DRIVE | 4 | CROCKER AVE E/S | CITY LIMITS EAST | 2 | 1,600.00 | 25 | 40,000.00 | C | C\&G | 80 |
| LAUREL AVENUE | 1 | 14TH ST W/S | END | 2 | 245 | 26 | 6,370.00 | E | C\&G | 76 |
| LEAF TERRACE | 1 | 28TH CT W/S | END | 2 | 495 | 23 | 11,885.00 | E | NON | 69 |
| LIMNELL STREET | 1 | FINK ST S/S | END | 2 | 180 | 26 | 4,680.00 | E | NON | 72 |
| LINCOLN BOULEVARD | 1 | WEST HILLS BL S/S | OAKWAY DR E/S | 2 | 635 | 35 | 22,225.00 | E | C\&G | 37 |
| LINCOLN BOULEVARD | 2 | OAKWAY DR E/S | OCEAN BL W/S | 2 | 275 | 35 | 9,625.00 | E | CUR | 83 |
| LINDBERG AVENUE | 1 | FIR AVE W/S | END | 2 | 1,245.00 | 33 | 41,085.00 | E | C\&G | 84 |
| LINDBERG AVENUE | 2 | BRULE ST W/S | END | 2 | 525 | 35 | 18,375.00 | E | C\&G | 62 |
| LINDY LANE | 1 | OCEAN BL S/S | END | 2 | 75 | 26 | 1,950.00 | E | NON | 74 |
| LISA PLACE | 1 | KENTUCKY AVE S/S | CDS | 2 | 235 | 33 | 8,655.00 | E | C\&G | 76 |
| LOCKHART AVENUE | 1 | 7TH ST E/S | BROADWAY AVE E/S | 2 | 1,520.00 | 44 | 66,880.00 | C | CUR | 82 |
| MADISON STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE S/S | 2 | 235 | 30 | 7,050.00 | E | C\&G | 78 |
| MADISON STREET | 2 | PLYMOUTH AVE S/S | FULTON AVE S/S | 2 | 275 | 29 | 7,975.00 | E | C\&G | 95 |
| MADISON STREET | 3 | FULTON AVE N/S | PACIFIC AVE S/S | 2 | 1,005.00 | 35 | 35,175.00 | E | C\&G | 79 |
| MADISON STREET | 4 | PACIFIC AVE N/S | GARFIELD AVE S/S | 2 | 225 | 35 | 7,875.00 | E | CUR | 80 |
| MADISON STREET | 5 | GARFIELD AVE N/S | MICHIGAN AVE S/S | 2 | 1,265.00 | 35 | 44,275.00 | E | CUR | 76 |
| MAIN STREET | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | 2 | 325 | 55 | 17,875.00 | E | C\&G | 66 |
| MARKET AVENUE | 1 | 1ST ST W/S | BROADWAY E/S | 2 | 205 | 39 | 7,995.00 | E | C\&G | 74 |
| MARKET AVENUE | 2 | BROADWAY W/S | 4TH ST W/S | 2 | 785 | 39 | 30,615.00 | E | C\&G | 49 |
| MARKET AVENUE | 3 | 4TH ST W/S | 5TH ST E/S | 2 | 220 | 33 | 7,260.00 | E | C\&G | 61 |
| MARKET AVENUE | 4 | 5TH ST W/S | END | 2 | 180 | 25 | 4,500.00 | E | CUR | 25 |
| MARPLE STREET | 1 | FULTON ST N/S | PACIFIC AVE S/S | 2 | 1,005.00 | 33 | 33,165.00 | E | C\&G | 61 |
| MARPLE STREET | 2 | PACIFIC AVE N/S | MICHIGAN AVE S/S | 2 | 1,515.00 | 33 | 49,995.00 | E | C\&G | 61 |
| MARPLE STREET | 3 | MICHIGAN AVE N/S | NEWMARK AVE S/S | 2 | 465 | 54 | 25,110.00 | E | C\&G | 62 |
| MARPLE STREET | 4 | NEWMARK AVE N/S | SCHETTER AVE N/S | 2 | 515 | 52 | 26,780.00 | E | C\&G | 73 |
| MARPLE STREET | 5 | SCHETTER AVE N/S | JACKSON AVE N/S | 2 | 515 | 35 | 18,025.00 | E | CUR | 60 |
| MARPLE STREET | 6 | JACKSON AVE N/S | HARRIS AVE S/S | 2 | 495 | 32 | 15,840.00 | E | CUR | 58 |
| MARPLE STREET | 7 | HARRIS AVE S/S | GRANT AVE N/S | 2 | 560 | 32 | 17,920.00 | E | CUR | 62 |
| MARPLE STREET | 8 | GRANT AVE N/S | TAYLOR AVE N/S | 2 | 475 | 22 | 10,450.00 | E | CUR | 55 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MARSHALL AVENUE | 1 | MORRISON ST W/S | MADISON ST W/S | 2 | 500 | 20 | 10,000.00 | E | C\&G | 85 |
| MARSHALL AVENUE | 2 | MADISON W/S | END | 2 | 1,270.00 | 32 | 40,640.00 | E | C\&G | 91 |
| MARYLAND AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 34 | 15,810.00 | E | C\&G | 71 |
| MARYLAND AVENUE | 2 | MORRISON ST E/S | SCHONEMAN ST W/S | 2 | 375 | 34 | 12,750.00 | E | CUR | 59 |
| MASSEY LANE | 1 | HOSPITAL WY S/S | END | 2 | 395 | 40 | 15,800.00 | E | NON | 82 |
| MERCHANT STREET | 1 | 1ST AVE W/S | END | 2 | 475 | 26 | 12,350.00 | E | CUR | 95 |
| MERCHANT STREET | 2 | JACKSON ST S/S | D ST N/S | 2 | 230 | 22 | 5,060.00 | E | NON | 54 |
| MERCHANT STREET | 3 | D ST S/S | FINK ST N/S | 2 | 235 | 23 | 5,405.00 | E | NON | 57 |
| MERRILL STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | 2 | 685 | 33 | 22,605.00 | E | C\&G | 71 |
| MICHIGAN AVENUE | 1 | MILL ST E/S | EMPIRE BL W/S | 2 | 235 | 16 | 3,760.00 | E | NON | 39 |
| MICHIGAN AVENUE | 2 | EMPIRE BL E/S | MARPLE ST E/S | 2 | 290 | 53 | 15,370.00 | E | C\&G | 25 |
| MICHIGAN AVENUE | 3 | MARPLE ST E/S | CAMMANN ST W/S | 2 | 835 | 53 | 44,255.00 | E | C\&G | 48 |
| MICHIGAN AVENUE | 4 | CAMMANN ST E/S | MADISON ST E/S | 2 | 525 | 44 | 23,100.00 | E | C\&G | 64 |
| MICHIGAN AVENUE | 5 | MADISON ST E/S | MORRISON ST W/S | 2 | 460 | 37 | 17,020.00 | E | CUR | 24 |
| MICHIGAN AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST E/S | 2 | 405 | 35 | 14,175.00 | E | CUR | 77 |
| MICHIGAN AVENUE | 7 | SCHONEMAN ST E/S | END | 2 | 450 | 35 | 15,750.00 | E | CUR | 73 |
| MILL STREET | 1 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 515 | 28 | 14,420.00 | E | NON | 79 |
| MILLIGAN AVENUE | 1 | LA CLAIR ST W/S | END | 2 | 475 | 23 | 10,925.00 | E | C\&G | 85 |
| MINNESOTA AVENUE | 1 | SOUTHWEST BL N/S | 14TH ST W/S | 2 | 915 | 34 | 31,110.00 | E | C\&G | 31 |
| MINNESOTA AVENUE | 2 | 14TH ST W/S | END | 2 | 785 | 19 | 14,915.00 | E | C\&G | 81 |
| MONTGOMERY AVENUE | 1 | MARPLE ST W/S | CDS | 2 | 200 | 30 | 6,500.00 | E | C\&G | 75 |
| MONTGOMERY AVENUE | 2 | MARPLE ST E/S | WALL ST W/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 72 |
| MONTGOMERY AVENUE | 3 | WALL ST E/S | WASSON ST W/S | 2 | 265 | 33 | 8,745.00 | E | C\&G | 77 |
| MONTGOMERY AVENUE | 4 | WASSON ST E/S | CAMMANN ST W/S | 2 | 265 | 33 | 8,745.00 | E | C\&G | 57 |
| MONTGOMERY AVENUE | 5 | MORRISON ST W/S | END | 2 | 235 | 32 | 7,520.00 | E | C\&G | 63 |
| MONTGOMERY AVENUE | 6 | MORRISON ST E/S | END | 2 | 370 | 32 | 11,840.00 | E | C\&G | 7 |
| MORRISON STREET | 1 | LAKESHORE DR S/S | PIRATES CT S/S | 2 | 885 | 34 | 30,090.00 | C | C\&G | 57 |
| MORRISON STREET | 2 | PIRATES CT S/S | HARRIS AVE N/S | 2 | 1,190.00 | 26 | 30,940.00 | C | NON | 70 |
| MORRISON STREET | 3 | NEWMARK AVE N/S | END | 2 | 255 | 24 | 6,120.00 | E | C\&G | 84 |
| MORRISON STREET | 4 | NEWMARK AVE S/S | SALMON AVE N/S | 2 | 250 | 38 | 9,500.00 | C | C\&G | 40 |
| MORRISON STREET | 5 | SALMON AVE N/S | MICHIGAN AVE N/S | 2 | 295 | 37 | 10,915.00 | C | CUR | 53 |
| MORRISON STREET | 6 | MICHIGAN AVE N/S | MONTGOMERY AVE S/S | 2 | 1,085.00 | 34 | 36,890.00 | C | C\&G | 77 |
| MORRISON STREET | 7 | MONTGOMERY AVE S/S | PACIFIC AVE N/S | 2 | 485 | 33 | 16,005.00 | C | C\&G | 30 |
| MORRISON STREET | 8 | PACIFIC AVE N/S | WEBSTER AVE S/S | 2 | 555 | 33 | 18,315.00 | E | C\&G | 30 |
| MORRISON STREET | 9 | WEBSTER AVE S/S | BLANCO AVE S/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 54 |
| MORRISON STREET | 10 | BLANCO AVE S/S | MARSHALL AVE S/S | 2 | 1,035.00 | 33 | 34,155.00 | E | C\&G | 75 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MYRTLE AVENUE | 1 | BAYSHORE DR W/S | 6TH ST E/S | 2 | 185 | 36 | 6,660.00 | E | C\&G | 80 |
| MYRTLE AVENUE | 2 | 17TH ST W/S | 14TH ST W/S | 2 | 975 | 35 | 34,125.00 | E | CUR | 76 |
| MYRTLE AVENUE | 3 | 14TH ST E/S | END | 2 | 415 | 22 | 9,130.00 | E | NON | 65 |
| MYRTLE AVENUE | 4 | JUNIPER AVE E/S | WOODLAND AVE E/S | 2 | 490 | 32 | 15,680.00 | E | C\&G | 66 |
| NAUTICAL COURT | 1 | NAUTICAL LN N/S | CDS | 2 | 230 | 33 | 8,090.00 | E | C\&G | 95 |
| NAUTICAL LANE | 1 | PREFONTAINE DR W/S | END | 2 | 695 | 33 | 22,935.00 | E | C\&G | 95 |
| NEWMARK AVENUE | 1 | LA CLAIR ST E/S | WALLACE ST W/S | 3 | 1,765.00 | 48 | 92,720.00 | A | C\&G | 81 |
| NEWMARK AVENUE | 2 | WALLACE ST W/S | CAMMANN ST W/S | 5 | 2,610.00 | 64 | 167,040.00 | A | CUR | 83 |
| NEWMARK AVENUE | 3 | CAMMANN ST W/S | EMPIRE BL W/S | 3 | 1,160.00 | 55 | 63,800.00 | A | CUR | 82 |
| NEWMARK AVENUE | 4 | EMPIRE BL W/S | MILL ST W/S | 2 | 270 | 21 | 5,670.00 | E | NON | 49 |
| NEWMARK AVENUE | 5 | MILL ST W/S | END | 2 | 425 | 23 | 9,775.00 | E | NON | 71 |
| NICHOLLS AVENUE | 1 | EMPIRE BL E/S | MARPLE ST W/S | 2 | 245 | 24 | 5,880.00 | E | C\&G | 84 |
| NOBLE AVENUE | 1 | CAMMANN ST W/S | WASSON ST E/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 71 |
| NOBLE AVENUE | 2 | WASSON ST W/S | WALL ST E/S | 2 | 265 | 33 | 8,745.00 | E | C\&G | 77 |
| NOBLE AVENUE | 3 | WALL ST W/S | MARPLE ST E/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 75 |
| NOBLE AVENUE | 4 | MARPLE ST W/S | EMPIRE BL E/S | 2 | 250 | 33 | 8,250.00 | E | C\&G | 77 |
| NOBLE AVENUE | 5 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 34 | 15,810.00 | E | C\&G | 76 |
| NOBLE AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST W/S | 2 | 375 | 34 | 12,750.00 | E | C\&G | 69 |
| NORMAN AVENUE | 1 | NEWMARK AVE N/S | END | 2 | 270 | 33 | 8,910.00 | E | C\&G | 83 |
| NORMAN AVENUE | 2 | NEWMARK AVE S/S | OCEAN BL N/S | 2 | 1,165.00 | 33 | 38,445.00 | E | C\&G | 51 |
| NUTWOOD AVENUE | 1 | 14TH ST W/S | 15TH ST E/S | 2 | 220 | 20 | 4,400.00 | E | NON | 39 |
| OAKWAY COURT | 1 | OAKWAY DR W/S | END | 2 | 85 | 33 | 2,805.00 | E | C\&G | 73 |
| OAKWAY DRIVE | 1 | WEST HILLS BL S/S | LINCOLN RD N/S | 2 | 460 | 34 | 15,640.00 | E | C\&G | 73 |
| OAKWAY DRIVE | 2 | LINCOLN RD S/S (E) | LINCOLN RD N/S (W) | 2 | 1,305.00 | 34 | 44,370.00 | E | CUR | 61 |
| OCEAN BOULEVARD | 1 | CENTRAL AVE N/S | LINCOLN RD N/S | 3 | 2,660.00 | 57 | 151,620.00 | A | CUR | 77 |
| OCEAN BOULEVARD | 2 | LINCOLN RD N/S | WOODLAND RD W/S | 3 | 2,435.00 | 67 | 163,145.00 | A | CUR | 79 |
| OCEAN BOULEVARD | 3 | WOODLAND RD W/S | 28TH CT W/S | 5 | 3,410.00 | 41 | 139,810.00 | A | CUR | 82 |
| OCEAN BOULEVARD | 4 | 28TH ST W/S | VINE AVE N/S | 4 | 2,625.00 | 51 | 133,875.00 | A | CUR | 84 |
| OCEAN BOULEVARD | 5 | VINE AVE N/S | NORMAN AVE W/S | 4 | 2,260.00 | 51 | 115,260.00 | A | CUR | 84 |
| OCEAN BOULEVARD | 6 | NORMAN AVE W/S | NEWMARK AVE S/S | 4 | 1,825.00 | 51 | 93,075.00 | A | CUR | 80 |
| OCEAN TERRACE | 1 | LINCOLN RD N/S | WEST HILLS BL E/S | 2 | 570 | 16 | 9,120.00 | E | CUR | 76 |
| OREGON AVENUE | 1 | SOUTHWEST BL W/S | END | 2 | 1,315.00 | 26 | 34,190.00 | E | C\&G | 61 |
| PACIFIC AVENUE | 1 | EMPIRE BL E/S | FILLMORE ST W/S | 2 | 1,845.00 | 34 | 62,730.00 | C | C\&G | 82 |
| PACIFIC AVENUE | 2 | FILLMORE AVE W/S | MORRISON ST W/S | 2 | 995 | 34 | 33,830.00 | C | CUR | 73 |
| PACIFIC AVENUE | 3 | MORRISON ST E/S | END | 2 | 1,510.00 | 33 | 49,830.00 | E | CUR | 35 |
| PARK AVENUE | 1 | TELEGRAPH DR S/S | 4TH CT W/S | 2 | 485 | 35 | 16,975.00 | E | CUR | 20 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PARK AVENUE | 2 | 4TH CT W/S | 4TH ST W/S | 2 | 230 | 25 | 5,750.00 | E | CUR | 69 |
| PARK AVENUE | 3 | 4TH ST W/S | BROADWAY ST W/S | 2 | 675 | 34 | 22,950.00 | E | CUR | 72 |
| PARK AVENUE | 4 | 14TH ST E/S | CEDAR AVE S/S | 2 | 1,555.00 | 20 | 31,100.00 | E | NON | 48 |
| PARK AVENUE | 5 | 11TH ST W/S | END | 2 | 550 | 23 | 12,650.00 | E | CUR | 27 |
| PENNSYLVANIA AVENUE | 1 | SOUTHWEST BL W/S | 17TH ST W/S | 2 | 900 | 36 | 32,400.00 | E | C\&G | 10 |
| PENNSYLVANIA AVENUE | 2 | 17TH ST W/S | 19TH ST W/S | 2 | 640 | 26 | 16,640.00 | E | NON | 53 |
| PENNSYLVANIA COURT | 1 | PENNSYLVANIA PL W/S | END | 2 | 185 | 33 | 6,105.00 | E | C\&G | 95 |
| PENNSYLVANIA PLACE | 1 | PENNSYLVANIA AVE N/S | END | 2 | 550 | 33 | 18,150.00 | E | C\&G | 95 |
| PINE AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | 2 | 515 | 36 | 18,540.00 | E | CUR | 70 |
| PLYMOUTH AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 32 | 14,880.00 | E | C\&G | 86 |
| PLYMOUTH AVENUE | 2 | MORRISON ST E/S | END | 2 | 360 | 24 | 8,640.00 | E | C\&G | 82 |
| PREFONTAINE DRIVE | 1 | NAUTICAL LN N/S | FULTON AVE S/S | 2 | 1,115.00 | 33 | 36,795.00 | E | C\&G | 25 |
| RADAR ROAD | 1 | FULTON AVE N/S | OCEAN BL S/S | 2 | 2,195.00 | 35 | 76,825.00 | E | C\&G | 24 |
| REDWOOD AVENUE | 1 | 8TH ST W/S | 11TH ST E/S | 2 | 520 | 22 | 11,440.00 | E | CUR | 48 |
| SALMON AVENUE | 1 | MORRISON ST E/S | SCHONEMAN ST W/S | 2 | 365 | 34 | 12,410.00 | E | C\&G | 73 |
| SALMON AVENUE | 2 | SCHONEMAN ST E/S | END | 2 | 460 | 32 | 14,720.00 | E | C\&G | 77 |
| SANFORD AVENUE | 1 | END NORTH | VIRGINIA AVE N/S | 2 | 185 | 35 | 6,475.00 | E | C\&G | 80 |
| SANFORD AVENUE | 2 | VIRGINIA AVE S/S | LAKESHORE DR N/S | 2 | 2,240.00 | 34 | 76,160.00 | E | C\&G | 65 |
| SANFORD AVENUE | 3 | LAKESHORE DR S/S | CDS | 2 | 540 | 30 | 19,700.00 | E | ROL | 84 |
| SCHETTER AVENUE | 1 | MARPLE ST E/S | WALL ST W/S | 2 | 265 | 50 | 13,250.00 | E | C\&G | 80 |
| SCHETTER AVENUE | 2 | WALL ST E/S | WASSON ST W/S | 2 | 260 | 54 | 14,040.00 | E | C\&G | 77 |
| SCHONEMAN STREET | 1 | HARRIS AVE S/S | NEWMARK AVE N/S | 2 | 1,135.00 | 35 | 39,725.00 | C | C\&G | 33 |
| SCHONEMAN STREET | 2 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 550 | 33 | 18,150.00 | E | C\&G | 66 |
| SCHONEMAN STREET | 3 | MICHIGAN AVE S/S | FLANAGAN AVE N/S | 2 | 755 | 33 | 24,915.00 | E | C\&G | 59 |
| SEABREEZE TERRACE | 1 | TIDEVIEW TERRACE S/S | LAKESHORE DR N/S | 2 | 305 | 26 | 7,930.00 | E | C\&G | 48 |
| SEABREEZE TERRACE | 2 | LAKESHORE DR S/S | LAKEWOOD LN N/S | 2 | 490 | 26 | 12,740.00 | E | C\&G | 67 |
| SEAGATE STREET | 1 | END NORTH | LAKESHORE DR N/S | 2 | 1,195.00 | 36 | 43,020.00 | E | C\&G | 85 |
| SEAGATE STREET | 3 | LAKESHORE DR S/S | END SOUTH | 2 | 715 | 33 | 23,595.00 | E | C\&G | 66 |
| SHON-STA WAY | 1 | CANYON DR E/S | END | 2 | 245 | 25 | 6,125.00 | E | NON | 65 |
| SIGNAL WAY | 1 | DATE AVE S/S | TELEGRAPH DR E/S | 2 | 720 | 35 | 25,200.00 | E | CUR | 51 |
| SOUTHWEST BOULEVARD | 1 | CITY LIMITS SOUTH | PENNSYLVANIA AVE S/S | 2 | 1,540.00 | 33 | 50,820.00 | A | C\&G | 86 |
| SOUTHWEST BOULEVARD | 2 | PENNSYLVANIA AVE S/S | MONTANA AVE S/S | 2 | 1,270.00 | 36 | 45,720.00 | A | C\&G | 77 |
| SOUTHWEST BOULEVARD | 3 | MONTANA AVE S/S | WASHINGTON AVE S/S | 2 | 1,435.00 | 40 | 57,400.00 | A | C\&G | 47 |
| SOUTHWEST BOULEVARD | 4 | WASHINGTON AVE S/S | 7TH ST E/S | 2 | 2,245.00 | 37 | 83,065.00 | A | CUR | 74 |
| SPRUCE AVENUE | 1 | 11TH ST W/S | END | 2 | 140 | 20 | 2,800.00 | E | CUR | 75 |
| SPRUCE AVENUE | 2 | 14TH ST W/S | 16TH ST E/S | 2 | 570 | 18 | 10,260.00 | E | NON | 78 |


| Name | Section ID | From | To | Lanes | Length | Width | True Area |  | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STILLWATER DRIVE |  | LAKESHORE DR N/S | CITY LIMITS NORTH | 2 | 790 | 30 | 23,700.00 | E | ROL | 85 |
| TAYLOR AVENUE | 1 | MARPLE ST W/S | WALL ST W/S | 2 | 220 | 34 | 7,480.00 | E | CUR | 73 |
| TAYLOR AVENUE | 2 | WALL ST W/S | WASSON ST W/S | 2 | 300 | 32 | 9,600.00 | E | CUR | 79 |
| TAYLOR AVENUE |  | WASSON ST E/S | CAMMANN ST W/S | 2 | 260 | 33 | 8,580.00 | E | CUR | 73 |
| TEAKWOOD AVENUE | 1 | 200' W/O 14TH ST | 14TH ST E/S | 2 | 230 | 32 | 7,360.00 | E | CUR | 84 |
| TEAKWOOD AVENUE | 2 | 14TH ST E/S | KOOSBAY BL W/S | 2 | 520 | 30 | 15,600.00 | E | CUR | 82 |
| TELEGRAPH DRIVE | 1 | DATE AVE (E) S/S | PARK AVE E/S | 2 | 1,080.00 | 35 | 37,800.00 | E | CUR | 38 |
| TELEGRAPH DRIVE | 2 | PARK AVE E/S | DATE AVE (W) S/S | 2 | 1,025.00 | 35 | 35,875.00 | E | CUR | 45 |
| THOMAS STREET |  | LA CLAIR ST E/S | END | 2 | 605 | 35 | 21,175.00 | E | C\&G | 69 |
| THOMPSON ROAD | 1 | KOOSBAY BL W/S | 15TH CT W/S | 2 | 1,340.00 | 35 | 46,900.00 | C | C\&G | 80 |
| THOMPSON ROAD | 2 | 15TH CT W/S | KINNEY RD E/S | 2 | 1,895.00 | 37 | 70,115.00 | C | C\&G | 76 |
| THOMPSON ROAD |  | KINNEY RD E/S | WOODLAND DR E/S | 2 | 575 | 36 | 20,700.00 | C | C\&G | 78 |
| TIDEVIEW TERRACE | 1 | CHICKSES DR E/S | SEABREEZE TERRACE E/S | 2 | 625 | 25 | 15,625.00 | E | C\&G | 81 |
| TIMBERLINE DRIVE | 1 | 19TH ST W/S | 235' S/O EVERGREEN DR | 2 | 1,805.00 | 34 | 61,370.00 | E | C\&G | 95 |
| TIMBERLINE DRIVE | 2 | 235' S/O EVERGREEN DR | FOREST HILLS DR N/S | 2 | 705 | 28 | 19,740.00 | E | CUR | 95 |
| TRICIA PLACE | 1 | KENTUCKY AVE N/S | CDS | 2 | 235 | 33 | 8,655.00 | E | C\&G | 52 |
| TWIG TERRACE |  | 28TH CT W/S | CDS | 2 | 475 | 23 | 11,425.00 | E | NON | 66 |
| UNDERWOOD AVENUE | 1 | 8TH ST W/S | END | 2 | 405 | 13 | 5,265.00 | E | NON | 55 |
| VINE AVENUE | 1 | 34TH ST W/S | OCEAN BL E/S | 2 | 425 | 33 | 14,025.00 | E | C\&G | 80 |
| VIRGINIA AVENUE |  | FENWICK AVE E/S | CROCKER AVE W/S | 2 | 505 | 34 | 17,170.00 | E | C\&G | 79 |
| VIRGINIA AVENUE | 2 | CROCKER AVE E/S | CITY LIMITS EAST | 2 | 110 | 32 | 3,520.00 | E | C\&G | 83 |
| WAITE STREET |  | ALDERWOOD ST E/S | END | 2 | 160 | 37 | 5,920.00 | E | C\&G | 86 |
| WALL STREET |  | TAYLOR AVE S/S | HARRIS AVE S/S | 2 | 1,025.00 | 36 | 36,900.00 | E | CUR | 74 |
| WALL STREET | 2 | HARRIS AVE S/S | SCHETTER AVE N/S | 2 | 1,010.00 | 34 | 34,340.00 | E | CUR | 59 |
| WALL STREET | 3 | SCHETTER AVE N/S | NEWMARK AVE N/S | 2 | 520 | 53 | 27,560.00 | E | C\&G | 84 |
| WALL STREET | 4 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 465 | 53 | 24,645.00 | E | C\&G | 58 |
| WALL STREET | 5 | MICHIGAN AVE S/S | PACIFIC AVE N/S | 2 | 1,515.00 | 33 | 49,995.00 | E | C\&G | 68 |
| WALL STREET | 6 | PACIFIC AVE S/S | FULTON AVE N/S | 2 | 1,005.00 | 33 | 33,165.00 | E | C\&G | 74 |
| WALLACE STREET |  | NEWMARK AVE S/S | OCEAN BL N/S | 2 | 615 | 37 | 22,755.00 | E | C\&G | 62 |
| WALLACE STREET | 2 | OCEAN BL S/S | END | 2 | 485 | 33 | 16,005.00 | E | C\&G | 45 |
| WALNUT AVENUE |  | FIR ST W/S | $34 T H$ ST E/S | 2 | 745 | 33 | 24,585.00 | E | C\&G | 83 |
| WASHINGTON AVENUE | 1 | SOUTHWEST BL W/S | END | 2 | 1,220.00 | 25 | 30,500.00 | E | C\&G | 46 |
| WASSON STREET |  | HARRIS AVE S/S | TAYLOR AVE N/S | 2 | 1,060.00 | 34 | 36,040.00 | C | C\&G | 54 |
| WASSON STREET |  | HARRIS AVE N/S | SCHETTER AVE S/S | 2 | 1,060.00 | 34 | 36,040.00 | C | C\&G | 71 |
| WASSON STREET |  | SCHETTER AVE S/S | NEWMARK AVE N/S | 2 | 475 | 34 | 16,150.00 | C | C\&G | 72 |
| WASSON STREET | 4 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 465 | 52 | 24,180.00 | E | C\&G | 32 |

City of Coos Bay
PCI Report 2015
Alphabetical

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WASSON STREET | 5 | MICHIGAN AVE S/S | NOBLE AVE N/S | 2 | 475 | 34 | 16,150.00 | E | C\&G | 33 |
| WASSON STREET | 6 | NOBLE AVE N/S | PACIFIC AVE N/S | 2 | 1,040.00 | 34 | 35,360.00 | E | C\&G | 45 |
| WASSON STREET | 7 | PACIFIC AVE S/S | END | 2 | 1,500.00 | 33 | 49,500.00 | E | C\&G | 45 |
| WEBSTER AVENUE | 1 | MADISON ST W/S | END | 2 | 445 | 33 | 14,685.00 | E | C\&G | 76 |
| WEBSTER AVENUE | 2 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 72 |
| WEBSTER AVENUE | 3 | MORRISON ST E/S | END | 2 | 380 | 33 | 12,540.00 | E | C\&G | 72 |
| WEST HILLS BOULEVARD | 1 | OCEAN BL S/S | LINCOLN BL W/S | 2 | 485 | 33 | 16,005.00 | E | C\&G | 50 |
| WHITTY STREET | 1 | D ST S/S | END | 2 | 475 | 31 | 14,725.00 | E | CUR | 17 |
| WISCONSIN AVENUE | 1 | EMPIRE BL E/S | END | 2 | 375 | 33 | 12,375.00 | E | C\&G | 75 |
| WOODLAND DRIVE | 1 | CITY LIMITS | MYRTLE AVE S/S | 3 | 2,700.00 | 37 | 99,900.00 | A | C\&G | 84 |
| WOODLAND DRIVE | 2 | MYRTLE AVE S/S | OCEAN BL N/S | 2 | 980 | 37 | 36,260.00 | A | CUR | 82 |
| YEW AVENUE | 1 | KOOSBAY BL E/S | END | 2 | 210 | 32 | 6,720.00 | E | NON | 15 |
| YEW AVENUE | 2 | KOOSBAY BL E/S | END | 2 | 690 | 25 | 17,250.00 | E | NON | 23 |
| YEW AVENUE | 3 | 15TH ST E/S | END | 2 | 150 | 20 | 3,000.00 | E | NON | 85 |
| YEW STREET | 1 | 35TH ST W/S | END | 2 | 240 | 33 | 7,920.00 | E | C\&G | 73 |
| ZANNA PLACE | 1 | KENTUCKY AVE S/S | CDS | 2 | 235 | 33 | 8,655.00 | E | C\&G | 67 |

$$
353,940 \quad 11,557,160
$$

## Total Length

 Total Area
## Total Centerline Miles

Average PCI

## 11,557,150 SF

67.0 Miles
64.3 PCI

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 11TH STREET | 6 | 100' N/O CENTRAL AVE | 100' N/O COMMERCIAL AVE | 2 | 350 | 25 | 8,750.00 | E | C\&G | 100 |
| BROOKLYN LANE | 1 | WOODLAND DR W/S | BROOKLYN DR E/S | 2 | 265 | 24 | 6,360.00 | E | C\&G | 100 |
| CENTRAL AVENUE | 6 | BROADWAY ST W/S | 4TH ST E/S | 1 | 725 | 34 | 24,650.00 | E | CUR | 100 |
| 10TH COURT |  | F ST S/S | END | 2 | 125 | 12 | 1,500.00 | E | NON | 95 |
| 11TH AVENUE | 1 | F ST S/S | END | 2 | 200 | 23 | 4,600.00 | E | NON | 95 |
| 11TH COURT | 1 | F ST S/S | END | 2 | 135 | 17 | 2,295.00 | E | NON | 95 |
| 12TH AVENUE | 1 | F ST S/S | END | 2 | 205 | 23 | 4,715.00 | E | NON | 95 |
| 12TH STREET | 5 | CENTRAL AVE N/S | COMMERCIAL AVE N/S | 2 | 355 | 45 | 12,975.00 | E | CUR | 95 |
| 13TH AVENUE | 2 | F ST S/S | END | 2 | 245 | 22 | 5,390.00 | E | C\&G | 95 |
| 13TH COURT | 1 | F ST S/S | END | 2 | 80 | 15 | 1,200.00 | E | NON | 95 |
| 14TH STREET | 7 | COMMERCIAL AVE S/S | HIGHLAND AVE S/S | 2 | 360 | 42 | 11,120.00 | E | NON | 95 |
| 22ND STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 360 | 21 | 7,560.00 | E | C\&G | 95 |
| 5TH STREET | 2 | MARKET AVE N/S | COMMERCIAL AVE N/S | 2 | 255 | 34 | 8,670.00 | E | C\&G | 95 |
| 8TH STREET | 14 | ANDERSON AVE S/S | END | 2 | 550 | 36 | 19,800.00 | E | CUR | 95 |
| 9TH STREET | 4 | ANDERSON AVE S/S | END | 2 | 330 | 35 | 11,550.00 | E | CUR | 95 |
| BIRCH AVENUE | 1 | 14TH ST W/S | END | 2 | 110 | 25 | 2,750.00 | E | C\&G | 95 |
| BROOKLYN DRIVE | 1 | END | END | 2 | 260 | 28 | 7,280.00 | E | C\&G | 95 |
| CENTRAL AVENUE | 5 | E/S 7TH ST | 6TH ST W/S | 2 | 220 | 36 | 7,920.00 | E | CUR | 95 |
| EDWARDS STREET | 1 | LAKESHORE DR E/S | END | 2 | 340 | 26 | 8,840.00 | E | C\&G | 95 |
| FOREST HILLS DRIVE | 1 | TIMBERLINE DR W/S | END | 2 | 1,830.00 | 25 | 45,750.00 | E | CUR | 95 |
| INLET LOOP | 1 | NAUTICAL LN S/S (W) | NAUTICAL LN S/S (E) | 2 | 815 | 25 | 20,375.00 | E | C\&G | 95 |
| JACKSON STREET | 2 | MERCHANT ST W/S | END | 2 | 220 | 26 | 5,720.00 | E | CUR | 95 |
| MADISON STREET | 2 | PLYMOUTH AVE S/S | FULTON AVE S/S | 2 | 275 | 29 | 7,975.00 | E | C\&G | 95 |
| MERCHANT STREET | 1 | 1ST AVE W/S | END | 2 | 475 | 26 | 12,350.00 | E | CUR | 95 |
| NAUTICAL COURT | 1 | NAUTICAL LN N/S | CDS | 2 | 230 | 33 | 8,090.00 | E | C\&G | 95 |
| NAUTICAL LANE | 1 | PREFONTAINE DR W/S | END | 2 | 695 | 33 | 22,935.00 | E | C\&G | 95 |
| PENNSYLVANIA COURT | 1 | PENNSYLVANIA PL W/S | END | 2 | 185 | 33 | 6,105.00 | E | C\&G | 95 |
| PENNSYLVANIA PLACE | 1 | PENNSYLVANIA AVE N/S | END | 2 | 550 | 33 | 18,150.00 | E | C\&G | 95 |
| TIMBERLINE DRIVE | 1 | 19TH ST W/S | 235' S/O EVERGREEN DR | 2 | 1,805.00 | 34 | 61,370.00 | E | C\&G | 95 |
| TIMBERLINE DRIVE | 2 | 235' S/O EVERGREEN DR | FOREST HILLS DR N/S | 2 | 705 | 28 | 19,740.00 | E | CUR | 95 |
| ADLER AVENUE | 2 | 13TH ST W/S | END | 2 | 200 | 12 | 2,400.00 | E | NON | 94 |
| B STREET | 1 | 2ND AVE E/S | 4TH AVE E/S | 2 | 325 | 32 | 10,400.00 | E | NON | 94 |
| FILLMORE STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE S/S | 2 | 230 | 32 | 7,360.00 | E | C\&G | 94 |
| KENTUCKY AVENUE | 1 | JEFFERSON ST W/S | END | 2 | 245 | 33 | 8,085.00 | E | C\&G | 94 |
| 10TH AVENUE | 3 | F ST S/S | END | 2 | 385 | 24 | 9,240.00 | E | NON | 93 |
| 14TH AVENUE | 1 | F ST N/S | D ST S/S | 2 | 900 | 25 | 22,500.00 | E | NON | 93 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 16TH AVENUE | 1 | EVERGREEN ST S/S | COOS RIVER HWY S/S | 2 | 1,365.00 | 28 | 38,220.00 | E | NON | 93 |
| CALIFORNIA AVENUE | 3 | 19TH ST E/S | 22ND ST W/S | 2 | 320 | 21 | 6,720.00 | E | C\&G | 93 |
| JEFFERSON STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE N/S | 2 | 285 | 33 | 9,405.00 | E | C\&G | 91 |
| MARSHALL AVENUE | 2 | MADISON W/S | END | 2 | 1,270.00 | 32 | 40,640.00 | E | C\&G | 91 |
| CENTRAL AVENUE | 4 | 8TH ST W/S | 7TH ST W/S | 4 | 270 | 55 | 14,850.00 | A | CUR | 90 |
| CAMMANN STREET | 1 | DIVISION AVE S/S | TAYLOR AVE N/S | 2 | 290 | 33 | 9,570.00 | E | C\&G | 88 |
| 14TH STREET | 6 | F ST N/S | I ST S/S | 2 | 1,220.00 | 23 | 28,060.00 | E | NON | 86 |
| 33RD STREET | 1 | N/S WALNUT AVE | LINDBERG AVE S/S | 2 | 400 | 33 | 13,200.00 | E | C\&G | 86 |
| HOSPITAL WAY | 1 | WOODLAND AVE E/S | END | 2 | 865 | 35 | 30,275.00 | E | NON | 86 |
| PLYMOUTH AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 32 | 14,880.00 | E | C\&G | 86 |
| SOUTHWEST BOULEVARD | 1 | CITY LIMITS SOUTH | PENNSYLVANIA AVE S/S | 2 | 1,540.00 | 33 | 50,820.00 | A | C\&G | 86 |
| WAITE STREET | 1 | ALDERWOOD ST E/S | END | 2 | 160 | 37 | 5,920.00 | E | C\&G | 86 |
| 13TH AVENUE | 3 | F ST N/S | END | 2 | 325 | 28 | 9,100.00 | E | NON | 85 |
| 14TH STREET | 5 | CEDAR AVE S/S | BIRCH AVE N/S | 2 | 250 | 29 | 7,250.00 | E | C\&G | 85 |
| 2ND AVENUE | 03B | B ST S/S | A ST S/S | 2 | 470 | 16 | 7,520.00 | E | NON | 85 |
| 4TH STREET | 5 | CURTIS AVE S/S | ANDERSON AVE S/S | 2 | 495 | 63 | 31,185.00 | C | CUR | 85 |
| 6TH STREET | 8 | MYRTLE AVE S/S | PINE AVE S/S | 2 | 745 | 41 | 30,545.00 | E | C\&G | 85 |
| ALDERWOOD STREET | 1 | LINDBERG AVE N/S | WAITE ST N/S | 2 | 410 | 37 | 15,170.00 | E | C\&G | 85 |
| CAMMANN STREET | 7 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 475 | 54 | 25,650.00 | E | C\&G | 85 |
| ELROD AVENUE | 2 | BROADWAY ST W/S | 4TH ST E/S | 2 | 700 | 54 | 37,800.00 | C | CUR | 85 |
| F STREET | 5 | 12TH CT W/S | 14TH AVE W/S | 2 | 415 | 25 | 10,375.00 | E | C\&G | 85 |
| FILBERT AVENUE | 1 | 17TH AVE E/S | 18TH AVE E/S | 2 | 115 | 32 | 3,680.00 | E | NON | 85 |
| HALL AVENUE | 5 | BROADWAY ST E/S | 1ST ST W/S | 2 | 230 | 33 | 7,590.00 | E | C\&G | 85 |
| LAKE COURT | 1 | TIDEVIEW TERRACE S/S | CDS | 2 | 190 | 26 | 7,940.00 | E | C\&G | 85 |
| MARSHALL AVENUE | 1 | MORRISON ST W/S | MADISON ST W/S | 2 | 500 | 20 | 10,000.00 | E | C\&G | 85 |
| MILLIGAN AVENUE | 1 | LA CLAIR ST W/S | END | 2 | 475 | 23 | 10,925.00 | E | C\&G | 85 |
| SEAGATE STREET | 1 | END NORTH | LAKESHORE DR N/S | 2 | 1,195.00 | 36 | 43,020.00 | E | C\&G | 85 |
| STILLWATER DRIVE | 1 | LAKESHORE DR N/S | CITY LIMITS NORTH | 2 | 790 | 30 | 23,700.00 | E | ROL | 85 |
| YEW AVENUE | 3 | 15TH ST E/S | END | 2 | 150 | 20 | 3,000.00 | E | NON | 85 |
| 16TH STREET | 1 | CALIFORNIA AVE N/S | END | 2 | 350 | 27 | 9,450.00 | E | C\&G | 84 |
| 2ND STREET | 9 | ANDERSON AVE N/S | CENTRAL AVE S/S | 2 | 220 | 30 | 6,600.00 | E | C\&G | 84 |
| 4TH STREET | 2 | KRUSE AVE N/S | JOHNSON AVE N/S | 2 | 535 | 42 | 22,470.00 | C | C\&G | 84 |
| 4TH STREET | 3 | JOHNSON AVE N/S | GOLDEN AVE S/S | 2 | 1,685.00 | 42 | 70,770.00 | C | CUR | 84 |
| 7TH STREET | 11 | HEMLOCK AVE N/S | IVY AVE N/S | 2 | 250 | 37 | 9,250.00 | E | C\&G | 84 |
| CANYON TERRACE | 1 | CANYON DR W/S | END | 2 | 315 | 20 | 6,300.00 | E | CUR | 84 |
| CENTRAL AVENUE | 3 | 10TH ST W/S | 8TH ST W/S | 3 | 645 | 41 | 26,445.00 | A | CUR | 84 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DONNELLY AVENUE | 1 | 4TH ST W/S | 6TH ST E/S | 2 | 500 | 24 | 12,000.00 | E | C\&G | 84 |
| KINGWOOD AVENUE | 2 | END | END | 2 | 1,070.00 | 23 | 24,610.00 | E | CUR | 84 |
| LINDBERG AVENUE | 1 | FIR AVE W/S | END | 2 | 1,245.00 | 33 | 41,085.00 | E | C\&G | 84 |
| MORRISON STREET | 3 | NEWMARK AVE N/S | END | 2 | 255 | 24 | 6,120.00 | E | C\&G | 84 |
| NICHOLLS AVENUE | 1 | EMPIRE BL E/S | MARPLE ST W/S | 2 | 245 | 24 | 5,880.00 | E | C\&G | 84 |
| OCEAN BOULEVARD | 4 | 28TH ST W/S | VINE AVE N/S | 4 | 2,625.00 | 51 | 133,875.00 | A | CUR | 84 |
| OCEAN BOULEVARD | 5 | VINE AVE N/S | NORMAN AVE W/S | 4 | 2,260.00 | 51 | 115,260.00 | A | CUR | 84 |
| SANFORD AVENUE | 3 | LAKESHORE DR S/S | CDS | 2 | 540 | 30 | 19,700.00 | E | ROL | 84 |
| TEAKWOOD AVENUE | 1 | 200' W/O 14TH ST | 14TH ST E/S | 2 | 230 | 32 | 7,360.00 | E | CUR | 84 |
| WALL STREET | 3 | SCHETTER AVE N/S | NEWMARK AVE N/S | 2 | 520 | 53 | 27,560.00 | E | C\&G | 84 |
| WOODLAND DRIVE | 1 | CITY LIMITS | MYRTLE AVE S/S | 3 | 2,700.00 | 37 | 99,900.00 | A | C\&G | 84 |
| 10TH STREET | 3 | 180' N/O COMMERCIAL AVE | 8TH TER S/S | 2 | 435 | 28 | 12,180.00 | A | CUR | 83 |
| 10TH STREET | 5 | DATE AVE N/S | HEMLOCK AVE N/S | 2 | 1,215.00 | 25 | 30,375.00 | A | C\&G | 83 |
| 13TH STREET | 2 | BIRCH AVE S/S | ADLER AVE N/S | 2 | 235 | 25 | 5,875.00 | E | CUR | 83 |
| 19TH STREET | 5 | OCEAN BL S/S | TIMBERLINE DR S/S | 2 | 205 | 35 | 7,175.00 | E | C\&G | 83 |
| 20TH STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 420 | 20 | 8,400.00 | E | C\&G | 83 |
| 21ST STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 215 | 16 | 3,440.00 | E | NON | 83 |
| 32ND STREET | 1 | N/S WALNUT AVE | LINDBERG AVE S/S | 2 | 380 | 33 | 12,540.00 | E | C\&G | 83 |
| 3RD COURT | 1 | DATE AVE N/S | END | 2 | 415 | 15 | 6,225.00 | E | NON | 83 |
| 4TH STREET | 10 | 2ND CT N/S | FIR AVE N/S | 2 | 120 | 20 | 2,400.00 | E | NON | 83 |
| 7TH STREET | 6 | HALL ST N/S | INGERSOLL AVE S/S | 2 | 630 | 39 | 24,570.00 | E | CUR | 83 |
| CALIFORNIA AVENUE | 1 | SOUTHWEST BL W/S | 16TH ST W/S | 2 | 1,615.00 | 20 | 32,300.00 | E | NON | 83 |
| COMMERCIAL AVENUE | 6 | 11TH ST W/S | 12TH ST E/S | 2 | 280 | 25 | 7,000.00 | A | CUR | 83 |
| DATE AVENUE |  | 10TH ST E/S | 8TH ST E/S | 2 | 535 | 25 | 13,375.00 | E | CUR | 83 |
| FENWICK AVENUE | 3 | LAKESHORE DR S/S | END | 2 | 665 | 34 | 22,610.00 | E | C\&G | 83 |
| LINCOLN BOULEVARD | 2 | OAKWAY DR E/S | OCEAN BL W/S | 2 | 275 | 35 | 9,625.00 | E | CUR | 83 |
| NEWMARK AVENUE | 2 | WALLACE ST W/S | CAMMANN ST W/S | 5 | 2,610.00 | 64 | 167,040.00 | A | CUR | 83 |
| NORMAN AVENUE | 1 | NEWMARK AVE N/S | END | 2 | 270 | 33 | 8,910.00 | E | C\&G | 83 |
| VIRGINIA AVENUE | 2 | CROCKER AVE E/S | CITY LIMITS EAST | 2 | 110 | 32 | 3,520.00 | E | C\&G | 83 |
| WALNUT AVENUE | 1 | FIR ST W/S | 34TH ST E/S | 2 | 745 | 33 | 24,585.00 | E | C\&G | 83 |
| 11TH STREET | 1 | INGERSOLL AVE N/S | FERGUSON AVE N/S | 2 | 1,475.00 | 36 | 53,100.00 | E | C\&G | 82 |
| 18TH AVENUE | 2 | FILBERT AVE N/S | CDS | 2 | 595 | 25 | 15,875.00 | E | NON | 82 |
| 28TH COURT | 2 | OCEAN BL S/S | TWIG TER S/S | 2 | 900 | 26 | 23,400.00 | E | CUR | 82 |
| 3RD STREET | 3 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | 2 | 220 | 29 | 6,380.00 | E | C\&G | 82 |
| APPLEWOOD DRIVE | 1 | 16TH AVE E/S | END | 2 | 870 | 16 | 13,920.00 | E | NON | 82 |
| BLANCO AVENUE | 3 | MADISON ST W/S | FILLMORE ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 82 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| FILLMORE STREET | 2 | FULTON AVE S/S | END | 2 | 430 | 32 | 13,760.00 | E | C\&G | 82 |
| FULTON AVENUE | 9 | FILLMORE ST E/S | END | 2 | 135 | 32 | 4,320.00 | E | C\&G | 82 |
| INGERSOLL AVENUE | 9 | FRON ST W/S | 1ST ST E/S | 2 | 220 | 33 | 7,260.00 | E | C\&G | 82 |
| LOCKHART AVENUE | 1 | 7TH ST E/S | BROADWAY AVE E/S | 2 | 1,520.00 | 44 | 66,880.00 | C | CUR | 82 |
| MASSEY LANE | 1 | HOSPITAL WY S/S | END | 2 | 395 | 40 | 15,800.00 | E | NON | 82 |
| NEWMARK AVENUE | 3 | CAMMANN ST W/S | EMPIRE BL W/S | 3 | 1,160.00 | 55 | 63,800.00 | A | CUR | 82 |
| OCEAN BOULEVARD | 3 | WOODLAND RD W/S | 28TH CT W/S | 5 | 3,410.00 | 41 | 139,810.00 | A | CUR | 82 |
| PACIFIC AVENUE | 1 | EMPIRE BL E/S | FILLMORE ST W/S | 2 | 1,845.00 | 34 | 62,730.00 | C | C\&G | 82 |
| PLYMOUTH AVENUE | 2 | MORRISON ST E/S | END | 2 | 360 | 24 | 8,640.00 | E | C\&G | 82 |
| TEAKWOOD AVENUE | 2 | 14TH ST E/S | KOOSBAY BL W/S | 2 | 520 | 30 | 15,600.00 | E | CUR | 82 |
| WOODLAND DRIVE | 2 | MYRTLE AVE S/S | OCEAN BL N/S | 2 | 980 | 37 | 36,260.00 | A | CUR | 82 |
| 10TH STREET | 2 | CENTRAL AVE N/S | 180' N/O COMMERCIAL AVE | 2 | 500 | 35 | 17,500.00 | A | CUR | 81 |
| 10TH STREET | 4 | 8TH TER S/S | DATE AVE N/S | 2 | 1,085.00 | 29 | 31,465.00 | A | C\&G | 81 |
| 10TH STREET | 6 | HEMLOCK AVE N/S | KOOSBAY BL S/S | 2 | 810 | 35 | 28,350.00 | A | CUR | 81 |
| 16TH STREET | 2 | MYRTLE AVE S/S | KINGWOOD AVE N/S | 2 | 445 | 34 | 15,130.00 | E | CUR | 81 |
| 1ST AVENUE | 1 | FINK ST N/S | D ST S/S | 2 | 200 | 24 | 4,800.00 | E | NON | 81 |
| BESSIE STREET | 1 | FINK ST N/S | END | 2 | 245 | 27 | 6,615.00 | E | NON | 81 |
| CAMMANN STREET | 8 | MICHIGAN AVE N/S | MONTGOMERY AVE N/S | 2 | 1,050.00 | 34 | 35,700.00 | E | C\&G | 81 |
| D STREET |  | 2ND AVE W/S | 1ST AVE E/S | 2 | 275 | 30 | 8,250.00 | C | NON | 81 |
| FENWICK AVENUE | 1 | MAXWELL RD S/S | ST JOHN ST S/S | 2 | 1,045.00 | 33 | 34,485.00 | E | C\&G | 81 |
| FULTON AVENUE | 5 | MORRISON ST E/S | 390' E/O MORRISON ST | 2 | 390 | 32 | 12,480.00 | E | C\&G | 81 |
| FULTON AVENUE | 8 | RADAR RD E/S | END | 2 | 225 | 34 | 7,650.00 | E | C\&G | 81 |
| HOLLAND AVENUE | 1 | MILL ST W/S | END | 2 | 450 | 56 | 25,200.00 | E | NON | 81 |
| HULL STREET | 1 | NEWMARK AVE N/S | CITY LIMITS | 2 | 75 | 34 | 2,550.00 | E | C\&G | 81 |
| JOHN AVENUE |  | LAKESHORE DR E/S | END EAST | 2 | 350 | 26 | 9,100.00 | E | C\&G | 81 |
| JOHNSON AVENUE | 4 | 7TH ST W/S | 10TH ST E/S | 2 | 725 | 25 | 18,125.00 | E | CUR | 81 |
| MINNESOTA AVENUE | 2 | 14TH ST W/S | END | 2 | 785 | 19 | 14,915.00 | E | C\&G | 81 |
| NEWMARK AVENUE | 1 | LA CLAIR ST E/S | WALLACE ST W/S | 3 | 1,765.00 | 48 | 92,720.00 | A | C\&G | 81 |
| TIDEVIEW TERRACE | 1 | CHICKSES DR E/S | SEABREEZE TERRACE E/S | 2 | 625 | 25 | 15,625.00 | E | C\&G | 81 |
| ELM AVENUE | 1 | 10TH CT E/S | END | 2 | 250 | 18 | 4,500.00 | E | NON | 80 |
| FULTON AVENUE | 4 | MADISON ST W/S | MORRISON ST W/S | 2 | 495 | 32 | 15,840.00 | E | C\&G | 80 |
| HIGHLAND AVENUE |  | BROADWAY ST W/S | 2ND ST E/S | 2 | 205 | 24 | 4,920.00 | E | CUR | 80 |
| JOHNSON AVENUE | 5 | BROADWAY ST E/S | 1ST ST W/S | 3 | 205 | 56 | 11,480.00 | C | CUR | 80 |
| KENTUCKY AVENUE | 2 | JEFFERSON ST E/S | MORRISON ST W/S | 2 | 1,460.00 | 24 | 35,040.00 | E | C\&G | 80 |
| LAKESHORE DRIVE | 4 | CROCKER AVE E/S | CITY LIMITS EAST | 2 | 1,600.00 | 25 | 40,000.00 | C | C\&G | 80 |
| MADISON STREET | 4 | PACIFIC AVE N/S | GARFIELD AVE S/S | 2 | 225 | 35 | 7,875.00 | E | CUR | 80 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MYRTLE AVENUE | 1 | BAYSHORE DR W/S | 6TH ST E/S | 2 | 185 | 36 | 6,660.00 | E | C\&G | 80 |
| OCEAN BOULEVARD | 6 | NORMAN AVE W/S | NEWMARK AVE S/S | 4 | 1,825.00 | 51 | 93,075.00 | A | CUR | 80 |
| SANFORD AVENUE | 1 | END NORTH | VIRGINIA AVE N/S | 2 | 185 | 35 | 6,475.00 | E | C\&G | 80 |
| SCHETTER AVENUE | 1 | MARPLE ST E/S | WALL ST W/S | 2 | 265 | 50 | 13,250.00 | E | C\&G | 80 |
| THOMPSON ROAD | 1 | KOOSBAY BL W/S | 15TH CT W/S | 2 | 1,340.00 | 35 | 46,900.00 | C | C\&G | 80 |
| VINE AVENUE | 1 | 34TH ST W/S | OCEAN BL E/S | 2 | 425 | 33 | 14,025.00 | E | C\&G | 80 |
| 13TH COURT | 2 | F ST N/S | END | 2 | 305 | 18 | 5,490.00 | E | NON | 79 |
| 9TH AVENUE | 2 | F ST S/S | H ST N/S | 2 | 915 | 23 | 21,045.00 | E | NON | 79 |
| 9TH AVENUE | 3 | H ST N/S | I ST S/S | 2 | 250 | 24 | 6,000.00 | E | NON | 79 |
| CHICKSES DRIVE | 1 | END NORTH | LAKESHORE DR N/S | 2 | 585 | 33 | 19,305.00 | E | C\&G | 79 |
| DATE AVENUE | 2 | 8TH ST E/S | TELEGRAPH DR E/S | 2 | 1,205.00 | 34 | 40,970.00 | E | CUR | 79 |
| F STREET | 1 | 6TH ST E/S | 9TH AVE W/S | 2 | 870 | 29 | 25,230.00 | E | C\&G | 79 |
| F STREET | 3 | 10TH AVE W/S | 12TH AVE E/S | 2 | 560 | 23 | 12,880.00 | E | C\&G | 79 |
| FERN COURT | 1 | EVERGREEN DR W/S | CDS | 2 | 240 | 34 | 9,160.00 | E | C\&G | 79 |
| FRONT STREET | 1 | JOHNSON AVE N/S | INGERSOLL AVE N/S | 2 | 565 | 22 | 12,430.00 | E | C\&G | 79 |
| FULTON AVENUE | 3 | CAMMANN ST W/S | END | 2 | 325 | 17 | 5,525.00 | E | C\&G | 79 |
| HIGHLAND AVENUE | 2 | 2ND ST W/S | 5TH ST E/S | 2 | 755 | 25 | 18,875.00 | E | CUR | 79 |
| LAKESHORE DRIVE | 2 | CHICKSES DR W/S | SEABREEZE TER E/S | 2 | 920 | 34 | 31,280.00 | C | C\&G | 79 |
| MADISON STREET | 3 | FULTON AVE N/S | PACIFIC AVE S/S | 2 | 1,005.00 | 35 | 35,175.00 | E | C\&G | 79 |
| MILL STREET | 1 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 515 | 28 | 14,420.00 | E | NON | 79 |
| OCEAN BOULEVARD | 2 | LINCOLN RD N/S | WOODLAND RD W/S | 3 | 2,435.00 | 67 | 163,145.00 | A | CUR | 79 |
| TAYLOR AVENUE | 2 | WALL ST W/S | WASSON ST W/S | 2 | 300 | 32 | 9,600.00 | E | CUR | 79 |
| VIRGINIA AVENUE | , | FENWICK AVE E/S | CROCKER AVE W/S | 2 | 505 | 34 | 17,170.00 | E | C\&G | 79 |
| 15TH STREET | 1 | THOMPSON RD N/S | END | 2 | 620 | 27 | 16,740.00 | E | NON | 78 |
| 17TH STREET | 2 | MYRTLE AVE S/S | KINGWOOD AVE N/S | 2 | 400 | 35 | 14,000.00 | E | CUR | 78 |
| 2ND STREET | 7 | CURTIS AVE N/S | ANDERSON AVE S/S | 2 | 465 | 38 | 21,470.00 | E | CUR | 78 |
| 3RD AVENUE | 1 | D ST S/S | E ST N/S | 2 | 355 | 24 | 8,520.00 | E | NON | 78 |
| 3RD STREET | 2 | CENTRAL AVE S/S | ANDERSON AVE N/S | 2 | 225 | 28 | 6,300.00 | E | C\&G | 78 |
| 8TH LOOP | 1 | BIRCH AVE N/S | 8TH ST W/S | 2 | 330 | 22 | 7,260.00 | E | CUR | 78 |
| ANDERSON AVENUE | 3 | 7TH ST W/S | 10TH ST E/S | 2 | 895 | 35 | 31,325.00 | E | CUR | 78 |
| BIRCH AVENUE | 2 | 8TH ST W/S | END | 2 | 160 | 22 | 3,520.00 | E | CUR | 78 |
| CALIFORNIA AVENUE | 2 | 16TH ST W/S | 19TH ST E/S | 2 | 860 | 22 | 18,920.00 | E | NON | 78 |
| COMMERCIAL AVENUE | 4 | 8TH ST W/S | 10TH ST E/S | 2 | 605 | 35 | 21,175.00 | A | CUR | 78 |
| COMMERCIAL AVENUE | 5 | 10TH ST W/S | 11TH ST E/S | 2 | 290 | 29 | 8,410.00 | A | CUR | 78 |
| JOHNSON AVENUE | 6 | 1ST ST E/S | FRONT ST W/S | 5 | 220 | 55 | 12,100.00 | C | CUR | 78 |
| LAKESHORE DRIVE | 1 | TAYLOR AVE N/S | CHICKSES DR W/S | 2 | 1,440.00 | 28 | 40,320.00 | C | NON | 78 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MADISON STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE S/S | 2 | 235 | 30 | 7,050.00 | E | C\&G | 78 |
| SPRUCE AVENUE | 2 | 14TH ST W/S | 16TH ST E/S | 2 | 570 | 18 | 10,260.00 | E | NON | 78 |
| THOMPSON ROAD | 3 | KINNEY RD E/S | WOODLAND DR E/S | 2 | 575 | 36 | 20,700.00 | C | C\&G | 78 |
| 4TH STREET | 1 | LOCKHART AVE N/S | KRUSE AVE N/S | 2 | 570 | 44 | 25,080.00 | C | CUR | 77 |
| 6TH STREET | 4 | ELROD AVE S/S | CDS | 2 | 305 | 24 | 7,920.00 | E | CUR | 77 |
| 7TH AVENUE | 4 | I ST N/S | H ST N/S | 2 | 260 | 14 | 3,640.00 | E | NON | 77 |
| 7TH STREET | 3 | DONNELLY AVE N/S | ELROD AVE N/S | 2 | 255 | 36 | 9,180.00 | E | CUR | 77 |
| COMMERCIAL AVENUE | 2 | BROADWAY ST W/S | 7TH ST W/S | 2 | 1,565.00 | 42 | 65,730.00 | A | CUR | 77 |
| EMPIRE BOULEVARD | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | 2 | 525 | 24 | 12,600.00 | A | NON | 77 |
| GOLDEN AVENUE | 4 | BROADWAY ST E/S | FIRST ST W/S | 2 | 325 | 58 | 18,850.00 | E | C\&G | 77 |
| HALL AVENUE | 4 | ALLEY E/S | BROADWAY ST W/S | 2 | 160 | 30 | 4,800.00 | E | CUR | 77 |
| MICHIGAN AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST E/S | 2 | 405 | 35 | 14,175.00 | E | CUR | 77 |
| MONTGOMERY AVENUE | 3 | WALL ST E/S | WASSON ST W/S | 2 | 265 | 33 | 8,745.00 | E | C\&G | 77 |
| MORRISON STREET | 6 | MICHIGAN AVE N/S | MONTGOMERY AVE S/S | 2 | 1,085.00 | 34 | 36,890.00 | C | C\&G | 77 |
| NOBLE AVENUE | 2 | WASSON ST W/S | WALL ST E/S | 2 | 265 | 33 | 8,745.00 | E | C\&G | 77 |
| NOBLE AVENUE | 4 | MARPLE ST W/S | EMPIRE BL E/S | 2 | 250 | 33 | 8,250.00 | E | C\&G | 77 |
| OCEAN BOULEVARD | 1 | CENTRAL AVE N/S | LINCOLN RD N/S | 3 | 2,660.00 | 57 | 151,620.00 | A | CUR | 77 |
| SALMON AVENUE | 2 | SCHONEMAN ST E/S | END | 2 | 460 | 32 | 14,720.00 | E | C\&G | 77 |
| SCHETTER AVENUE | 2 | WALL ST E/S | WASSON ST W/S | 2 | 260 | 54 | 14,040.00 | E | C\&G | 77 |
| SOUTHWEST BOULEVARD | 2 | PENNSYLVANIA AVE S/S | MONTANA AVE S/S | 2 | 1,270.00 | 36 | 45,720.00 | A | C\&G | 77 |
| 10TH COURT | 2 | HEMLOCK AVE N/S | END | 2 | 240 | 14 | 3,360.00 | E | NON | 76 |
| 5TH AVENUE | 1 | D ST N/S | END | 2 | 220 | 25 | 5,500.00 | E | NON | 76 |
| 7TH ROAD | 1 | FIR AVE S/S | 3RD CT N/S | 2 | 185 | 35 | 6,475.00 | E | C\&G | 76 |
| 7TH STREET | 10 | HEMLOCK AVE S/S | END | 2 | 675 | 32 | 21,600.00 | E | C\&G | 76 |
| 8TH STREET | 13 | DATE AVE S/S | BIRCH AVE S/S | 2 | 660 | 26 | 17,160.00 | E | CUR | 76 |
| 8TH TERRACE | 1 | 8TH ST W/S | 10TH ST E/S | 2 | 640 | 25 | 16,000.00 | E | CUR | 76 |
| CENTRAL AVENUE | 1 | OCEAN BL E/S | 12TH ST E/S | 2 | 690 | 30 | 20,700.00 | A | CUR | 76 |
| D STREET | 5 | 1ST AVE E/S | WHITTY ST W/S | 2 | 645 | 33 | 21,285.00 | C | C\&G | 76 |
| DATE AVENUE | 4 | 10TH ST W/S | 10TH CT W/S | 2 | 250 | 18 | 4,500.00 | E | NON | 76 |
| GARFIELD AVENUE | 1 | MORRISON ST E/S | END | 2 | 365 | 33 | 12,045.00 | E | C\&G | 76 |
| LAUREL AVENUE | 1 | 14TH ST W/S | END | 2 | 245 | 26 | 6,370.00 | E | C\&G | 76 |
| LISA PLACE | 1 | KENTUCKY AVE S/S | CDS | 2 | 235 | 33 | 8,655.00 | E | C\&G | 76 |
| MADISON STREET | 5 | GARFIELD AVE N/S | MICHIGAN AVE S/S | 2 | 1,265.00 | 35 | 44,275.00 | E | CUR | 76 |
| MYRTLE AVENUE | 2 | 17TH ST W/S | 14TH ST W/S | 2 | 975 | 35 | 34,125.00 | E | CUR | 76 |
| NOBLE AVENUE | 5 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 34 | 15,810.00 | E | C\&G | 76 |
| OCEAN TERRACE | 1 | LINCOLN RD N/S | WEST HILLS BL E/S | 2 | 570 | 16 | 9,120.00 | E | CUR | 76 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| THOMPSON ROAD | 2 | 15TH CT W/S | KINNEY RD E/S | 2 | 1,895.00 | 37 | 70,115.00 | C | C\&G | 76 |
| WEBSTER AVENUE | 1 | MADISON ST W/S | END | 2 | 445 | 33 | 14,685.00 | E | C\&G | 76 |
| 11TH STREET | 3 | SPRUCE AVE N/S | END SOUTH | 2 | 325 | 18 | 5,850.00 | E | CUR | 75 |
| 13TH STREET | 3 | HIGHLAND AVE S/S | COMMERCIAL AVE N/S | 2 | 335 | 19 | 6,365.00 | E | NON | 75 |
| 14TH COURT | 1 | D ST N/S | END | 2 | 200 | 13 | 2,600.00 | E | NON | 75 |
| 2ND STREET | 10 | CENTRAL AVE N/S | COMMERCIAL AVE S/S | 2 | 220 | 30 | 6,600.00 | E | C\&G | 75 |
| 2ND STREET | 11 | COMMERCIAL AVE N/S | MARKET AVE S/S | 2 | 215 | 41 | 8,815.00 | E | C\&G | 75 |
| 35TH STREET | 1 | VINE AVE N/S | LINDBERG AVE S/S | 2 | 665 | 33 | 18,645.00 | E | C\&G | 75 |
| 7TH AVENUE | 3 | D ST N/S | END | 2 | 240 | 22 | 5,280.00 | E | NON | 75 |
| 7TH STREET | 13 | HEMLOCK AVE S/S | END | 2 | 315 | 33 | 10,395.00 | E | C\&G | 75 |
| 8TH AVENUE | 2 | D ST S/S | E ST N/S | 2 | 435 | 22 | 9,570.00 | E | NON | 75 |
| ACKERMAN STREET | 1 | NEWMARK AVE N/S | END | 2 | 1,265.00 | 33 | 41,745.00 | E | C\&G | 75 |
| ARAGO AVENUE | 3 | MADISON ST W/S | FILLMORE ST E/S | 2 | 465 | 33 | 15,345.00 | E | CUR | 75 |
| BLANCO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 75 |
| CROCKER AVENUE | 4 | ST JOHN N/S | END | 2 | 800 | 35 | 28,000.00 | E | C\&G | 75 |
| HEMLOCK AVENUE | 2 | 10TH ST W/S | 13TH ST E/S | 2 | 1,015.00 | 29 | 29,435.00 | E | CUR | 75 |
| MONTGOMERY AVENUE | 1 | MARPLE ST W/S | CDS | 2 | 200 | 30 | 6,500.00 | E | C\&G | 75 |
| MORRISON STREET | 10 | BLANCO AVE S/S | MARSHALL AVE S/S | 2 | 1,035.00 | 33 | 34,155.00 | E | C\&G | 75 |
| NOBLE AVENUE | 3 | WALL ST W/S | MARPLE ST E/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 75 |
| SPRUCE AVENUE | 1 | 11TH ST W/S | END | 2 | 140 | 20 | 2,800.00 | E | CUR | 75 |
| WISCONSIN AVENUE | 1 | EMPIRE BL E/S | END | 2 | 375 | 33 | 12,375.00 | E | C\&G | 75 |
| 14TH STREET | 1 | JUNIPER AVE N/S | MYRTLE AVE S/S | 2 | 925 | 30 | 27,750.00 | E | CUR | 74 |
| 16TH COURT | 1 | THOMPSON RD N/S | END | 2 | 50 | 15 | 750 | E | NON | 74 |
| 4TH STREET | 4 | GOLDEN AVE S/S | CURTIS AVE S/S | 2 | 1,140.00 | 54 | 62,560.00 | C | CUR | 74 |
| 7TH AVENUE | 2 | E ST N/S | D ST S/S | 2 | 435 | 30 | 13,050.00 | E | NON | 74 |
| 7TH STREET | 5 | FERGUSON AVE S/S | HALL ST N/S | 2 | 865 | 39 | 33,735.00 | E | CUR | 74 |
| COTTONWOOD AVENUE | 1 | JUNIPER AVE N/S | END | 2 | 1,720.00 | 29 | 49,880.00 | E | CUR | 74 |
| CROCKER AVENUE | 1 | ST JOHN N/S | HOWARD ST N/S | 2 | 470 | 35 | 16,450.00 | E | C\&G | 74 |
| FILBERT AVENUE | 2 | 18TH AVE E/S | END | 2 | 895 | 23 | 20,585.00 | E | NON | 74 |
| INGERSOLL AVENUE | 7 | 10TH ST E/S | 11TH ST W/S | 2 | 405 | 35 | 14,175.00 | E | CUR | 74 |
| JUNIPER AVENUE | 5 | 14TH ST W/S | 13TH ST E/S | 2 | 430 | 29 | 12,470.00 | E | CUR | 74 |
| KENTUCKY AVENUE | 3 | MORRISON ST E/S | 125' W/O TRICIA PL | 2 | 395 | 24 | 9,480.00 | E | C\&G | 74 |
| LINDY LANE | 1 | OCEAN BL S/S | END | 2 | 75 | 26 | 1,950.00 | E | NON | 74 |
| MARKET AVENUE | 1 | 1ST ST W/S | BROADWAY E/S | 2 | 205 | 39 | 7,995.00 | E | C\&G | 74 |
| SOUTHWEST BOULEVARD | 4 | WASHINGTON AVE S/S | 7TH ST E/S | 2 | 2,245.00 | 37 | 83,065.00 | A | CUR | 74 |
| WALL STREET | 1 | TAYLOR AVE S/S | HARRIS AVE S/S | 2 | 1,025.00 | 36 | 36,900.00 | E | CUR | 74 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WALL STREET | 6 | PACIFIC AVE S/S | FULTON AVE N/S | 2 | 1,005.00 | 33 | 33,165.00 | E | C\&G | 74 |
| 10TH STREET | 1 | ELROD AVE N/S | CENTRAL AVE S/S | 2 | 1,285.00 | 35 | 44,975.00 | C | CUR | 73 |
| 19TH STREET | 4 | THOMPSON RD S/S | END | 2 | 650 | 33 | 21,450.00 | E | C\&G | 73 |
| 8TH STREET | 11 | COMMERCIAL AVE N/S | 8TH TERR N/S | 2 | 270 | 32 | 8,640.00 | E | CUR | 73 |
| 9TH STREET | 2 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | 2 | 320 | 23 | 7,360.00 | E | CUR | 73 |
| AUGUSTINE AVENUE | 2 | LAKESHORE DR S/S | END SOUTH | 2 | 665 | 33 | 21,945.00 | E | C\&G | 73 |
| HIGHLAND AVENUE | 3 | OCEAN BL E/S | 13TH ST E/S | 2 | 535 | 17 | 9,095.00 | E | NON | 73 |
| JOHNSON AVENUE | 2 | 4TH ST W/S | 5TH ST E/S | 2 | 345 | 39 | 13,455.00 | E | CUR | 73 |
| JUNIPER AVENUE | 3 | COTTONWODD AVE E/S | BUTLER RD W/S | 2 | 235 | 30 | 7,050.00 | E | CUR | 73 |
| JUNIPER AVENUE | 7 | MYRTLE AVE S/S | 20TH ST E/S | 2 | 505 | 33 | 16,665.00 | E | C\&G | 73 |
| MARPLE STREET | 4 | NEWMARK AVE N/S | SCHETTER AVE N/S | 2 | 515 | 52 | 26,780.00 | E | C\&G | 73 |
| MICHIGAN AVENUE | 7 | SCHONEMAN ST E/S | END | 2 | 450 | 35 | 15,750.00 | E | CUR | 73 |
| OAKWAY COURT | 1 | OAKWAY DR WIS | END | 2 | 85 | 33 | 2,805.00 | E | C\&G | 73 |
| OAKWAY DRIVE | 1 | WEST HILLS BL S/S | LINCOLN RD N/S | 2 | 460 | 34 | 15,640.00 | E | C\&G | 73 |
| PACIFIC AVENUE | 2 | FILLMORE AVE W/S | MORRISON ST W/S | 2 | 995 | 34 | 33,830.00 | C | CUR | 73 |
| SALMON AVENUE | 1 | MORRISON ST E/S | SCHONEMAN ST W/S | 2 | 365 | 34 | 12,410.00 | E | C\&G | 73 |
| TAYLOR AVENUE | 1 | MARPLE ST W/S | WALL ST W/S | 2 | 220 | 34 | 7,480.00 | E | CUR | 73 |
| TAYLOR AVENUE | 3 | WASSON ST E/S | CAMMANN ST W/S | 2 | 260 | 33 | 8,580.00 | E | CUR | 73 |
| YEW STREET | 1 | 35TH ST W/S | END | 2 | 240 | 33 | 7,920.00 | E | C\&G | 73 |
| 34TH STREET | 1 | LINDBERG AVE S/S | OCEAN BL N/S | 2 | 1,195.00 | 36 | 43,020.00 | E | C\&G | 72 |
| COMPASS CIRCLE | 1 | RADAR RD E/S | CDS | 2 | 190 | 33 | 7,370.00 | E | C\&G | 72 |
| DENISE PLACE | 1 | KENTUCKY AVE N/S | CDS | 2 | 410 | 34 | 14,840.00 | E | C\&G | 72 |
| FIR STREET | 1 | NEWMARK AVE S/S | WALNUT AVE S/S | 2 | 1,815.00 | 35 | 63,525.00 | E | C\&G | 72 |
| LIMNELL STREET | 1 | FINK ST S/S | END | 2 | 180 | 26 | 4,680.00 | E | NON | 72 |
| MONTGOMERY AVENUE | 2 | MARPLE ST E/S | WALL ST W/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 72 |
| PARK AVENUE | 3 | 4TH ST W/S | BROADWAY ST W/S | 2 | 675 | 34 | 22,950.00 | E | CUR | 72 |
| WASSON STREET | 3 | SCHETTER AVE S/S | NEWMARK AVE N/S | 2 | 475 | 34 | 16,150.00 | C | C\&G | 72 |
| WEBSTER AVENUE | 2 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 72 |
| WEBSTER AVENUE | 3 | MORRISON ST E/S | END | 2 | 380 | 33 | 12,540.00 | E | C\&G | 72 |
| 4TH AVENUE | 1 | E ST N/S | D ST S/S | 2 | 435 | 22 | 9,570.00 | E | NON | 71 |
| 8TH STREET | 9 | JOHNSON AVE S/S | END | 2 | 525 | 29 | 15,225.00 | E | CUR | 71 |
| ARAGO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 71 |
| GARFIELD AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | 2 | 465 | 33 | 15,345.00 | E | C\&G | 71 |
| I STREET | 2 | H ST N/S | I ST S/S | 2 | 525 | 20 | 10,500.00 | E | NON | 71 |
| KOOSBAY BOULEVARD | 1 | BAYSHORE DR W/S | 10TH ST E/S | 2 | 1,615.00 | 36 | 58,140.00 | C | C\&G | 71 |
| MARYLAND AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 34 | 15,810.00 | E | C\&G | 71 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MERRILL STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | 2 | 685 | 33 | 22,605.00 | E | C\&G | 71 |
| NEWMARK AVENUE | 5 | MILL ST W/S | END | 2 | 425 | 23 | 9,775.00 | E | NON | 71 |
| NOBLE AVENUE | 1 | CAMMANN ST W/S | WASSON ST E/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 71 |
| WASSON STREET | 2 | HARRIS AVE N/S | SCHETTER AVE S/S | 2 | 1,060.00 | 34 | 36,040.00 | C | C\&G | 71 |
| 5TH STREET | 12 | BENNETT AVE N/S | ANDERSON AVE S/S | 2 | 220 | 36 | 7,920.00 | E | CUR | 70 |
| 6TH STREET | 3 | BENNETT AVE S/S | ELROD AVE N/S | 2 | 770 | 24 | 18,480.00 | E | CUR | 70 |
| CEDAR AVENUE | 3 | 16TH AVE W/S | END | 2 | 705 | 21 | 14,805.00 | E | NON | 70 |
| COMMERCIAL AVENUE | 3 | 7TH ST W/S | 8TH ST W/S | 2 | 300 | 33 | 9,900.00 | A | CUR | 70 |
| INGERSOLL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 2 | 230 | 38 | 8,740.00 | E | C\&G | 70 |
| KOOSBAY BOULEVARD | 2 | 10TH ST E/S | TEAKWOOD AVE S/S | 2 | 2,170.00 | 30 | 65,100.00 | A | CUR | 70 |
| MORRISON STREET | 2 | PIRATES CT S/S | HARRIS AVE N/S | 2 | 1,190.00 | 26 | 30,940.00 | C | NON | 70 |
| PINE AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | 2 | 515 | 36 | 18,540.00 | E | CUR | 70 |
| 19TH STREET | 3 | JUNIPER AVE S/S | COTTONWOOD AVE S/S | 2 | 290 | 28 | 8,120.00 | E | CUR | 69 |
| 4TH STREET | 7 | COMMERCIAL AVE N/S | MARKET AVE S/S | 3 | 215 | 52 | 11,180.00 | C | C\&G | 69 |
| AUGUSTINE AVENUE | 1 | END NORTH | LAKESHORE DR N/S | 2 | 1,600.00 | 34 | 54,400.00 | E | C\&G | 69 |
| JOHN AVENUE | 1 | END WEST | LAKESHORE DR W/S | 2 | 275 | 15 | 4,125.00 | E | NON | 69 |
| LEAF TERRACE | 1 | 28TH CT W/S | END | 2 | 495 | 23 | 11,885.00 | E | NON | 69 |
| NOBLE AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST W/S | 2 | 375 | 34 | 12,750.00 | E | C\&G | 69 |
| PARK AVENUE | 2 | 4TH CT W/S | 4TH ST W/S | 2 | 230 | 25 | 5,750.00 | E | CUR | 69 |
| THOMAS STREET | 1 | LA CLAIR ST E/S | END | 2 | 605 | 35 | 21,175.00 | E | C\&G | 69 |
| 12TH STREET | 1 | INGERSOLL AVE N/S | END | 2 | 210 | 30 | 6,300.00 | E | NON | 68 |
| 13TH AVENUE | 1 | D ST S/S | END | 2 | 300 | 23 | 6,900.00 | E | NON | 68 |
| 15TH STREET | 2 | MYRTLE AVE N/S | END | 2 | 320 | 31 | 9,920.00 | E | CUR | 68 |
| BENNETT AVENUE | 1 | 4TH ST W/S | 6TH ST W/S | 2 | 510 | 35 | 17,850.00 | E | CUR | 68 |
| COMMERCIAL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 2 | 185 | 42 | 7,770.00 | A | CUR | 68 |
| ELM STREET | 1 | 7TH RD E/S | END | 2 | 195 | 18 | 3,510.00 | E | NON | 68 |
| ELROD AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 2 | 90 | 38 | 3,420.00 | E | C\&G | 68 |
| WALL STREET | 5 | MICHIGAN AVE S/S | PACIFIC AVE N/S | 2 | 1,515.00 | 33 | 49,995.00 | E | C\&G | 68 |
| 7TH ROAD | 2 | 3RD CT N/S | DATE AVE N/S | 2 | 485 | 33 | 16,005.00 | E | C\&G | 67 |
| CYPRESS POINT | 1 | A ST N/S | END | 2 | 295 | 19 | 5,605.00 | E | NON | 67 |
| JOHNSON AVENUE | 3 | 5TH ST W/S | 7TH ST W/S | 2 | 385 | 39 | 15,015.00 | E | CUR | 67 |
| KRUSE AVENUE | 1 | BROADWAY ST W/S | 4TH ST E/S | 2 | 1,040.00 | 40 | 41,600.00 | E | CUR | 67 |
| LAKESHORE DRIVE | 3 | SEABREEZE TER E/S | CROCKER AVE E/S | 2 | 1,355.00 | 34 | 46,070.00 | C | C\&G | 67 |
| SEABREEZE TERRACE | 2 | LAKESHORE DR S/S | LAKEWOOD LN N/S | 2 | 490 | 26 | 12,740.00 | E | C\&G | 67 |
| ZANNA PLACE | 1 | KENTUCKY AVE S/S | CDS | 2 | 235 | 33 | 8,655.00 | E | C\&G | 67 |
| 4TH COURT | 2 | PARK AVE N/S | 205' N/O PARK AVE | 2 | 205 | 18 | 3,690.00 | E | CUR | 66 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4TH STREET | 6 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | 2 | 480 | 53 | 25,440.00 | C | C\&G | 66 |
| 6TH STREET | 2 | ANDERSON AVE S/S | BENNETT AVE N/S | 2 | 225 | 28 | 6,300.00 | E | CUR | 66 |
| 6TH STREET | 7 | KINGWOOD AVE N/S | MYRTLE AVE S/S | 2 | 325 | 41 | 13,325.00 | E | C\&G | 66 |
| 7TH STREET | 4 | ELROD AVE N/S | FERGUSON AVE S/S | 2 | 290 | 36 | 10,440.00 | E | CUR | 66 |
| BARHAM TERRACE | 1 | PARK RD W/S | CDS | 2 | 210 | 26 | 6,460.00 | E | NON | 66 |
| MAIN STREET | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | 2 | 325 | 55 | 17,875.00 | E | C\&G | 66 |
| MYRTLE AVENUE | 4 | JUNIPER AVE E/S | WOODLAND AVE E/S | 2 | 490 | 32 | 15,680.00 | E | C\&G | 66 |
| SCHONEMAN STREET | 2 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 550 | 33 | 18,150.00 | E | C\&G | 66 |
| SEAGATE STREET |  | LAKESHORE DR S/S | END SOUTH | 2 | 715 | 33 | 23,595.00 | E | C\&G | 66 |
| TWIG TERRACE | 1 | 28TH CT W/S | CDS | 2 | 475 | 23 | 11,425.00 | E | NON | 66 |
| 10TH AVENUE | 2 | E ST S/S | F ST N/S | 2 | 435 | 26 | 11,310.00 | E | NON | 65 |
| 12TH AVENUE | 2 | F ST N/S | E ST S/S | 2 | 435 | 24 | 10,440.00 | E | NON | 65 |
| 13TH STREET | 1 | JUNIPER AVE S/S | HEMLOCK AVE S/S | 2 | 340 | 32 | 10,880.00 | E | CUR | 65 |
| 5TH STREET | 13 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | 2 | 475 | 36 | 19,900.00 | E | CUR | 65 |
| 6TH STREET | 6 | KOOSBAY BL N/S | KINGWOOD AVE S/S | 2 | 320 | 41 | 13,120.00 | E | CUR | 65 |
| 9TH AVENUE | 1 | E ST N/S | D ST S/S | 2 | 435 | 36 | 15,660.00 | E | NON | 65 |
| FIR AVENUE | 2 | 7TH CT W/S | 4TH ST W/S | 2 | 640 | 21 | 13,440.00 | E | C\&G | 65 |
| MYRTLE AVENUE | 3 | 14TH ST E/S | END | 2 | 415 | 22 | 9,130.00 | E | NON | 65 |
| SANFORD AVENUE | 2 | VIRGINIA AVE S/S | LAKESHORE DR N/S | 2 | 2,240.00 | 34 | 76,160.00 | E | C\&G | 65 |
| SHON-STA WAY | 1 | CANYON DR E/S | END | 2 | 245 | 25 | 6,125.00 | E | NON | 65 |
| 17TH STREET | 3 | I ST N/S | EVERGREEN ST N/S | 2 | 1,275.00 | 22 | 28,050.00 | E | NON | 64 |
| 5TH AVENUE | 2 | D ST S/S | E ST N/S | 2 | 435 | 23 | 10,005.00 | E | NON | 64 |
| ELROD AVENUE | 5 | 10TH ST W/S | 12TH ST W/S | 2 | 575 | 25 | 14,375.00 | E | CUR | 64 |
| KNOT TERRACE | 1 | 28TH CT W/S | END | 2 | 535 | 23 | 12,305.00 | E | NON | 64 |
| MICHIGAN AVENUE | 4 | CAMMANN ST E/S | MADISON ST E/S | 2 | 525 | 44 | 23,100.00 | E | C\&G | 64 |
| 1STCOURT | 1 | A ST S/S | END | 2 | 135 | 13 | 1,755.00 | E | NON | 63 |
| 9TH STREET | 7 | DATE AVE S/S | END | 2 | 875 | 27 | 23,625.00 | E | CUR | 63 |
| CAMMANN STREET | 10 | PACIFIC AVE S/S | END | 2 | 1,500.00 | 33 | 49,500.00 | E | C\&G | 63 |
| CROCKER AVENUE | 3 | LAKESHORE DR S/S | END | 2 | 690 | 35 | 24,150.00 | E | C\&G | 63 |
| D STREET | 1 | HARBORVIEW DR W/S | COOS RIVER HWY E/S | 2 | 495 | 21 | 10,395.00 | C | NON | 63 |
| EVERGREEN DRIVE | 1 | TIMBERLINE DR E/S | TIMBERLINE DR S/S | 2 | 655 | 34 | 22,270.00 | E | C\&G | 63 |
| FINK STREET | 1 | WHITTY ST W/S | BESSIE ST E/S | 2 | 500 | 24 | 12,000.00 | E | NON | 63 |
| GOLDEN AVENUE | 1 | 7TH ST E/S | 5TH ST E/S | 2 | 400 | 36 | 14,400.00 | E | CUR | 63 |
| GOLDEN AVENUE | 3 | 4TH ST E/S | BROADWAY ST W/S | 2 | 700 | 50 | 35,000.00 | E | C\&G | 63 |
| IVY AVENUE | 1 | BAYSHORE DR W/S | 7TH ST E/S | 2 | 585 | 37 | 21,645.00 | E | C\&G | 63 |
| MONTGOMERY AVENUE | 5 | MORRISON ST W/S | END | 2 | 235 | 32 | 7,520.00 | E | C\&G | 63 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 19TH STREET | 1 | CALIFORNIA AVE S/S | END | 2 | 660 | 33 | 21,780.00 | E | C\&G | 62 |
| CANYON DRIVE | 2 | SHONSTA WY N/S | CANYON TERR S/S | 2 | 540 | 20 | 10,800.00 | E | CUR | 62 |
| CROCKER AVENUE | 2 | HOWARD ST N/S | LAKESHORE DR N/S | 2 | 1,200.00 | 35 | 42,000.00 | E | C\&G | 62 |
| DUNN STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | 2 | 590 | 34 | 20,060.00 | E | C\&G | 62 |
| LINDBERG AVENUE | 2 | BRULE ST W/S | END | 2 | 525 | 35 | 18,375.00 | E | C\&G | 62 |
| MARPLE STREET | 3 | MICHIGAN AVE N/S | NEWMARK AVE S/S | 2 | 465 | 54 | 25,110.00 | E | C\&G | 62 |
| MARPLE STREET | 7 | HARRIS AVE S/S | GRANT AVE N/S | 2 | 560 | 32 | 17,920.00 | E | CUR | 62 |
| WALLACE STREET | 1 | NEWMARK AVE S/S | OCEAN BL N/S | 2 | 615 | 37 | 22,755.00 | E | C\&G | 62 |
| 12TH COURT | 1 | FERGUSON AVE N/S | END | 2 | 405 | 21 | 8,505.00 | E | CUR | 61 |
| 15TH COURT | 1 | THOMPSON RD N/S | END | 2 | 530 | 25 | 13,250.00 | E | NON | 61 |
| 15TH STREET | 3 | MYRTLE AVE S/S | END | 2 | 425 | 32 | 13,600.00 | E | NON | 61 |
| 7TH STREET | 8 | JOHNSON AVE S/S | KRUSE AVE N/S | 2 | 545 | 33 | 17,985.00 | E | C\&G | 61 |
| D STREET | 2 | 6TH AVE W/S | 5TH AVE W/S | 2 | 275 | 39 | 10,725.00 | C | NON | 61 |
| ELROD AVENUE | 3 | 4TH ST W/S | 7TH ST E/S | 2 | 750 | 35 | 26,250.00 | C | CUR | 61 |
| FENWICK AVENUE | 2 | ST JOHN ST S/S | LAKESHORE DR N/S | 2 | 1,625.00 | 35 | 56,875.00 | E | C\&G | 61 |
| MARKET AVENUE | 3 | 4TH ST W/S | 5TH ST E/S | 2 | 220 | 33 | 7,260.00 | E | C\&G | 61 |
| MARPLE STREET | 1 | FULTON ST N/S | PACIFIC AVE S/S | 2 | 1,005.00 | 33 | 33,165.00 | E | C\&G | 61 |
| MARPLE STREET | 2 | PACIFIC AVE N/S | MICHIGAN AVE S/S | 2 | 1,515.00 | 33 | 49,995.00 | E | C\&G | 61 |
| OAKWAY DRIVE | 2 | LINCOLN RD S/S (E) | LINCOLN RD N/S (W) | 2 | 1,305.00 | 34 | 44,370.00 | E | CUR | 61 |
| OREGON AVENUE | 1 | SOUTHWEST BL W/S | END | 2 | 1,315.00 | 26 | 34,190.00 | E | C\&G | 61 |
| 7TH STREET | 2 | ANDERSON AVE S/S | DONNELLY AVE N/S | 2 | 765 | 34 | 26,010.00 | E | CUR | 60 |
| 8TH STREET | 6 | TEAKWOOD AVE N/S | END | 2 | 380 | 13 | 4,940.00 | E | NON | 60 |
| ANDERSON AVENUE | 1 | 10TH ST W/S | 11TH ST W/S | 2 | 310 | 33 | 10,230.00 | E | C\&G | 60 |
| FULTON AVENUE | 1 | EMPIRE BL E/S | WASSON ST W/S | 2 | 810 | 32 | 25,920.00 | E | C\&G | 60 |
| GARFIELD AVENUE | 3 | MADISON ST E/S | END | 2 | 490 | 34 | 16,660.00 | E | CUR | 60 |
| HALL AVENUE | 3 | 2ND ST E/S | ALLEY E/S | 2 | 165 | 35 | 5,775.00 | E | CUR | 60 |
| MARPLE STREET | 5 | SCHETTER AVE N/S | JACKSON AVE N/S | 2 | 515 | 35 | 18,025.00 | E | CUR | 60 |
| 12TH COURT | 2 | F ST N/S | E ST S/S | 2 | 425 | 16 | 6,800.00 | E | NON | 59 |
| 14TH STREET | 3 | NUTWOOD AVE S/S | TEAKWOOD AVE S/S | 2 | 1,155.00 | 36 | 41,580.00 | E | CUR | 59 |
| 17TH STREET | 1 | THOMPSON RD N/S | END | 2 | 160 | 50 | 6,800.00 | E | C\&G | 59 |
| 5TH STREET | 11 | DONNELLY AVE N/S | BENNETT AVE S/S | 2 | 510 | 31 | 15,810.00 | E | CUR | 59 |
| BIRCH AVENUE | 3 | 12TH ST W/S | 13TH ST E/S | 2 | 220 | 25 | 5,500.00 | E | CUR | 59 |
| JUNIPER AVENUE | 2 | 19TH ST E/S | COTTONWOOD AVE E/S | 2 | 1,605.00 | 29 | 46,545.00 | E | CUR | 59 |
| MARYLAND AVENUE | 2 | MORRISON ST E/S | SCHONEMAN ST W/S | 2 | 375 | 34 | 12,750.00 | E | CUR | 59 |
| SCHONEMAN STREET | 3 | MICHIGAN AVE S/S | FLANAGAN AVE N/S | 2 | 755 | 33 | 24,915.00 | E | C\&G | 59 |
| WALL STREET | 2 | HARRIS AVE S/S | SCHETTER AVE N/S | 2 | 1,010.00 | 34 | 34,340.00 | E | CUR | 59 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | $\begin{aligned} & \text { Section } \\ & \text { ID } \end{aligned}$ | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH AVENUE | 1 | D ST S/S | E ST N/S | 2 | 435 | 23 | 10,005.00 | E | NON | 58 |
| 4TH STREET | 9 | HIGHLAND AVE N/S | PARK AVE S/S | 2 | 230 | 24 | 5,520.00 | E | CUR | 58 |
| 8TH STREET | 1 | FIR AVE N/S | HEMLOCK AVE S/S | 2 | 695 | 33 | 22,935.00 | E | CUR | 58 |
| ELROD AVENUE | 4 | 7TH ST W/S | 10TH ST W/S | 2 | 900 | 35 | 31,500.00 | C | CUR | 58 |
| MARPLE STREET | 6 | JACKSON AVE N/S | HARRIS AVE S/S | 2 | 495 | 32 | 15,840.00 | E | CUR | 58 |
| WALL STREET | 4 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 465 | 53 | 24,645.00 | E | C\&G | 58 |
| 1ST AVENUE | 2 | D ST N/S | A ST N/S | 2 | 1,315.00 | 30 | 39,450.00 | E | NON | 57 |
| 5TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | 2 | 565 | 38 | 21,470.00 | E | CUR | 57 |
| 7TH COURT | 1 | FIR AVE N/S | END | 2 | 215 | 20 | 4,300.00 | E | NON | 57 |
| BAYVIEW DRIVE | 1 | 16TH AVE E/S | END | 2 | 725 | 20 | 14,500.00 | E | NON | 57 |
| HEMLOCK AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | 2 | 1,285.00 | 24 | 30,840.00 | E | CUR | 57 |
| INGERSOLL AVENUE | 6 | 7TH ST W/S | 10TH ST E/S | 2 | 725 | 25 | 18,125.00 | E | C\&G | 57 |
| INGERSOLL AVENUE | 8 | 11TH ST W/S | END | 2 | 365 | 18 | 6,570.00 | E | NON | 57 |
| MERCHANT STREET | 3 | D ST S/S | FINK ST N/S | 2 | 235 | 23 | 5,405.00 | E | NON | 57 |
| MONTGOMERY AVENUE | 4 | WASSON ST E/S | CAMMANN ST W/S | 2 | 265 | 33 | 8,745.00 | E | C\&G | 57 |
| MORRISON STREET | 1 | LAKESHORE DR S/S | PIRATES CT S/S | 2 | 885 | 34 | 30,090.00 | C | C\&G | 57 |
| 19TH STREET | 2 | OCEAN BL N/S | JUNIPER AVE S/S | 2 | 465 | 28 | 13,020.00 | E | CUR | 56 |
| 2ND STREET | 12 | MARKET AVE N/S | PARK AVE S/S | 2 | 435 | 36 | 15,660.00 | E | C\&G | 56 |
| 8TH AVENUE | 1 | D ST N/S | END | 2 | 175 | 20 | 3,500.00 | E | NON | 56 |
| ARAGO AVENUE | 1 | MORRISON ST E/S | END | 2 | 400 | 33 | 13,200.00 | E | C\&G | 56 |
| BENNETT AVENUE | 2 | 6TH ST W/S | 7TH ST E/S | 2 | 230 | 25 | 5,750.00 | E | CUR | 56 |
| CURTIS AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | 1 | 115 | 33 | 3,795.00 | E | CUR | 56 |
| GOLDEN AVENUE | 2 | 5TH ST E/S | 4TH ST W/S | 2 | 350 | 42 | 14,700.00 | E | CUR | 56 |
| 2ND AVENUE | 02B | D ST N/S | B ST S/S | 2 | 890 | 25 | 22,250.00 | E | NON | 55 |
| 6TH STREET | 5 | IVY AVE N/S | KOOSBAY BL S/S | 2 | 430 | 41 | 17,630.00 | E | C\&G | 55 |
| FINK STREET | 2 | WHITTY ST E/S | 1ST AVE W/S | 2 | 560 | 22 | 12,320.00 | E | NON | 55 |
| MARPLE STREET | 8 | GRANT AVE N/S | TAYLOR AVE N/S | 2 | 475 | 22 | 10,450.00 | E | CUR | 55 |
| UNDERWOOD AVENUE | 1 | 8TH ST W/S | END | 2 | 405 | 13 | 5,265.00 | E | NON | 55 |
| 4TH COURT | 3 | 205' N/O PARK AVE | END | 2 | 715 | 18 | 12,870.00 | E | CUR | 54 |
| 7TH STREET | 7 | INGERSOLL AVE S/S | JOHNSON AVE S/S | 2 | 570 | 33 | 18,810.00 | E | C\&G | 54 |
| EMPIRE BOULEVARD | 2 | NEWMARK AVE N/S | CITY LIMITS | 2 | 4,445.00 | 32 | 142,240.00 | A | NON | 54 |
| EVERGREEN DRIVE | 2 | 17TH AVE W/S | 16TH AVE E/S | 2 | 200 | 24 | 4,800.00 | E | NON | 54 |
| HARBORVIEW COURT | 1 | HARBORVIEW DR W/S | END | 2 | 180 | 16 | 2,880.00 | E | NON | 54 |
| MERCHANT STREET | 2 | JACKSON ST S/S | D ST N/S | 2 | 230 | 22 | 5,060.00 | E | NON | 54 |
| MORRISON STREET | 9 | WEBSTER AVE S/S | BLANCO AVE S/S | 2 | 260 | 33 | 8,580.00 | E | C\&G | 54 |
| WASSON STREET | 1 | HARRIS AVE S/S | TAYLOR AVE N/S | 2 | 1,060.00 | 34 | 36,040.00 | C | C\&G | 54 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH STREET | 7 | JOHNSON AVE N/S | SOUTHWEST BL N/S | 2 | 1,525.00 | 22 | 33,550.00 | A | CUR | 53 |
| 10TH STREET | 9 | INGERSOLL AVE S/S | JOHNSON AVE N/S | 2 | 560 | 22 | 12,320.00 | A | CUR | 53 |
| 20TH STREET | 2 | WOODLAND DR N/S | JUNIPER AVE S/S | 2 | 380 | 35 | 13,300.00 | E | CUR | 53 |
| ADLER AVENUE | 1 | 12TH ST W/S | 13TH ST W/S | 2 | 320 | 25 | 8,000.00 | E | CUR | 53 |
| F STREET | 2 | 9TH AVE W/S | 10TH AVE W/S | 2 | 250 | 26 | 6,500.00 | E | C\&G | 53 |
| JUNIPER AVENUE | 1 | 20TH ST E/S | 19TH ST W/S | 2 | 330 | 34 | 11,220.00 | E | CUR | 53 |
| MORRISON STREET | 5 | SALMON AVE N/S | MICHIGAN AVE N/S | 2 | 295 | 37 | 10,915.00 | C | CUR | 53 |
| PENNSYLVANIA AVENUE | 2 | 17TH ST W/S | 19TH ST W/S | 2 | 640 | 26 | 16,640.00 | E | NON | 53 |
| 2ND STREET | 2 | KRUSE AVE N/S | JOHNSON AVE S/S | 2 | 535 | 39 | 20,865.00 | E | CUR | 52 |
| 2ND STREET | 5 | GOLDEN AVE N/S | ELROD AVE S/S | 2 | 525 | 55 | 28,875.00 | E | CUR | 52 |
| 5TH STREET | 1 | HIGHLAND AVE N/S | MARKET AVE N/S | 2 | 210 | 33 | 6,930.00 | E | C\&G | 52 |
| 7TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | 2 | 565 | 33 | 18,645.00 | A | C\&G | 52 |
| 8TH STREET | 5 | PINE AVE S/S | REDWOOD AVE N/S | 2 | 355 | 32 | 11,360.00 | E | CUR | 52 |
| CEDAR AVENUE | 1 | 10TH ST W/S | END | 2 | 335 | 23 | 7,705.00 | E | NON | 52 |
| TRICIA PLACE | 1 | KENTUCKY AVE N/S | CDS | 2 | 235 | 33 | 8,655.00 | E | C\&G | 52 |
| 4TH COURT | 1 | HIGHLAND AVE N/S | PARK AVE S/S | 2 | 235 | 18 | 4,230.00 | E | CUR | 51 |
| 8TH AVENUE | 3 | E ST S/S | F ST N/S | 2 | 420 | 25 | 10,500.00 | E | NON | 51 |
| 8TH STREET | 16 | CENTRAL AVE N/S | COMMERCIAL AVE S/S | 2 | 320 | 26 | 8,320.00 | E | CUR | 51 |
| NORMAN AVENUE | 2 | NEWMARK AVE S/S | OCEAN BL N/S | 2 | 1,165.00 | 33 | 38,445.00 | E | C\&G | 51 |
| SIGNAL WAY | 1 | DATE AVE S/S | TELEGRAPH DR E/S | 2 | 720 | 35 | 25,200.00 | E | CUR | 51 |
| 11TH AVENUE | 2 | F ST N/S | E ST S/S | 2 | 435 | 24 | 10,440.00 | E | NON | 50 |
| 11TH STREET | 4 | INGERSOLL AVE S/S | END | 2 | 350 | 16 | 5,600.00 | E | NON | 50 |
| 12TH STREET | 3 | YEW AVE N/S | CITY LIMITS | 2 | 200 | 30 | 6,000.00 | E | NON | 50 |
| 2ND STREET | 3 | JOHNSON AVE N/S | HALL AVE S/S | 2 | 1,110.00 | 38 | 42,180.00 | E | CUR | 50 |
| FLANAGAN AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | 2 | 465 | 34 | 15,810.00 | E | C\&G | 50 |
| IDAHO AVENUE | 1 | SOUTHWEST BL W/S | END | 2 | 1,130.00 | 25 | 28,250.00 | E | C\&G | 50 |
| WEST HILLS BOULEVARD | 1 | OCEAN BL S/S | LINCOLN BL W/S | 2 | 485 | 33 | 16,005.00 | E | C\&G | 50 |
| 8TH STREET | 3 | KOOSBAY BL N/S | END | 2 | 680 | 33 | 22,440.00 | E | CUR | 49 |
| 8TH STREET | 12 | 8TH TERR N/S | 7TH TERR S/S | 2 | 250 | 26 | 6,500.00 | E | CUR | 49 |
| CAMMANN STREET | 6 | SHETTER AVE N/S | NEWMARK AVE N/S | 2 | 495 | 53 | 26,235.00 | E | C\&G | 49 |
| MARKET AVENUE | 2 | BROADWAY W/S | 4TH ST W/S | 2 | 785 | 39 | 30,615.00 | E | C\&G | 49 |
| NEWMARK AVENUE | 4 | EMPIRE BL W/S | MILL ST W/S | 2 | 270 | 21 | 5,670.00 | E | NON | 49 |
| 4TH AVENUE | 2 | D ST N/S | END | 2 | 495 | 25 | 12,375.00 | E | NON | 48 |
| MICHIGAN AVENUE | 3 | MARPLE ST E/S | CAMMANN ST W/S | 2 | 835 | 53 | 44,255.00 | E | C\&G | 48 |
| PARK AVENUE | 4 | 14TH ST E/S | CEDAR AVE S/S | 2 | 1,555.00 | 20 | 31,100.00 | E | NON | 48 |
| REDWOOD AVENUE | 1 | 8TH ST W/S | 11TH ST E/S | 2 | 520 | 22 | 11,440.00 | E | CUR | 48 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | $\begin{aligned} & \text { Section } \\ & \text { ID } \end{aligned}$ | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SEABREEZE TERRACE | 1 | TIDEVIEW TERRACE S/S | LAKESHORE DR N/S | 2 | 305 | 26 | 7,930.00 | E | C\&G | 48 |
| 7TH STREET | 12 | PINE AVE S/S | END | 2 | 460 | 37 | 17,020.00 | E | CUR | 47 |
| ANDERSON AVENUE | 2 | 11T ST W/S | END | 2 | 1,550.00 | 23 | 35,650.00 | E | NON | 47 |
| CAMMANN STREET | 9 | MONTGOMERY AVE N/S | PACIFIC AVE N/S | 2 | 515 | 33 | 16,995.00 | E | C\&G | 47 |
| CURTIS AVENUE | 2 | BROADWAY ST W/S | 4TH ST E/S | 2 | 705 | 32 | 22,560.00 | E | C\&G | 47 |
| SOUTHWEST BOULEVARD | 3 | MONTANA AVE S/S | WASHINGTON AVE S/S | 2 | 1,435.00 | 40 | 57,400.00 | A | C\&G | 47 |
| 5TH STREET | 6 | HALL AVE S/S | INGERSOLL AVE N/S | 2 | 545 | 28 | 15,260.00 | E | CUR | 46 |
| 7TH AVENUE | 1 | F ST N/S | E ST S/S | 2 | 415 | 22 | 9,130.00 | E | NON | 46 |
| H STREET | 1 | 6TH AVE E/S | 9TH AVE W/S | 2 | 810 | 26 | 21,060.00 | E | NON | 46 |
| HALL AVENUE | 2 | 4TH ST E/S | 2ND ST W/S | 2 | 325 | 31 | 10,075.00 | E | CUR | 46 |
| KINGWOOD AVENUE | 1 | 7TH ST E/S | BAYSHORE DR W/S | 2 | 455 | 38 | 17,290.00 | E | CUR | 46 |
| WASHINGTON AVENUE | 1 | SOUTHWEST BL W/S | END | 2 | 1,220.00 | 25 | 30,500.00 | E | C\&G | 46 |
| 11TH STREET | 7 | 100' N/O COMMERCIAL AVE | PARK AVE N/S | 2 | 515 | 24 | 12,360.00 | E | CUR | 45 |
| 6TH STREET | 1 | COMMERCIAL AVE S/S | ANDERSON AVE N/S | 2 | 480 | 38 | 18,240.00 | E | C\&G | 45 |
| 9TH STREET | 1 | FIR AVE N/S | DATE AVE N/S | 2 | 500 | 26 | 13,000.00 | E | CUR | 45 |
| KOOSBAY BOULEVARD | 3 | TEAKWOOD AVE S/S | CITY LIMITS | 2 | 1,565.00 | 40 | 62,600.00 | A | C\&G | 45 |
| TELEGRAPH DRIVE | 2 | PARK AVE E/S | DATE AVE (W) S/S | 2 | 1,025.00 | 35 | 35,875.00 | E | CUR | 45 |
| WALLACE STREET | 2 | OCEAN BL S/S | END | 2 | 485 | 33 | 16,005.00 | E | C\&G | 45 |
| WASSON STREET | 6 | NOBLE AVE N/S | PACIFIC AVE N/S | 2 | 1,040.00 | 34 | 35,360.00 | E | C\&G | 45 |
| WASSON STREET | 7 | PACIFIC AVE S/S | END | 2 | 1,500.00 | 33 | 49,500.00 | E | C\&G | 45 |
| 2ND STREET | 4 | HALL AVE S/S | GOLDEN AVE S/S | 2 | 525 | 54 | 28,350.00 | E | CUR | 44 |
| BRULE STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | 2 | 415 | 33 | 13,695.00 | E | C\&G | 44 |
| CENTRAL AVENUE | 2 | 12TH ST E/S | 10TH ST W/S | 3 | 595 | 41 | 24,395.00 | A | CUR | 44 |
| E STREET | 2 | 6TH AVE E/S | 9TH ST W/S | 2 | 875 | 21 | 18,375.00 | E | NON | 44 |
| FLANAGAN AVENUE |  | MORRISON ST E/S | END | 2 | 460 | 34 | 15,640.00 | E | C\&G | 44 |
| HALL AVENUE | 1 | 7TH ST E/S | 4TH ST W/S | 2 | 715 | 29 | 20,735.00 | E | CUR | 44 |
| 12TH STREET | 4 | PARK AVE N/S | BIRCH AVE N/S | 2 | 555 | 24 | 13,320.00 | E | CUR | 43 |
| 12TH STREET | 6 | COMMERCIAL AVE N/S | 12TH TER N/S | 2 | 325 | 45 | 12,125.00 | E | CUR | 43 |
| 18TH AVENUE | 1 | FILBERT AVE S/S | END | 2 | 250 | 23 | 5,750.00 | E | NON | 43 |
| 2ND STREET | 1 | LOCKHART AVE N/S | KRUSE AVE S/S | 2 | 535 | 36 | 19,260.00 | E | C\&G | 43 |
| 10TH COURT | , | DATE AVE N/S | END | 2 | 560 | 23 | 12,880.00 | E | NON | 42 |
| 9TH STREET | 04E | ANDERSON AVE S/S | END | 2 | 330 | 35 | 11,550.00 | E | CUR | 42 |
| HARBORVIEW DRIVE | 1 | D ST S/S | END | 2 | 475 | 16 | 7,600.00 | E | NON | 42 |
| JUNIPER AVENUE | 6 | 13TH ST E/S | END | 2 | 440 | 29 | 12,760.00 | E | CUR | 42 |
| CANYON DRIVE | 1 | 9TH AVE E/S | SHONSTA WY N/S | 2 | 370 | 21 | 7,770.00 | E | CUR | 41 |
| 11TH STREET | 2 | FERGUSON AVE N/S | ELROD AVE S/S | 2 | 230 | 35 | 8,050.00 | E | CUR | 40 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCl |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MORRISON STREET | 4 | NEWMARK AVE S/S | SALMON AVE N/S | 2 | 250 | 38 | 9,500.00 | C | C\&G | 40 |
| MICHIGAN AVENUE | 1 | MILL ST E/S | EMPIRE BL W/S | 2 | 235 | 16 | 3,760.00 | E | NON | 39 |
| NUTWOOD AVENUE | 1 | 14TH ST W/S | 15TH ST E/S | 2 | 220 | 20 | 4,400.00 | E | NON | 39 |
| TELEGRAPH DRIVE | 1 | DATE AVE (E) S/S | PARK AVE E/S | 2 | 1,080.00 | 35 | 37,800.00 | E | CUR | 38 |
| 2ND AVENUE | 1 | D ST S/S | E ST N/S | 2 | 330 | 33 | 10,890.00 | E | NON | 37 |
| 2ND COURT | 1 | 2ND ST W/S | 4TH ST W/S | 2 | 475 | 25 | 11,875.00 | E | CUR | 37 |
| FERGUSON AVENUE | 4 | 11TH ST W/S | 12TH CT E/S | 2 | 225 | 25 | 5,625.00 | E | CUR | 37 |
| JUNIPER AVENUE | 4 | BUTLER RD W/S | 14TH ST W/S | 2 | 435 | 33 | 14,355.00 | E | CUR | 37 |
| KENTUCKY AVENUE | 4 | 125' W/O TRICIA PL | PREFONTAINE DR W/S | 2 | 705 | 33 | 23,265.00 | E | C\&G | 37 |
| LINCOLN BOULEVARD | 1 | WEST HILLS BL S/S | OAKWAY DR E/S | 2 | 635 | 35 | 22,225.00 | E | C\&G | 37 |
| 12TH STREET | 2 | ELROD ST S/S | END | 2 | 525 | 18 | 9,450.00 | E | CUR | 36 |
| F STREET | 4 | 12TH AVE E/S | 12TH CT W/S | 2 | 125 | 25 | 3,125.00 | E | C\&G | 36 |
| FIR AVENUE | 1 | 9TH ST E/S | 8TH ST W/S | 2 | 245 | 23 | 5,635.00 | E | CUR | 36 |
| INGERSOLL AVENUE | 3 | 2ND ST W/S | 4TH ST E/S | 2 | 335 | 38 | 12,730.00 | E | CUR | 36 |
| JOHNSON AVENUE | 1 | BROADWAY ST W/S | 4TH ST E/S | 2 | 720 | 39 | 28,080.00 | C | CUR | 36 |
| 14TH STREET | 2 | MYRTLE AVE S/S | NUTWOOD AVE S/S | 2 | 375 | 36 | 13,500.00 | E | CUR | 35 |
| I STREET | 1 | 14TH AVE E/S | 17TH AVE E/S | 2 | 720 | 22 | 15,840.00 | E | NON | 35 |
| JACKSON STREET | 1 | 1ST AVE W/S | MERCHANT ST W/S | 2 | 345 | 26 | 8,970.00 | E | NON | 35 |
| PACIFIC AVENUE | 3 | MORRISON ST E/S | END | 2 | 1,510.00 | 33 | 49,830.00 | E | CUR | 35 |
| BUTLER ROAD | 1 | OCEAN BL N/S | JUNIPER AVE S/S | 2 | 710 | 35 | 24,850.00 | E | CUR | 34 |
| CEDAR AVENUE | 2 | PARK AVE S/S | BIRCH AVE N/S | 2 | 590 | 18 | 10,620.00 | E | NON | 34 |
| D STREET | 3 | 5TH AVE W/S | 2ND AVE W/S | 2 | 910 | 41 | 37,310.00 | C | NON | 34 |
| DATE AVENUE | 3 | TELEGRAPH DR E/S | 3RD CT E/S | 2 | 135 | 34 | 4,590.00 | E | CUR | 34 |
| 2ND STREET | 6 | ELROD AVE N/S | CURTIS AVE S/S | 2 | 520 | 36 | 18,720.00 | E | CUR | 33 |
| 4TH STREET | 8 | MARKET AVE N/S | HIGHLAND AVE S/S | 2 | 180 | 26 | 4,680.00 | E | CUR | 33 |
| BLANCO AVENUE | 1 | MORRISON ST E/S | FULTON AVE N/S | 2 | 640 | 33 | 21,120.00 | E | C\&G | 33 |
| SCHONEMAN STREET | 1 | HARRIS AVE S/S | NEWMARK AVE N/S | 2 | 1,135.00 | 35 | 39,725.00 | C | C\&G | 33 |
| WASSON STREET | 5 | MICHIGAN AVE S/S | NOBLE AVE N/S | 2 | 475 | 34 | 16,150.00 | E | C\&G | 33 |
| 5TH STREET | 7 | INGERSOLL AVE N/S | JOHNSON AVE N/S | 2 | 570 | 27 | 15,390.00 | E | CUR | 32 |
| COMMERCIAL AVENUE | 7 | 12TH ST W/S | 14TH ST E/S | 2 | 660 | 16 | 10,560.00 | A | CUR | 32 |
| WASSON STREET | 4 | NEWMARK AVE S/S | MICHIGAN AVE N/S | 2 | 465 | 52 | 24,180.00 | E | C\&G | 32 |
| MINNESOTA AVENUE | 1 | SOUTHWEST BL N/S | 14TH ST W/S | 2 | 915 | 34 | 31,110.00 | E | C\&G | 31 |
| E STREET | 1 | 2ND AV W/S | 6TH ST W/S | 2 | 1,230.00 | 23 | 28,290.00 | E | NON | 30 |
| KINNEY ROAD | 1 | THOMPSON RD N/S | CITY LIMITS | 2 | 235 | 28 | 6,580.00 | E | NON | 30 |
| MORRISON STREET | 7 | MONTGOMERY AVE S/S | PACIFIC AVE N/S | 2 | 485 | 33 | 16,005.00 | C | C\&G | 30 |
| MORRISON STREET | 8 | PACIFIC AVE N/S | WEBSTER AVE S/S | 2 | 555 | 33 | 18,315.00 | E | C\&G | 30 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCl |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INGERSOLL AVENUE | 2 | BROADWAY AVE W/S | 2ND ST E/S | 2 | 325 | 38 | 12,350.00 | E | AB | 29 |
| 2ND AVENUE | 02A | D ST N/S | B ST S/S | 2 | 890 | 25 | 22,250.00 | E | CUR | 28 |
| INGERSOLL AVENUE | 4 | 4TH ST W/S | 5TH ST E/S | 2 | 345 | 28 | 9,660.00 | E | CUR | 28 |
| FULTON AVENUE | 6 | 390' E/O MORRISON ST | PREFONTAINE DR W/S | 2 | 755 | 33 | 24,915.00 | E | C\&G | 27 |
| PARK AVENUE | 5 | 11TH ST W/S | END | 2 | 550 | 23 | 12,650.00 | E | CUR | 27 |
| E STREET | 4 | 11TH ST E/S | 14TH AVE W/S | 2 | 810 | 18 | 14,580.00 | E | NON | 26 |
| LA CLAIR STREET | 1 | OCEAN BL N/S | NEWMARK AVE S/S | 2 | 1,555.00 | 34 | 55,270.00 | E | C\&G | 26 |
| 10TH STREET | 8 | ELROD AVE S/S | END | 2 | 675 | 22 | 14,850.00 | E | CUR | 25 |
| 2ND AVENUE | 03A | B ST S/S | A ST S/S | 2 | 470 | 16 | 7,520.00 | E | NON | 25 |
| 3RD STREET | 1 | BIRCH AVE N/S | PARK AVE N/S | 2 | 510 | 17 | 8,670.00 | E | CUR | 25 |
| 8TH STREET | 7 | FERGUSON AVE N/S | ELROD AVE S/S | 2 | 230 | 26 | 5,980.00 | E | CUR | 25 |
| 8TH STREET | 8 | ELROD AVE N/S | DONNELLY AVE S/S | 2 | 225 | 26 | 5,850.00 | E | CUR | 25 |
| 8TH STREET | 10 | JOHNSON AVE N/S | INGERSOLL AVE S/S | 2 | 525 | 29 | 15,225.00 | E | CUR | 25 |
| 9TH STREET | 5 | DONNELLY AVE S/S | ELROD AVE N/S | 2 | 230 | 18 | 4,140.00 | E | CUR | 25 |
| 9TH STREET | 6 | ELROD AVE S/S | END | 2 | 615 | 25 | 15,375.00 | E | CUR | 25 |
| A STREET | 1 | 1ST AVE E/S | 2ND AVE E/S | 2 | 275 | 22 | 6,050.00 | E | CUR | 25 |
| CAMMANN STREET | 2 | TAYLOR AVE N/S | GRANT AVE S/S | 2 | 545 | 36 | 19,620.00 | E | CUR | 25 |
| FERGUSON AVENUE | 1 | 7TH ST W/S | 9TH ST E/S | 2 | 490 | 25 | 12,250.00 | E | CUR | 25 |
| MARKET AVENUE | 4 | 5TH ST W/S | END | 2 | 180 | 25 | 4,500.00 | E | CUR | 25 |
| MICHIGAN AVENUE | 2 | EMPIRE BL E/S | MARPLE ST E/S | 2 | 290 | 53 | 15,370.00 | E | C\&G | 25 |
| PREFONTAINE DRIVE | 1 | NAUTICAL LN N/S | FULTON AVE S/S | 2 | 1,115.00 | 33 | 36,795.00 | E | C\&G | 25 |
| 8TH STREET | 2 | HEMLOCK AVE S/S | KOOSBAY BL S/S | 2 | 590 | 25 | 14,750.00 | E | CUR | 24 |
| CAMMANN STREET | 3 | GRANT AVE S/S | HARRIS AVE N/S | 2 | 495 | 34 | 16,830.00 | E | CUR | 24 |
| CAMMANN STREET | 4 | HARRIS AVE N/S | JACKSON AVE N/S | 2 | 525 | 34 | 17,850.00 | E | CUR | 24 |
| E STREET | 3 | 9TH ST W/S | 11TH ST E/S | 2 | 565 | 23 | 12,995.00 | E | NON | 24 |
| MICHIGAN AVENUE | 5 | MADISON ST E/S | MORRISON ST W/S | 2 | 460 | 37 | 17,020.00 | E | CUR | 24 |
| RADAR ROAD | 1 | FULTON AVE N/S | OCEAN BL S/S | 2 | 2,195.00 | 35 | 76,825.00 | E | C\&G | 24 |
| FERGUSON AVENUE | 3 | 10TH ST W/S | 11TH ST E/S | 2 | 230 | 26 | 5,980.00 | E | CUR | 23 |
| FULTON AVENUE | 7 | PREFONTAINE DR W/S | RADAR RD E/S | 2 | 395 | 33 | 13,035.00 | E | C\&G | 23 |
| YEW AVENUE | 2 | KOOSBAY BL E/S | END | 2 | 690 | 25 | 17,250.00 | E | NON | 23 |
| CAMMANN STREET | 5 | JACKSON AVE N/S | SHETTER AVE N/S | 2 | 515 | 34 | 17,510.00 | E | CUR | 22 |
| DAKOTA AVENUE | 1 | SOUTHWEST BL | END | 2 | 205 | 27 | 5,535.00 | E | C\&G | 21 |
| INGERSOLL AVENUE | 5 | 5TH ST W/S | 7TH ST E/S | 2 | 345 | 31 | 10,695.00 | E | CUR | 21 |
| 14TH STREET | 4 | JUNIPER AVE S/S | PARK AVE N/S | 2 | 675 | 30 | 20,250.00 | E | CUR | 20 |
| 5TH STREET | 8 | JOHNSON AVE S/S | KRUSE AVE N/S | 2 | 545 | 24 | 13,080.00 | E | NON | 20 |
| PARK AVENUE | 1 | TELEGRAPH DR S/S | 4TH CT W/S | 2 | 485 | 35 | 16,975.00 | E | CUR | 20 |

City of Coos Bay
PCI Report 2015
Descending PCI Rating

| Name | Section ID | From | To | Lanes | Length | Width | True Area | Rank | Shoulder | PCI |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 8TH STREET | 15 | ANDERSON AVE N/S | CENTRAL AVE S/S | 2 | 320 | 25 | 8,000.00 | E | CUR | 19 |
| 5TH STREET | 10 | FIR AVE N/S | END | 2 | 115 | 20 | 2,300.00 | E | NON | 17 |
| WHITTY STREET | 1 | D ST S/S | END | 2 | 475 | 31 | 14,725.00 | E | CUR | 17 |
| KRUSE AVENUE | 2 | 5TH ST W/S | 7TH ST E/S | 2 | 345 | 37 | 12,765.00 | E | C\&G | 16 |
| 11TH STREET | 5 | CENTRAL AVE N/S | 100' N/O CENTRAL | 2 | 100 | 26 | 2,600.00 | E | CUR | 15 |
| 7TH STREET | 1 | KOOSBAY BL N/S | KINGWOOD AVE N/S | 2 | 325 | 38 | 12,350.00 | E | C\&G | 15 |
| YEW AVENUE | 1 | KOOSBAY BL E/S | END | 2 | 210 | 32 | 6,720.00 | E | NON | 15 |
| DONNELLY AVENUE | 2 | 6TH ST W/S | 7TH ST E/S | 2 | 230 | 26 | 5,980.00 | E | CUR | 14 |
| DONNELLY AVENUE | 3 | 7TH ST W/S | 9TH ST W/S | 2 | 510 | 25 | 12,750.00 | E | CUR | 14 |
| FERGUSON AVENUE | 2 | 9TH ST W/S | 10TH ST E/S | 2 | 235 | 25 | 5,875.00 | E | CUR | 14 |
| 2ND STREET | 8 | PARK AVE N/S | ALDER AVE S/S | 2 | 255 | 26 | 6,630.00 | E | CUR | 13 |
| 5TH STREET | 5 | GOLDEN AVE S/S | HALL AVE N/S | 2 | 540 | 26 | 14,040.00 | E | CUR | 13 |
| PENNSYLVANIA AVENUE | 1 | SOUTHWEST BL W/S | 17TH ST W/S | 2 | 900 | 36 | 32,400.00 | E | C\&G | 10 |
| MONTGOMERY AVENUE | 6 | MORRISON ST E/S | END | 2 | 370 | 32 | 11,840.00 | E | C\&G | 7 |
| 9TH STREET | 3 | CENTRAL AVE S/S | ANDERSON AVE N/S | 2 | 325 | 35 | 11,375.00 | E | CUR | 6 |
| 7TH TERRACE | 1 | 8TH ST E/S | END | 2 | 120 | 15 | 1,800.00 | E | C\&G | 0 |

353,940 11,557,160

## Total Length

 Total Area
## Total Centerline Miles

Average PCI

353,940 LF
11,557,150 SF
67.0 Miles
64.3 PCI

## SECTION V <br> PROJECTED WORK PROGRAMS

## PROJECTED WORK PROGRAMS

In developing an annual expenditure level required to maintain the street network at its current average PCI level, three (3) budget scenarios were studied. The budget scenarios should be utilized in conjunction with each other by City staff to consider possible plans for the maintenance strategies within the City. The City of Coos Bay has a Fair PCI rating citywide of 64.3 . The budget scenarios are as follows:

UNLIMITED BUDGET - Unlimited Budget scenario is the amount of money necessary to complete all of the maintenance required each year for the entire roadway network. The City of Coos Bay's backlog of maintenance is approximately $\$ 19.6$ million.

5 YEAR SLURRY SEAL BUDGET - 5 YEAR SLURRY SEAL Budget scenario is the amount of money recommended for the Slurry Seal maintenance required each year for the entire roadway network. The recommended slurry seal budget for the City of Coos Bay is approximately $\$ 250,000$.

RECOMMENDED BUDGET -Recommended Budget scenario is the city staff budget of $\$ 750 \mathrm{~K}$ a year for five years for a total budget of $\$ 3.75$ Million. Maintenances include thin overlay, overlay, reconstruction, and slurry seals.

## City of Coos Bay <br> Unlimited Budget <br> $\underline{2015}$

| Name | Section <br> ID <br> From |  | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH AVENUE | 1 | D ST S/S | E ST N/S | \$23,518.92 | 57.44 | 100 | Major Below Critical | 2015 |
| 10TH AVENUE | 2 | E ST S/S | F ST N/S | \$5,994.33 | 64.54 | 73.73 | Global MR | 2015 |
| 10TH COURT | 1 | DATE AVE N/S | END | \$43,405.62 | 41.2 | 100 | Major Below Critical | 2015 |
| 10TH COURT | 2 | HEMLOCK AVE N/S | END | \$1,780.81 | 75.67 | 83.55 | Global MR | 2015 |
| 10TH STREET | 1 | ELROD AVE N/S | CENTRAL AVE S/S | \$23,836.87 | 72.56 | 80.8 | Global MR | 2015 |
| 10TH STREET | 7 | JOHNSON AVE N/S | SOUTHWEST BL N/S | \$102,767.83 | 52.24 | 100 | Major Below Critical | 2015 |
| 10TH STREET | 8 | ELROD AVE S/S | END | \$120,044.99 | 23.96 | 100 | Major Below Critical | 2015 |
| 10TH STREET | 9 | INGERSOLL AVE S/S | JOHNSON AVE N/S | \$37,552.05 | 52.35 | 100 | Major Below Critical | 2015 |
| 11TH AVENUE | 2 | F ST N/S | E ST S/S | \$35,182.82 | 49.34 | 100 | Major Below Critical | 2015 |
| 11TH STREET | 2 | FERGUSON AVE N/S | ELROD AVE S/S | \$29,884.94 | 39.03 | 100 | Major Below Critical | 2015 |
| 11TH STREET | 3 | SPRUCE AVE N/S | END SOUTH | \$3,100.51 | 74.6 | 82.6 | Global MR | 2015 |
| 11TH STREET | 4 | INGERSOLL AVE S/S | END | \$18,872.01 | 49.3 | 100 | Major Below Critical | 2015 |
| 11TH STREET | 5 | CENTRAL AVE N/S | 100' N/O CENTRAL | \$23,035.99 | 13.89 | 100 | Major Below Critical | 2015 |
| 11TH STREET | 7 | 100' N/O COMMERCIAL AVE | PARK AVE N/S | \$41,653.22 | 44.28 | 100 | Major Below Critical | 2015 |
| 12TH AVENUE | 2 | F ST N/S | E ST S/S | \$11,400.49 | 64.54 | 100 | Major Above Critical | 2015 |
| 12TH COURT | 1 | FERGUSON AVE N/S | END | \$4,507.67 | 60.46 | 70.13 | Global MR | 2015 |
| 12TH COURT | 2 | F ST N/S | E ST S/S | \$15,034.67 | 58.46 | 100 | Major Below Critical | 2015 |
| 12TH STREET | 1 | INGERSOLL AVE N/S | END | \$3,175.19 | 67.48 | 100 | Major Above Critical | 2015 |
| 12TH STREET | 2 | ELROD ST S/S | END | \$48,158.79 | 35.11 | 100 | Major Below Critical | 2015 |
| 12TH STREET | 3 | YEW AVE N/S | CITY LIMITS | \$20,220.01 | 49.31 | 100 | Major Below Critical | 2015 |
| 12TH STREET | 4 | PARK AVE N/S | BIRCH AVE N/S | \$44,888.43 | 42.26 | 100 | Major Below Critical | 2015 |
| 12TH STREET | 6 | COMMERCIAL AVE N/S | 12TH TER N/S | \$40,861.27 | 42.26 | 100 | Major Below Critical | 2015 |
| 13TH AVENUE | 1 | D ST S/S | END | \$3,657.02 | 67.57 | 76.41 | Global MR | 2015 |
| 13TH COURT | 2 | F ST N/S | END | \$2,909.71 | 78.72 | 86.24 | Global MR | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| 13TH STREET | 1 | JUNIPER AVE S/S | HEMLOCK AVE S/S | \$12,098.59 | 64.44 | 100 | Major Above Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 13TH STREET | 3 | HIGHLAND AVE S/S | COMMERCIAL AVE N/S | \$3,373.47 | 74.67 | 82.67 | Global MR | 2015 |
| 14TH COURT | 1 | D ST N/S | END | \$1,378.01 | 74.67 | 82.66 | Global MR | 2015 |
| 14TH STREET | 1 | JUNIPER AVE N/S | MYRTLE AVE S/S | \$14,707.57 | 73.64 | 81.76 | Global MR | 2015 |
| 14TH STREET | 2 | MYRTLE AVE S/S | NUTWOOD AVE S/S | \$73,611.48 | 34.1 | 100 | Major Below Critical | 2015 |
| 14TH STREET | 3 | NUTWOOD AVE S/S | TEAKWOOD AVE S/S | \$92,103.33 | 58.43 | 100 | Major Below Critical | 2015 |
| 14TH STREET | 4 | JUNIPER AVE S/S | PARK AVE N/S | \$179,414.92 | 18.93 | 100 | Major Below Critical | 2015 |
| 15TH COURT | 1 | THOMPSON RD N/S | END | \$25,280.95 | 60.46 | 100 | Major Above Critical | 2015 |
| 15TH STREET | 1 | THOMPSON RD N/S | END | \$8,872.24 | 77.7 | 85.33 | Global MR | 2015 |
| 15TH STREET | 2 | MYRTLE AVE N/S | END | \$5,257.63 | 67.56 | 76.4 | Global MR | 2015 |
| 15TH STREET | 3 | MYRTLE AVE S/S | END | \$7,208.03 | 60.46 | 70.14 | Global MR | 2015 |
| 16TH COURT | 1 | THOMPSON RD N/S | END | \$397.50 | 73.64 | 81.76 | Global MR | 2015 |
| 17TH STREET | 1 | THOMPSON RD N/S | END | \$15,062.59 | 58.43 | 100 | Major Below Critical | 2015 |
| 17TH STREET | 2 | MYRTLE AVE S/S | KINGWOOD AVE N/S | \$7,420.04 | 77.7 | 85.33 | Global MR | 2015 |
| 17TH STREET | 3 | I ST N/S | EVERGREEN ST N/S | \$36,352.73 | 63.52 | 100 | Major Above Critical | 2015 |
| 18TH AVENUE | 1 | FILBERT AVE S/S | END | \$19,377.51 | 42.24 | 100 | Major Below Critical | 2015 |
| 19TH STREET | 1 | CALIFORNIA AVE S/S | END | \$11,543.46 | 61.38 | 70.94 | Global MR | 2015 |
| 19TH STREET | 2 | OCEAN BL N/S | JUNIPER AVE S/S | \$34,423.57 | 55.3 | 100 | Major Below Critical | 2015 |
| 19TH STREET | 3 | JUNIPER AVE S/S | COTTONWOOD AVE S/S | \$4,303.62 | 68.5 | 77.22 | Global MR | 2015 |
| 19TH STREET | 4 | THOMPSON RD S/S | END | \$11,368.55 | 72.63 | 80.87 | Global MR | 2015 |
| 1ST AVENUE | 2 | D ST N/S | A ST N/S | \$98,140.57 | 56.44 | 100 | Major Below Critical | 2015 |
| 1STCOURT | 1 | A ST S/S | END | \$930.15 | 62.52 | 71.95 | Global MR | 2015 |
| 20TH STREET | 2 | WOODLAND DR N/S | JUNIPER AVE S/S | \$40,539.14 | 52.35 | 100 | Major Below Critical | 2015 |
| 2ND AVENUE | 1 | D ST S/S | E ST N/S | \$51,384.05 | 36.18 | 100 | Major Below Critical | 2015 |
| 2ND AVENUE | 02A | D ST N/S | B ST S/S | \$166,346.39 | 27.06 | 100 | Major Below Critical | 2015 |
| 2ND AVENUE | 02B | D ST N/S | B ST S/S | \$61,539.83 | 54.41 | 100 | Major Below Critical | 2015 |
| 2ND AVENUE | 03A | B ST S/S | A ST S/S | \$60,702.01 | 24.02 | 100 | Major Below Critical | 2015 |
| 2ND COURT | 1 | 2ND ST W/S | 4TH ST W/S | \$56,828.15 | 35.99 | 100 | Major Below Critical | 2015 |
| 2ND STREET | 1 | LOCKHART AVE N/S | KRUSE AVE S/S | \$64,906.24 | 42.08 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| 2ND STREET | 2 | KRUSE AVE N/S | JOHNSON AVE S/S | \$66,798.99 | 51.23 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2ND STREET | 3 | JOHNSON AVE N/S | HALL AVE S/S | \$142,146.68 | 49.2 | 100 | Major Below Critical | 2015 |
| 2ND STREET | 4 | HALL AVE S/S | GOLDEN AVE S/S | \$95,539.55 | 43.1 | 100 | Major Below Critical | 2015 |
| 2ND STREET | 5 | GOLDEN AVE N/S | ELROD AVE S/S | \$92,442.88 | 51.23 | 100 | Major Below Critical | 2015 |
| 2ND STREET | 6 | ELROD AVE N/S | CURTIS AVE S/S | \$116,480.45 | 31.92 | 100 | Major Below Critical | 2015 |
| 2ND STREET | 7 | CURTIS AVE N/S | ANDERSON AVE S/S | \$11,379.16 | 77.65 | 85.28 | Global MR | 2015 |
| 2ND STREET | 8 | PARK AVE N/S | ALDER AVE S/S | \$58,741.77 | 11.61 | 100 | Major Below Critical | 2015 |
| 2ND STREET | 10 | CENTRAL AVE N/S | COMMERCIAL AVE S/S | \$3,498.02 | 74.67 | 82.67 | Global MR | 2015 |
| 2ND STREET | 11 | COMMERCIAL AVE N/S | MARKET AVE S/S | \$4,671.97 | 74.67 | 82.67 | Global MR | 2015 |
| 2ND STREET | 12 | MARKET AVE N/S | PARK AVE S/S | \$41,124.57 | 55.43 | 100 | Major Below Critical | 2015 |
| 34TH STREET | 1 | LINDBERG AVE S/S | OCEAN BL N/S | \$22,800.71 | 71.56 | 79.91 | Global MR | 2015 |
| 35TH STREET | 1 | VINE AVE N/S | LINDBERG AVE S/S | \$9,881.90 | 74.6 | 82.6 | Global MR | 2015 |
| 3RD AVENUE | 1 | D ST S/S | E ST N/S | \$4,515.62 | 77.71 | 85.35 | Global MR | 2015 |
| 3RD STREET | 1 | BIRCH AVE N/S | PARK AVE N/S | \$70,358.71 | 23.8 | 100 | Major Below Critical | 2015 |
| 3RD STREET | 2 | CENTRAL AVE S/S | ANDERSON AVE N/S | \$3,339.02 | 77.71 | 85.35 | Global MR | 2015 |
| 4TH AVENUE | 1 | E ST N/S | D ST S/S | \$5,072.12 | 70.62 | 79.1 | Global MR | 2015 |
| 4TH AVENUE | 2 | D ST N/S | END | \$41,703.77 | 47.32 | 100 | Major Below Critical | 2015 |
| 4TH COURT | 1 | HIGHLAND AVE N/S | PARK AVE S/S | \$14,133.40 | 50.21 | 100 | Major Below Critical | 2015 |
| 4TH COURT | 2 | PARK AVE N/S | 205' N/O PARK AVE | \$3,357.88 | 65.45 | 100 | Major Above Critical | 2015 |
| 4TH COURT | 3 | 205' N/O PARK AVE | END | \$37,623.90 | 53.26 | 100 | Major Below Critical | 2015 |
| 4TH STREET | 1 | LOCKHART AVE N/S | KRUSE AVE N/S | \$13,292.46 | 76.63 | 84.39 | Global MR | 2015 |
| 4TH STREET | 6 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | \$13,483.26 | 65.45 | 74.53 | Global MR | 2015 |
| 4TH STREET | 7 | COMMERCIAL AVE N/S | MARKET AVE S/S | \$5,925.43 | 68.5 | 77.22 | Global MR | 2015 |
| 4TH STREET | 8 | MARKET AVE N/S | HIGHLAND AVE S/S | \$29,120.11 | 31.92 | 100 | Major Below Critical | 2015 |
| 4TH STREET | 9 | HIGHLAND AVE N/S | PARK AVE S/S | \$13,059.13 | 57.33 | 100 | Major Below Critical | 2015 |
| 5TH AVENUE | 1 | D ST N/S | END | \$2,915.01 | 75.69 | 83.57 | Global MR | 2015 |
| 5TH AVENUE | 2 | D ST S/S | E ST N/S | \$5,302.68 | 63.53 | 72.85 | Global MR | 2015 |
| 5TH STREET | 1 | HIGHLAND AVE N/S | MARKET AVE N/S | \$22,186.29 | 51.23 | 100 | Major Below Critical | 2015 |
| 5TH STREET | 5 | GOLDEN AVE S/S | HALL AVE N/S | \$124,394.34 | 11.6 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| 5TH STREET | 6 | HALL AVE S/S | INGERSOLL AVE N/S | \$51,426.23 | 45.13 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5TH STREET | 7 | INGERSOLL AVE N/S | JOHNSON AVE N/S | \$101,247.28 | 30.91 | 100 | Major Below Critical | 2015 |
| 5TH STREET | 8 | JOHNSON AVE S/S | KRUSE AVE N/S | \$115,888.75 | 18.71 | 100 | Major Below Critical | 2015 |
| 5TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | \$53,793.73 | 56.31 | 100 | Major Below Critical | 2015 |
| 5TH STREET | 10 | FIR AVE N/S | END | \$20,377.99 | 15.67 | 100 | Major Below Critical | 2015 |
| 5TH STREET | 11 | DONNELLY AVE N/S | BENNETT AVE S/S | \$35,020.53 | 58.43 | 100 | Major Below Critical | 2015 |
| 5TH STREET | 12 | BENNETT AVE N/S | ANDERSON AVE S/S | \$4,197.62 | 69.58 | 78.18 | Global MR | 2015 |
| 5TH STREET | 13 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | \$10,547.05 | 64.51 | 73.71 | Global MR | 2015 |
| 6TH STREET | 1 | COMMERCIAL AVE S/S | ANDERSON AVE N/S | \$61,468.84 | 44.11 | 100 | Major Below Critical | 2015 |
| 6TH STREET | 2 | ANDERSON AVE S/S | BENNETT AVE N/S | \$3,339.02 | 65.45 | 74.53 | Global MR | 2015 |
| 6TH STREET | 3 | BENNETT AVE S/S | ELROD AVE N/S | \$9,794.45 | 69.52 | 78.11 | Global MR | 2015 |
| 6TH STREET | 4 | ELROD AVE S/S | CDS | \$4,197.62 | 76.63 | 84.39 | Global MR | 2015 |
| 6TH STREET | 5 | IVY AVE N/S | KOOSBAY BL S/S | \$49,075.65 | 54.28 | 100 | Major Below Critical | 2015 |
| 6TH STREET | 6 | KOOSBAY BL N/S | KINGWOOD AVE S/S | \$14,589.48 | 64.44 | 100 | Major Above Critical | 2015 |
| 6TH STREET | 7 | KINGWOOD AVE N/S | MYRTLE AVE S/S | \$12,099.06 | 65.46 | 100 | Major Above Critical | 2015 |
| 7TH AVENUE | 1 | F ST N/S | E ST S/S | \$30,768.12 | 45.28 | 100 | Major Below Critical | 2015 |
| 7TH AVENUE | 2 | E ST N/S | D ST S/S | \$6,916.53 | 73.66 | 81.77 | Global MR | 2015 |
| 7TH AVENUE | 3 | D ST N/S | END | \$2,798.41 | 74.67 | 82.67 | Global MR | 2015 |
| 7TH AVENUE | 4 | I ST N/S | H ST N/S | \$1,929.21 | 76.7 | 84.46 | Global MR | 2015 |
| 7TH COURT | 1 | FIR AVE N/S | END | \$10,773.78 | 56.31 | 100 | Major Below Critical | 2015 |
| 7TH ROAD | 1 | FIR AVE S/S | 3RD CT N/S | \$3,431.77 | 75.62 | 83.49 | Global MR | 2015 |
| 7TH ROAD | 2 | 3RD CT N/S | DATE AVE N/S | \$8,482.69 | 66.47 | 75.43 | Global MR | 2015 |
| 7TH STREET | 1 | KOOSBAY BL N/S | KINGWOOD AVE N/S | \$109,420.95 | 13.62 | 100 | Major Below Critical | 2015 |
| 7TH STREET | 2 | ANDERSON AVE S/S | DONNELLY AVE N/S | \$54,300.55 | 59.36 | 100 | Major Below Critical | 2015 |
| 7TH STREET | 3 | DONNELLY AVE N/S | ELROD AVE N/S | \$4,865.42 | 76.63 | 84.39 | Global MR | 2015 |
| 7TH STREET | 4 | ELROD AVE N/S | FERGUSON AVE S/S | \$5,533.23 | 65.46 | 74.53 | Global MR | 2015 |
| 7TH STREET | 5 | FERGUSON AVE S/S | HALL ST N/S | \$17,879.64 | 73.58 | 81.7 | Global MR | 2015 |
| 7TH STREET | 7 | INGERSOLL AVE S/S | JOHNSON AVE S/S | \$54,988.78 | 53.26 | 100 | Major Below Critical | 2015 |
| 7TH STREET | 8 | JOHNSON AVE S/S | KRUSE AVE N/S | \$34,603.03 | 60.38 | 100 | Major Above Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| 7TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | \$59,691.69 | 51.23 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7TH STREET | 10 | HEMLOCK AVE S/S | END | \$11,448.05 | 75.62 | 83.49 | Global MR | 2015 |
| 7TH STREET | 12 | PINE AVE S/S | END | \$57,357.43 | 46.15 | 100 | Major Below Critical | 2015 |
| 7TH STREET | 13 | HEMLOCK AVE S/S | END | \$5,509.38 | 74.67 | 82.67 | Global MR | 2015 |
| 7TH TERRACE | 1 | 8TH ST E/S | END | \$15,947.99 | 0 | 100 | Major Below Critical | 2015 |
| 8TH AVENUE | 1 | D ST N/S | END | \$9,196.10 | 55.42 | 100 | Major Below Critical | 2015 |
| 8TH AVENUE | 2 | D ST S/S | E ST N/S | \$5,072.12 | 74.67 | 82.67 | Global MR | 2015 |
| 8TH AVENUE | 3 | E ST S/S | F ST N/S | \$34,881.58 | 50.35 | 100 | Major Below Critical | 2015 |
| 8TH LOOP | 1 | BIRCH AVE N/S | 8TH ST W/S | \$3,847.82 | 77.71 | 85.35 | Global MR | 2015 |
| 8TH STREET | 1 | FIR AVE N/S | HEMLOCK AVE S/S | \$54,259.28 | 57.33 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 2 | HEMLOCK AVE S/S | KOOSBAY BL S/S | \$122,676.92 | 22.77 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 3 | KOOSBAY BL N/S | END | \$75,622.84 | 48.17 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 5 | PINE AVE S/S | REDWOOD AVE N/S | \$36,368.87 | 51.23 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 6 | TEAKWOOD AVE N/S | END | \$10,313.14 | 59.36 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 7 | FERGUSON AVE N/S | ELROD AVE S/S | \$48,341.35 | 23.96 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 8 | ELROD AVE N/S | DONNELLY AVE S/S | \$47,290.45 | 23.96 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 10 | JOHNSON AVE N/S | INGERSOLL AVE S/S | \$123,076.43 | 23.96 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 11 | COMMERCIAL AVE N/S | 8TH TERR N/S | \$4,579.22 | 72.62 | 80.86 | Global MR | 2015 |
| 8TH STREET | 12 | 8TH TERR N/S | 7TH TERR S/S | \$21,905.01 | 48.29 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 13 | DATE AVE S/S | BIRCH AVE S/S | \$9,094.84 | 75.69 | 83.57 | Global MR | 2015 |
| 8TH STREET | 15 | ANDERSON AVE N/S | CENTRAL AVE S/S | \$70,879.97 | 17.94 | 100 | Major Below Critical | 2015 |
| 8TH STREET | 16 | CENTRAL AVE N/S | COMMERCIAL AVE S/S | \$27,628.06 | 50.36 | 100 | Major Below Critical | 2015 |
| 8TH TERRACE | 1 | 8TH ST W/S | 10TH ST E/S | \$8,480.04 | 75.67 | 83.55 | Global MR | 2015 |
| 9TH AVENUE | 1 | E ST N/S | D ST S/S | \$17,100.73 | 64.54 | 100 | Major Above Critical | 2015 |
| 9TH AVENUE | 2 | F ST S/S | H ST N/S | \$11,153.90 | 78.73 | 86.24 | Global MR | 2015 |
| 9TH AVENUE | 3 | H ST N/S | I ST S/S | \$3,180.02 | 78.73 | 86.24 | Global MR | 2015 |
| 9TH STREET | 1 | FIR AVE N/S | DATE AVE N/S | \$43,810.03 | 44.12 | 100 | Major Below Critical | 2015 |
| 9TH STREET | 2 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | \$3,900.82 | 72.62 | 80.86 | Global MR | 2015 |
| 9TH STREET | 3 | CENTRAL AVE S/S | ANDERSON AVE N/S | \$100,782.45 | 4.69 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| 9TH STREET | 04E | ANDERSON AVE S/S | END | \$38,923.52 | 41.19 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9TH STREET | 5 | DONNELLY AVE S/S | ELROD AVE N/S | \$33,467.09 | 23.96 | 100 | Major Below Critical | 2015 |
| 9TH STREET | 6 | ELROD AVE S/S | END | \$124,289.00 | 23.96 | 100 | Major Below Critical | 2015 |
| 9TH STREET | 7 | DATE AVE S/S | END | \$12,521.31 | 62.52 | 71.95 | Global MR | 2015 |
| ACKERMAN STREET | 1 | NEWMARK AVE N/S | END | \$22,124.96 | 74.6 | 82.6 | Global MR | 2015 |
| ADLER AVENUE | 1 | 12TH ST W/S | 13TH ST W/S | \$24,340.60 | 52.39 | 100 | Major Below Critical | 2015 |
| ANDERSON AVENUE | 1 | 10TH ST W/S | 11TH ST W/S | \$21,188.75 | 59.48 | 100 | Major Below Critical | 2015 |
| ANDERSON AVENUE | 2 | 11T ST W/S | END | \$120,140.57 | 46.31 | 100 | Major Below Critical | 2015 |
| ANDERSON AVENUE | 3 | 7TH ST W/S | 10TH ST E/S | \$16,602.33 | 77.71 | 85.35 | Global MR | 2015 |
| ARAGO AVENUE | 1 | MORRISON ST E/S | END | \$34,736.74 | 55.39 | 100 | Major Below Critical | 2015 |
| ARAGO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$8,132.89 | 70.6 | 79.07 | Global MR | 2015 |
| ARAGO AVENUE | 3 | MADISON ST W/S | FILLMORE ST E/S | \$8,132.89 | 74.65 | 82.65 | Global MR | 2015 |
| A STREET | 1 | 1ST AVE E/S | 2ND AVE E/S | \$48,836.06 | 24.02 | 100 | Major Below Critical | 2015 |
| AUGUSTINE AVENUE | 1 | END NORTH | LAKESHORE DR N/S | \$28,832.14 | 68.48 | 77.35 | Global MR | 2015 |
| AUGUSTINE AVENUE | 2 | LAKESHORE DR S/S | END SOUTH | \$11,630.91 | 72.55 | 80.92 | Global MR | 2015 |
| BARHAM TERRACE | 1 | PARK RD W/S | CDS | \$3,423.82 | 65.55 | 74.62 | Global MR | 2015 |
| BAYVIEW DRIVE | 1 | 16TH AVE E/S | END | \$36,091.75 | 56.43 | 100 | Major Below Critical | 2015 |
| BENNETT AVENUE | 1 | 4TH ST W/S | 6TH ST W/S | \$9,460.55 | 67.55 | 76.39 | Global MR | 2015 |
| BENNETT AVENUE | 2 | 6TH ST W/S | 7TH ST E/S | \$15,407.23 | 55.04 | 100 | Major Below Critical | 2015 |
| BIRCH AVENUE | 2 | 8TH ST W/S | END | \$1,865.61 | 77.71 | 85.35 | Global MR | 2015 |
| BIRCH AVENUE | 3 | 12TH ST W/S | 13TH ST E/S | \$12,152.83 | 58.47 | 100 | Major Below Critical | 2015 |
| BLANCO AVENUE | 1 | MORRISON ST E/S | FULTON AVE N/S | \$130,295.44 | 32.07 | 100 | Major Below Critical | 2015 |
| BLANCO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$8,132.89 | 74.65 | 82.65 | Global MR | 2015 |
| BROOKLYN LANE | 1 | WOODLAND DR W/S | BROOKLYN DR E/S | \$51,400.74 | 23.97 | 100 | Major Below Critical | 2015 |
| BRULE STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | \$46,152.18 | 43.11 | 100 | Major Below Critical | 2015 |
| BUTLER ROAD | 1 | OCEAN BL N/S | JUNIPER AVE S/S | \$144,096.34 | 33.12 | 100 | Major Below Critical | 2015 |
| CALIFORNIA AVENUE | 2 | 16TH ST W/S | 19TH ST E/S | \$10,027.65 | 77.64 | 85.28 | Global MR | 2015 |
| CAMMANN STREET | 2 | TAYLOR AVE N/S | GRANT AVE S/S | \$159,412.37 | 23.75 | 100 | Major Below Critical | 2015 |
| CAMMANN STREET | 3 | GRANT AVE S/S | HARRIS AVE N/S | \$140,075.42 | 22.74 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| CAMMANN STREET | 4 | HARRIS AVE N/S | JACKSON AVE N/S | \$148,424.88 | 22.78 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CAMMANN STREET | 5 | JACKSON AVE N/S | SHETTER AVE N/S | \$152,564.54 | 20.75 | 100 | Major Below Critical | 2015 |
| CAMMANN STREET | 6 | SHETTER AVE N/S | NEWMARK AVE N/S | \$88,412.00 | 48.18 | 100 | Major Below Critical | 2015 |
| CAMMANN STREET | 9 | MONTGOMERY AVE N/S | PACIFIC AVE N/S | \$57,273.18 | 46.16 | 100 | Major Below Critical | 2015 |
| CAMMANN STREET | 10 | PACIFIC AVE S/S | END | \$26,235.13 | 62.41 | 71.85 | Global MR | 2015 |
| CANYON DRIVE | 1 | 9TH AVE E/S | SHONSTA WY N/S | \$26,184.91 | 40.23 | 100 | Major Below Critical | 2015 |
| CANYON DRIVE | 2 | SHONSTA WY N/S | CANYON TERR S/S | \$18,359.95 | 61.5 | 100 | Major Above Critical | 2015 |
| CEDAR AVENUE | 1 | 10TH ST W/S | END | \$24,551.34 | 51.34 | 100 | Major Below Critical | 2015 |
| CEDAR AVENUE | 2 | PARK AVE S/S | BIRCH AVE N/S | \$61,581.61 | 33.12 | 100 | Major Below Critical | 2015 |
| CEDAR AVENUE | 3 | 16TH AVE W/S | END | \$7,846.69 | 69.6 | 78.2 | Global MR | 2015 |
| CENTRAL AVENUE | 1 | OCEAN BL E/S | 12TH ST E/S | \$10,971.05 | 75.62 | 83.49 | Global MR | 2015 |
| CENTRAL AVENUE | 2 | 12TH ST E/S | 10TH ST W/S | \$82,211.20 | 43.1 | 100 | Major Below Critical | 2015 |
| CHICKSES DRIVE | 1 | END NORTH | LAKESHORE DR N/S | \$10,231.70 | 78.65 | 86.27 | Global MR | 2015 |
| COMMERCIAL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$4,118.12 | 67.49 | 76.33 | Global MR | 2015 |
| COMMERCIAL AVENUE | 2 | BROADWAY ST W/S | 7TH ST W/S | \$34,837.07 | 76.63 | 84.39 | Global MR | 2015 |
| COMMERCIAL AVENUE | 3 | 7TH ST W/S | 8TH ST W/S | \$950.46 | 69.52 | 100 | Major Above Critical | 2015 |
| COMMERCIAL AVENUE | 5 | 10TH ST W/S | 11TH ST E/S | \$4,457.32 | 77.65 | 85.29 | Global MR | 2015 |
| COMMERCIAL AVENUE | 7 | 12TH ST W/S | 14TH ST E/S | \$68,726.22 | 31.11 | 100 | Major Below Critical | 2015 |
| COMPASS CIRCLE | 1 | RADAR RD E/S | CDS | \$3,906.12 | 71.61 | 79.97 | Global MR | 2015 |
| COTTONWOOD AVENUE | 1 | JUNIPER AVE N/S | END | \$26,436.53 | 73.58 | 81.7 | Global MR | 2015 |
| CROCKER AVENUE | 1 | ST JOHN N/S | HOWARD ST N/S | \$8,718.54 | 73.57 | 81.81 | Global MR | 2015 |
| CROCKER AVENUE | 2 | HOWARD ST N/S | LAKESHORE DR N/S | \$22,260.11 | 61.37 | 71.11 | Global MR | 2015 |
| CROCKER AVENUE | 3 | LAKESHORE DR S/S | END | \$12,799.56 | 62.38 | 72 | Global MR | 2015 |
| CROCKER AVENUE | 4 | ST JOHN N/S | END | \$14,840.07 | 74.6 | 82.6 | Global MR | 2015 |
| CURTIS AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$9,986.81 | 55.39 | 100 | Major Below Critical | 2015 |
| CURTIS AVENUE | 2 | BROADWAY ST W/S | 4TH ST E/S | \$76,027.24 | 46.26 | 100 | Major Below Critical | 2015 |
| CYPRESS POINT | 1 | A ST N/S | END | \$3,845.01 | 66.57 | 100 | Major Above Critical | 2015 |
| DAKOTA AVENUE | 1 | SOUTHWEST BL | END | \$49,040.08 | 19.72 | 100 | Major Below Critical | 2015 |
| DATE AVENUE | 2 | 8TH ST E/S | TELEGRAPH DR E/S | \$21,714.21 | 78.66 | 86.18 | Global MR | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| DATE AVENUE | 3 | TELEGRAPH DR E/S | 3RD CT E/S | \$26,923.62 | 32.93 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DATE AVENUE | 4 | 10TH ST W/S | 10TH CT W/S | \$2,385.01 | 75.67 | 83.55 | Global MR | 2015 |
| DENISE PLACE | 1 | KENTUCKY AVE N/S | CDS | \$7,865.24 | 71.56 | 79.91 | Global MR | 2015 |
| DONNELLY AVENUE | 2 | 6TH ST W/S | 7TH ST E/S | \$52,982.78 | 12.8 | 100 | Major Below Critical | 2015 |
| DONNELLY AVENUE | 3 | 7TH ST W/S | 9TH ST W/S | \$112,964.95 | 12.8 | 100 | Major Below Critical | 2015 |
| D STREET | 1 | HARBORVIEW DR W/S | COOS RIVER HWY E/S | \$15,571.67 | 62.51 | 100 | Major Above Critical | 2015 |
| D STREET | 2 | 6TH AVE W/S | 5TH AVE W/S | \$20,420.41 | 60.48 | 100 | Major Above Critical | 2015 |
| D STREET | 3 | 5TH AVE W/S | 2ND AVE W/S | \$216,215.39 | 33.13 | 100 | Major Below Critical | 2015 |
| D STREET | 5 | 1ST AVE E/S | WHITTY ST W/S | \$11,281.10 | 75.68 | 83.56 | Global MR | 2015 |
| DUNN STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | \$10,631.85 | 61.4 | 70.95 | Global MR | 2015 |
| ELM AVENUE | 1 | 10TH CT E/S | END | \$2,385.01 | 79.72 | 87.12 | Global MR | 2015 |
| ELM STREET | 1 | 7TH RD E/S | END | \$1,860.31 | 67.49 | 76.33 | Global MR | 2015 |
| ELROD AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$1,812.61 | 67.55 | 76.39 | Global MR | 2015 |
| ELROD AVENUE | 3 | 4TH ST W/S | 7TH ST E/S | \$13,912.57 | 60.46 | 70.13 | Global MR | 2015 |
| ELROD AVENUE | 4 | 7TH ST W/S | 10TH ST W/S | \$74,133.89 | 57.42 | 100 | Major Below Critical | 2015 |
| ELROD AVENUE | 5 | 10TH ST W/S | 12TH ST W/S | \$7,618.79 | 63.5 | 72.82 | Global MR | 2015 |
| EMPIRE BOULEVARD | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | \$6,678.03 | 76.62 | 84.49 | Global MR | 2015 |
| EMPIRE BOULEVARD | 2 | NEWMARK AVE N/S | CITY LIMITS | \$401,401.86 | 54 | 100 | Major Below Critical | 2015 |
| E STREET | 1 | 2ND AV W/S | 6TH ST W/S | \$200,246.73 | 29.09 | 100 | Major Below Critical | 2015 |
| E STREET | 2 | 6TH AVE E/S | 9TH ST W/S | \$61,923.79 | 43.27 | 100 | Major Below Critical | 2015 |
| E STREET | 3 | 9TH ST W/S | 11TH ST E/S | \$107,469.08 | 23.01 | 100 | Major Below Critical | 2015 |
| E STREET | 4 | 11TH ST E/S | 14TH AVE W/S | \$114,776.06 | 25.04 | 100 | Major Below Critical | 2015 |
| EVERGREEN DRIVE | 1 | TIMBERLINE DR E/S | TIMBERLINE DR S/S | \$33,449.55 | 62.49 | 100 | Major Above Critical | 2015 |
| EVERGREEN DRIVE | 2 | 17TH AVE W/S | 16TH AVE E/S | \$13,946.74 | 53.39 | 100 | Major Below Critical | 2015 |
| FENWICK AVENUE | 2 | ST JOHN ST S/S | LAKESHORE DR N/S | \$109,427.16 | 60.38 | 100 | Major Above Critical | 2015 |
| FERGUSON AVENUE | 1 | 7TH ST W/S | 9TH ST E/S | \$99,027.01 | 23.96 | 100 | Major Below Critical | 2015 |
| FERGUSON AVENUE | 2 | 9TH ST W/S | 10TH ST E/S | \$52,052.48 | 12.8 | 100 | Major Below Critical | 2015 |
| FERGUSON AVENUE | 3 | 10TH ST W/S | 11TH ST E/S | \$50,720.70 | 21.93 | 100 | Major Below Critical | 2015 |
| FERGUSON AVENUE | 4 | 11TH ST W/S | 12TH CT E/S | \$26,660.50 | 36.12 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| FERN COURT | 1 | EVERGREEN DR W/S | CDS | \$4,854.82 | 78.72 | 86.24 | Global MR | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| FILBERT AVENUE | 2 | 18TH AVE E/S | END | \$10,910.10 | 73.65 | 81.77 | Global MR | 2015 |
| FINK STREET | 1 | WHITTY ST W/S | BESSIE ST E/S | \$17,975.96 | 62.51 | 100 | Major Above Critical | 2015 |
| FINK STREET | 2 | WHITTY ST E/S | 1ST AVE W/S | \$34,075.09 | 54.41 | 100 | Major Below Critical | 2015 |
| FIR AVENUE | 1 | 9TH ST E/S | 8TH ST W/S | \$28,975.52 | 34.98 | 100 | Major Below Critical | 2015 |
| FIR AVENUE | 2 | 7TH CT W/S | 4TH ST W/S | \$14,945.32 | 64.44 | 100 | Major Above Critical | 2015 |
| FIR STREET | 1 | NEWMARK AVE S/S | WALNUT AVE S/S | \$33,668.41 | 71.56 | 79.91 | Global MR | 2015 |
| FLANAGAN AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | \$53,279.73 | 49.21 | 100 | Major Below Critical | 2015 |
| FLANAGAN AVENUE | 2 | MORRISON ST E/S | END | \$52,706.83 | 43.11 | 100 | Major Below Critical | 2015 |
| FRONT STREET | 1 | JOHNSON AVE N/S | INGERSOLL AVE N/S | \$6,587.93 | 78.66 | 86.18 | Global MR | 2015 |
| F STREET | 1 | 6TH ST E/S | 9TH AVE W/S | \$13,371.96 | 78.72 | 86.24 | Global MR | 2015 |
| F STREET | 2 | 9TH AVE W/S | 10TH AVE W/S | \$19,794.55 | 52.37 | 100 | Major Below Critical | 2015 |
| F STREET | 3 | 10TH AVE W/S | 12TH AVE E/S | \$6,826.43 | 78.72 | 86.24 | Global MR | 2015 |
| F STREET | 4 | 12TH AVE E/S | 12TH CT W/S | \$15,892.43 | 35.14 | 100 | Major Below Critical | 2015 |
| FULTON AVENUE | 1 | EMPIRE BL E/S | WASSON ST W/S | \$54,112.66 | 59.36 | 100 | Major Below Critical | 2015 |
| FULTON AVENUE | 3 | CAMMANN ST W/S | END | \$2,928.26 | 78.67 | 86.18 | Global MR | 2015 |
| FULTON AVENUE | 4 | MADISON ST W/S | MORRISON ST W/S | \$8,395.24 | 79.68 | 87.08 | Global MR | 2015 |
| FULTON AVENUE | 6 | 390' E/O MORRISON ST | PREFONTAINE DR W/S | \$192,228.33 | 25.84 | 100 | Major Below Critical | 2015 |
| FULTON AVENUE | 7 | PREFONTAINE DR W/S | RADAR RD E/S | \$110,942.41 | 21.78 | 100 | Major Below Critical | 2015 |
| GARFIELD AVENUE | 1 | MORRISON ST E/S | END | \$6,383.88 | 75.62 | 83.5 | Global MR | 2015 |
| GARFIELD AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$8,132.89 | 70.54 | 79.02 | Global MR | 2015 |
| GARFIELD AVENUE | 3 | MADISON ST E/S | END | \$34,780.75 | 59.36 | 100 | Major Below Critical | 2015 |
| GOLDEN AVENUE | 1 | 7TH ST E/S | 5TH ST E/S | \$7,632.04 | 62.4 | 71.84 | Global MR | 2015 |
| GOLDEN AVENUE | 2 | 5TH ST E/S | 4TH ST W/S | \$38,885.40 | 55.29 | 100 | Major Below Critical | 2015 |
| GOLDEN AVENUE | 3 | 4TH ST E/S | BROADWAY ST W/S | \$53,199.86 | 62.4 | 100 | Major Above Critical | 2015 |
| HALL AVENUE | 1 | 7TH ST E/S | 4TH ST W/S | \$69,876.99 | 43.1 | 100 | Major Below Critical | 2015 |
| HALL AVENUE | 2 | 4TH ST E/S | 2ND ST W/S | \$33,952.77 | 45.13 | 100 | Major Below Critical | 2015 |
| HALL AVENUE | 3 | 2ND ST E/S | ALLEY E/S | \$12,056.35 | 59.36 | 100 | Major Below Critical | 2015 |
| HALL AVENUE | 4 | ALLEY E/S | BROADWAY ST W/S | \$2,544.01 | 76.63 | 84.39 | Global MR | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| HARBORVIEW COURT | 1 | HARBORVIEW DR W/S | END | \$8,368.04 | 53.39 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| HARBORVIEW DRIVE | 1 | D ST S/S | END | \$25,612.01 | 41.23 | 100 | Major Below Critical | 2015 |
| HEMLOCK AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | \$77,312.66 | 56.3 | 100 | Major Below Critical | 2015 |
| HEMLOCK AVENUE | 2 | 10TH ST W/S | 13TH ST E/S | \$15,600.63 | 74.6 | 82.6 | Global MR | 2015 |
| HIGHLAND AVENUE | 1 | BROADWAY ST W/S | 2ND ST E/S | \$2,607.61 | 79.68 | 87.08 | Global MR | 2015 |
| HIGHLAND AVENUE | 2 | 2ND ST W/S | 5TH ST E/S | \$10,003.80 | 78.66 | 86.18 | Global MR | 2015 |
| HIGHLAND AVENUE | 3 | OCEAN BL E/S | 13TH ST E/S | \$4,820.37 | 72.65 | 80.89 | Global MR | 2015 |
| H STREET | 1 | 6TH AVE E/S | 9TH AVE W/S | \$70,972.24 | 45.3 | 100 | Major Below Critical | 2015 |
| IDAHO AVENUE | 1 | SOUTHWEST BL W/S | END | \$95,202.55 | 49.19 | 100 | Major Below Critical | 2015 |
| INGERSOLL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$4,632.22 | 69.52 | 78.11 | Global MR | 2015 |
| INGERSOLL AVENUE | 2 | BROADWAY AVE W/S | 2ND ST E/S | \$90,419.30 | 27.85 | 100 | Major Below Critical | 2015 |
| INGERSOLL AVENUE | 3 | 2ND ST W/S | 4TH ST E/S | \$65,548.34 | 34.96 | 100 | Major Below Critical | 2015 |
| INGERSOLL AVENUE | 4 | 4TH ST W/S | 5TH ST E/S | \$72,655.94 | 26.83 | 100 | Major Below Critical | 2015 |
| INGERSOLL AVENUE | 5 | 5TH ST W/S | 7TH ST E/S | \$94,757.66 | 19.72 | 100 | Major Below Critical | 2015 |
| INGERSOLL AVENUE | 6 | 7TH ST W/S | 10TH ST E/S | \$45,437.48 | 56.3 | 100 | Major Below Critical | 2015 |
| INGERSOLL AVENUE | 7 | 10TH ST E/S | 11TH ST W/S | \$7,512.79 | 73.58 | 81.7 | Global MR | 2015 |
| INGERSOLL AVENUE | 8 | 11TH ST W/S | END | \$16,470.30 | 56.3 | 100 | Major Below Critical | 2015 |
| I STREET | 1 | 14TH AVE E/S | 17TH AVE E/S | \$86,203.04 | 34.13 | 100 | Major Below Critical | 2015 |
| IVY AVENUE | 1 | BAYSHORE DR W/S | 7TH ST E/S | \$11,471.91 | 62.41 | 71.85 | Global MR | 2015 |
| JACKSON STREET | 1 | 1ST AVE W/S | MERCHANT ST W/S | \$48,752.41 | 34.15 | 100 | Major Below Critical | 2015 |
| JOHN AVENUE | 1 | END WEST | LAKESHORE DR W/S | \$1,245.75 | 68.49 | 100 | Major Above Critical | 2015 |
| JOHNSON AVENUE | 1 | BROADWAY ST W/S | 4TH ST E/S | \$144,587.38 | 34.96 | 100 | Major Below Critical | 2015 |
| JOHNSON AVENUE | 2 | 4TH ST W/S | 5TH ST E/S | \$7,131.18 | 72.56 | 80.8 | Global MR | 2015 |
| JOHNSON AVENUE | 3 | 5TH ST W/S | 7TH ST W/S | \$7,957.99 | 66.47 | 75.42 | Global MR | 2015 |
| JOHNSON AVENUE | 5 | BROADWAY ST E/S | 1ST ST W/S | \$6,084.43 | 79.68 | 87.08 | Global MR | 2015 |
| JOHNSON AVENUE | 6 | 1ST ST E/S | FRONT ST W/S | \$6,413.03 | 77.65 | 85.28 | Global MR | 2015 |
| JUNIPER AVENUE | 1 | 20TH ST E/S | 19TH ST W/S | \$34,199.18 | 52.35 | 100 | Major Below Critical | 2015 |
| JUNIPER AVENUE | 2 | 19TH ST E/S | COTTONWOOD AVE E/S | \$103,101.23 | 58.43 | 100 | Major Below Critical | 2015 |
| JUNIPER AVENUE | 4 | BUTLER RD W/S | 14TH ST W/S | \$68,696.26 | 35.99 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| JUNIPER AVENUE | 5 | 14TH ST W/S | 13TH ST E/S | \$6,609.13 | 73.58 | 81.7 | Global MR | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| JUNIPER AVENUE | 6 | 13TH ST E/S | END | \$43,001.22 | 41.07 | 100 | Major Below Critical | 2015 |
| JUNIPER AVENUE | 7 | MYRTLE AVE S/S | 20TH ST E/S | \$8,832.49 | 72.63 | 80.87 | Global MR | 2015 |
| KENTUCKY AVENUE | 2 | JEFFERSON ST E/S | MORRISON ST W/S | \$18,571.29 | 79.68 | 87.08 | Global MR | 2015 |
| KENTUCKY AVENUE | 3 | MORRISON ST E/S | 125' W/O TRICIA PL | \$5,024.42 | 73.59 | 81.71 | Global MR | 2015 |
| KENTUCKY AVENUE | 4 | 125' W/O TRICIA PL | PREFONTAINE DR W/S | \$111,253.19 | 36 | 100 | Major Below Critical | 2015 |
| KINGWOOD AVENUE | 1 | 7TH ST E/S | BAYSHORE DR W/S | \$58,267.33 | 45.12 | 100 | Major Below Critical | 2015 |
| KINNEY ROAD | 1 | THOMPSON RD N/S | CITY LIMITS | \$46,652.98 | 29.03 | 100 | Major Below Critical | 2015 |
| KNOT TERRACE | 1 | 28TH CT W/S | END | \$6,521.68 | 63.11 | 75.82 | Global MR | 2015 |
| KOOSBAY BOULEVARD | 2 | 10TH ST E/S | TEAKWOOD AVE S/S | \$5,338.56 | 69.59 | 100 | Major Above Critical | 2015 |
| KOOSBAY BOULEVARD | 3 | TEAKWOOD AVE S/S | CITY LIMITS | \$210,962.12 | 44.24 | 100 | Major Below Critical | 2015 |
| KRUSE AVENUE | 1 | BROADWAY ST W/S | 4TH ST E/S | \$29,369.52 | 66.47 | 100 | Major Above Critical | 2015 |
| KRUSE AVENUE | 2 | 5TH ST W/S | 7TH ST E/S | \$113,097.85 | 14.65 | 100 | Major Below Critical | 2015 |
| LA CLAIR STREET | 1 | OCEAN BL N/S | NEWMARK AVE S/S | \$437,477.21 | 24.82 | 100 | Major Below Critical | 2015 |
| LAKESHORE DRIVE | 1 | TAYLOR AVE N/S | CHICKSES DR W/S | \$21,369.70 | 77.63 | 85.38 | Global MR | 2015 |
| LAKESHORE DRIVE | 2 | CHICKSES DR W/S | SEABREEZE TER E/S | \$16,578.48 | 78.65 | 86.27 | Global MR | 2015 |
| LAKESHORE DRIVE | 3 | SEABREEZE TER E/S | CROCKER AVE E/S | \$24,417.22 | 66.45 | 75.57 | Global MR | 2015 |
| LAKESHORE DRIVE | 4 | CROCKER AVE E/S | CITY LIMITS EAST | \$21,200.10 | 79.67 | 87.16 | Global MR | 2015 |
| LAUREL AVENUE | 1 | 14TH ST W/S | END | \$3,376.12 | 75.67 | 83.55 | Global MR | 2015 |
| LEAF TERRACE | 1 | 28TH CT W/S | END | \$6,299.08 | 68.23 | 79.87 | Global MR | 2015 |
| LIMNELL STREET | 1 | FINK ST S/S | END | \$2,480.41 | 71.64 | 79.99 | Global MR | 2015 |
| LINCOLN BOULEVARD | 1 | WEST HILLS BL S/S | OAKWAY DR E/S | \$105,024.74 | 36.16 | 100 | Major Below Critical | 2015 |
| LINDBERG AVENUE | 2 | BRULE ST W/S | END | \$9,738.80 | 61.4 | 70.95 | Global MR | 2015 |
| LINDY LANE | 1 | OCEAN BL S/S | END | \$1,033.51 | 73.59 | 81.71 | Global MR | 2015 |
| LISA PLACE | 1 | KENTUCKY AVE S/S | CDS | \$4,587.17 | 75.62 | 83.5 | Global MR | 2015 |
| MADISON STREET | 1 | MARSHALL AVE N/S | KENTUCKY AVE S/S | \$3,736.52 | 77.65 | 85.29 | Global MR | 2015 |
| MADISON STREET | 3 | FULTON AVE N/S | PACIFIC AVE S/S | \$18,642.84 | 78.67 | 86.18 | Global MR | 2015 |
| MADISON STREET | 4 | PACIFIC AVE N/S | GARFIELD AVE S/S | \$4,173.77 | 79.68 | 87.08 | Global MR | 2015 |
| MADISON STREET | 5 | GARFIELD AVE N/S | MICHIGAN AVE S/S | \$23,465.86 | 75.62 | 83.5 | Global MR | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| MAIN STREET | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | \$16,230.45 | 65.46 | 100 | Major Above Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MARKET AVENUE | 1 | 1ST ST W/S | BROADWAY E/S | \$4,237.37 | 73.35 | 83.92 | Global MR | 2015 |
| MARKET AVENUE | 2 | BROADWAY W/S | 4TH ST W/S | \$103,172.61 | 48.29 | 100 | Major Below Critical | 2015 |
| MARKET AVENUE | 3 | 4TH ST W/S | 5TH ST E/S | \$3,847.82 | 60.46 | 70.13 | Global MR | 2015 |
| MARKET AVENUE | 4 | 5TH ST W/S | END | \$36,377.27 | 23.96 | 100 | Major Below Critical | 2015 |
| MARPLE STREET | 1 | FULTON ST N/S | PACIFIC AVE S/S | \$63,809.26 | 60.38 | 100 | Major Above Critical | 2015 |
| MARPLE STREET | 2 | PACIFIC AVE N/S | MICHIGAN AVE S/S | \$26,497.48 | 60.38 | 70.06 | Global MR | 2015 |
| MARPLE STREET | 3 | MICHIGAN AVE N/S | NEWMARK AVE S/S | \$13,308.36 | 61.4 | 70.95 | Global MR | 2015 |
| MARPLE STREET | 4 | NEWMARK AVE N/S | SCHETTER AVE N/S | \$14,193.47 | 72.57 | 80.81 | Global MR | 2015 |
| MARPLE STREET | 5 | SCHETTER AVE N/S | JACKSON AVE N/S | \$37,630.43 | 59.36 | 100 | Major Below Critical | 2015 |
| MARPLE STREET | 6 | JACKSON AVE N/S | HARRIS AVE S/S | \$37,474.04 | 57.33 | 100 | Major Below Critical | 2015 |
| MARPLE STREET | 7 | HARRIS AVE S/S | GRANT AVE N/S | \$9,497.65 | 61.4 | 70.95 | Global MR | 2015 |
| MARPLE STREET | 8 | GRANT AVE N/S | TAYLOR AVE N/S | \$29,074.72 | 54.29 | 100 | Major Below Critical | 2015 |
| MARYLAND AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | \$8,379.34 | 70.54 | 79.02 | Global MR | 2015 |
| MARYLAND AVENUE | 2 | MORRISON ST E/S | SCHONEMAN ST W/S | \$28,382.13 | 58.35 | 100 | Major Below Critical | 2015 |
| MERCHANT STREET | 2 | JACKSON ST S/S | D ST N/S | \$14,695.28 | 53.4 | 100 | Major Below Critical | 2015 |
| MERCHANT STREET | 3 | D ST S/S | FINK ST N/S | \$13,446.13 | 56.44 | 100 | Major Below Critical | 2015 |
| MERRILL STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | \$11,980.71 | 70.54 | 79.02 | Global MR | 2015 |
| MICHIGAN AVENUE | 1 | MILL ST E/S | EMPIRE BL W/S | \$15,285.94 | 38.03 | 100 | Major Below Critical | 2015 |
| MICHIGAN AVENUE | 2 | EMPIRE BL E/S | MARPLE ST E/S | \$124,700.37 | 23.81 | 100 | Major Below Critical | 2015 |
| MICHIGAN AVENUE | 3 | MARPLE ST E/S | CAMMANN ST W/S | \$149,139.44 | 47.17 | 100 | Major Below Critical | 2015 |
| MICHIGAN AVENUE | 4 | CAMMANN ST E/S | MADISON ST E/S | \$30,353.45 | 63.43 | 100 | Major Above Critical | 2015 |
| MICHIGAN AVENUE | 5 | MADISON ST E/S | MORRISON ST W/S | \$141,489.97 | 22.79 | 100 | Major Below Critical | 2015 |
| MICHIGAN AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST E/S | \$7,512.79 | 76.63 | 84.39 | Global MR | 2015 |
| MICHIGAN AVENUE | 7 | SCHONEMAN ST E/S | END | \$8,347.54 | 72.57 | 80.81 | Global MR | 2015 |
| MILL STREET | 1 | NEWMARK AVE S/S | MICHIGAN AVE N/S | \$7,642.64 | 78.67 | 86.18 | Global MR | 2015 |
| MINNESOTA AVENUE | 1 | SOUTHWEST BL N/S | 14TH ST W/S | \$215,390.86 | 29.88 | 100 | Major Below Critical | 2015 |
| MONTGOMERY AVENUE | 1 | MARPLE ST W/S | CDS | \$3,445.02 | 74.6 | 82.6 | Global MR | 2015 |
| MONTGOMERY AVENUE | 2 | MARPLE ST E/S | WALL ST W/S | \$4,547.42 | 71.56 | 79.91 | Global MR | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| MONTGOMERY AVENUE | 3 | WALL ST E/S | WASSON ST W/S | \$4,634.87 | 76.63 | 84.39 | Global MR | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MONTGOMERY AVENUE | 4 | WASSON ST E/S | CAMMANN ST W/S | \$21,898.84 | 56.32 | 100 | Major Below Critical | 2015 |
| MONTGOMERY AVENUE | 5 | MORRISON ST W/S | END | \$3,985.62 | 62.41 | 71.85 | Global MR | 2015 |
| MONTGOMERY AVENUE | 6 | MORRISON ST E/S | END | \$104,902.35 | 5.52 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 1 | LAKESHORE DR S/S | PIRATES CT S/S | \$75,473.86 | 56.29 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 2 | PIRATES CT S/S | HARRIS AVE N/S | \$16,398.28 | 69.5 | 78.25 | Global MR | 2015 |
| MORRISON STREET | 4 | NEWMARK AVE S/S | SALMON AVE N/S | \$35,200.87 | 39.05 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 5 | SALMON AVE N/S | MICHIGAN AVE N/S | \$33,419.00 | 52.25 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 6 | MICHIGAN AVE N/S | MONTGOMERY AVE S/S | \$19,551.79 | 76.63 | 84.39 | Global MR | 2015 |
| MORRISON STREET | 7 | MONTGOMERY AVE S/S | PACIFIC AVE N/S | \$113,916.58 | 28.89 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 8 | PACIFIC AVE N/S | WEBSTER AVE S/S | \$130,358.15 | 28.89 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 9 | WEBSTER AVE S/S | BLANCO AVE S/S | \$25,106.11 | 53.24 | 100 | Major Below Critical | 2015 |
| MORRISON STREET | 10 | WEBSTER AVE S/S | BLANCO AVE S/S | \$18,102.24 | 74.6 | 82.6 | Global MR | 2015 |
| MYRTLE AVENUE | 1 | BAYSHORE DR W/S | 6TH ST E/S | \$3,529.82 | 79.68 | 87.08 | Global MR | 2015 |
| MYRTLE AVENUE | 3 | 14TH ST E/S | END | \$10,006.53 | 64.52 | 100 | Major Above Critical | 2015 |
| MYRTLE AVENUE | 4 | JUNIPER AVE E/S | WOODLAND AVE E/S | \$8,310.44 | 65.53 | 74.61 | Global MR | 2015 |
| NEWMARK AVENUE | 4 | EMPIRE BL W/S | MILL ST W/S | \$19,107.91 | 48.19 | 100 | Major Below Critical | 2015 |
| NEWMARK AVENUE | 5 | MILL ST W/S | END | \$5,180.77 | 70.54 | 79.02 | Global MR | 2015 |
| NOBLE AVENUE | 1 | CAMMANN ST W/S | WASSON ST E/S | \$4,547.42 | 70.54 | 79.02 | Global MR | 2015 |
| NOBLE AVENUE | 2 | WASSON ST W/S | WALL ST E/S | \$4,634.87 | 76.63 | 84.39 | Global MR | 2015 |
| NOBLE AVENUE | 3 | WALL ST W/S | MARPLE ST E/S | \$4,547.42 | 74.6 | 82.6 | Global MR | 2015 |
| NOBLE AVENUE | 4 | MARPLE ST W/S | EMPIRE BL E/S | \$4,372.52 | 76.63 | 84.39 | Global MR | 2015 |
| NOBLE AVENUE | 5 | MADISON ST E/S | MORRISON ST W/S | \$8,379.34 | 75.62 | 83.5 | Global MR | 2015 |
| NOBLE AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST W/S | \$6,757.53 | 68.51 | 77.23 | Global MR | 2015 |
| NORMAN AVENUE | 2 | NEWMARK AVE S/S | OCEAN BL N/S | \$128,401.09 | 50.22 | 100 | Major Below Critical | 2015 |
| NUTWOOD AVENUE | 1 | 14TH ST W/S | 15TH ST E/S | \$17,685.91 | 38.16 | 100 | Major Below Critical | 2015 |
| OAKWAY COURT | 1 | OAKWAY DR W/S | END | \$1,486.66 | 72.64 | 80.88 | Global MR | 2015 |
| OAKWAY DRIVE | 2 | LINCOLN RD S/S (E) | LINCOLN RD N/S (W) | \$23,516.21 | 60.48 | 70.16 | Global MR | 2015 |
| OCEAN BOULEVARD | 1 | CENTRAL AVE N/S | LINCOLN RD N/S | \$80,358.98 | 77 | 84.76 | Global MR | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| OCEAN BOULEVARD | 2 | LINCOLN RD N/S | WOODLAND RD W/S | \$86,467.27 | 79 | 86.52 | Global MR | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OCEAN TERRACE | 1 | LINCOLN RD N/S | WEST HILLS BL E/S | \$4,833.62 | 75.68 | 83.56 | Global MR | 2015 |
| OREGON AVENUE | 1 | SOUTHWEST BL W/S | END | \$65,849.97 | 60.37 | 100 | Major Above Critical | 2015 |
| PACIFIC AVENUE | 2 | FILLMORE AVE W/S | MORRISON ST W/S | \$17,929.99 | 72.62 | 80.86 | Global MR | 2015 |
| PACIFIC AVENUE | 3 | MORRISON ST E/S | END | \$288,946.50 | 33.12 | 100 | Major Below Critical | 2015 |
| PARK AVENUE | 1 | TELEGRAPH DR S/S | 4TH CT W/S | \$150,398.43 | 18.7 | 100 | Major Below Critical | 2015 |
| PARK AVENUE | 2 | 4TH CT W/S | 4TH ST W/S | \$3,047.51 | 68.5 | 77.22 | Global MR | 2015 |
| PARK AVENUE | 3 | 4TH ST W/S | BROADWAY ST W/S | \$12,163.56 | 71.55 | 79.9 | Global MR | 2015 |
| PARK AVENUE | 4 | 14TH ST E/S | CEDAR AVE S/S | \$104,807.06 | 47.31 | 100 | Major Below Critical | 2015 |
| PARK AVENUE | 5 | 11TH ST W/S | END | \$97,078.63 | 26.05 | 100 | Major Below Critical | 2015 |
| PENNSYLVANIA AVENUE | 1 | SOUTHWEST BL W/S | 17TH ST W/S | \$287,063.87 | 8.54 | 100 | Major Below Critical | 2015 |
| PENNSYLVANIA AVENUE | 2 | 17TH ST W/S | 19TH ST W/S | \$50,970.39 | 52.24 | 100 | Major Below Critical | 2015 |
| PINE AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | \$9,826.25 | 69.52 | 78.12 | Global MR | 2015 |
| PREFONTAINE DRIVE | 1 | NAUTICAL LN N/S | FULTON AVE S/S | \$298,526.37 | 23.81 | 100 | Major Below Critical | 2015 |
| RADAR ROAD | 1 | FULTON AVE N/S | OCEAN BL S/S | \$636,399.53 | 22.94 | 100 | Major Below Critical | 2015 |
| REDWOOD AVENUE | 1 | 8TH ST W/S | 11TH ST E/S | \$38,552.82 | 47.17 | 100 | Major Below Critical | 2015 |
| SALMON AVENUE | 1 | MORRISON ST E/S | SCHONEMAN ST W/S | \$6,577.33 | 72.62 | 80.86 | Global MR | 2015 |
| SALMON AVENUE | 2 | SCHONEMAN ST E/S | END | \$7,801.64 | 76.68 | 84.44 | Global MR | 2015 |
| SANFORD AVENUE | 1 | END NORTH | VIRGINIA AVE N/S | \$3,431.77 | 79.67 | 87.16 | Global MR | 2015 |
| SANFORD AVENUE | 2 | VIRGINIA AVE S/S | LAKESHORE DR N/S | \$40,365.00 | 64.42 | 73.78 | Global MR | 2015 |
| SCHETTER AVENUE | 1 | MARPLE ST E/S | WALL ST W/S | \$7,022.53 | 79.67 | 87.16 | Global MR | 2015 |
| SCHETTER AVENUE | 2 | WALL ST E/S | WASSON ST W/S | \$7,441.24 | 76.62 | 84.49 | Global MR | 2015 |
| SCHONEMAN STREET | 1 | HARRIS AVE S/S | NEWMARK AVE N/S | \$246,898.23 | 31.94 | 100 | Major Below Critical | 2015 |
| SCHONEMAN STREET | 2 | NEWMARK AVE S/S | MICHIGAN AVE N/S | \$9,619.55 | 65.46 | 74.54 | Global MR | 2015 |
| SCHONEMAN STREET | 3 | MICHIGAN AVE S/S | FLANAGAN AVE N/S | \$55,188.90 | 58.43 | 100 | Major Below Critical | 2015 |
| SEABREEZE TERRACE | 1 | TIDEVIEW TERRACE S/S | LAKESHORE DR N/S | \$26,724.12 | 47.14 | 100 | Major Below Critical | 2015 |
| SEABREEZE TERRACE | 2 | LAKESHORE DR S/S | LAKEWOOD LN N/S | \$6,752.23 | 66.45 | 75.57 | Global MR | 2015 |
| SEAGATE STREET | 3 | LAKESHORE DR S/S | END SOUTH | \$12,505.41 | 65.43 | 74.68 | Global MR | 2015 |
| SHON-STA WAY | 1 | CANYON DR E/S | END | \$6,688.51 | 64.54 | 100 | Major Above Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| SIGNAL WAY | 1 | DATE AVE S/S | TELEGRAPH DR E/S | \$84,198.99 | 50.21 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SOUTHWEST BOULEVARD | 3 | MONTANA AVE S/S | WASHINGTON AVE S/S | \$193,438.11 | 46.14 | 100 | Major Below Critical | 2015 |
| SOUTHWEST BOULEVARD | 4 | WASHINGTON AVE S/S | 7TH ST E/S | \$44,024.66 | 73.58 | 81.7 | Global MR | 2015 |
| SPRUCE AVENUE | 1 | 11TH ST W/S | END | \$1,484.01 | 74.6 | 82.6 | Global MR | 2015 |
| TAYLOR AVENUE | 1 | MARPLE ST W/S | WALL ST W/S | \$3,964.42 | 72.55 | 80.92 | Global MR | 2015 |
| TAYLOR AVENUE | 2 | WALL ST W/S | WASSON ST W/S | \$5,088.02 | 78.65 | 86.27 | Global MR | 2015 |
| TELEGRAPH DRIVE | 1 | DATE AVE (E) S/S | PARK AVE E/S | \$167,416.35 | 37 | 100 | Major Below Critical | 2015 |
| TELEGRAPH DRIVE | 2 | PARK AVE E/S | DATE AVE (W) S/S | \$120,898.82 | 44.11 | 100 | Major Below Critical | 2015 |
| THOMPSON ROAD | 1 | KOOSBAY BL W/S | 15TH CT W/S | \$24,857.12 | 79.72 | 87.12 | Global MR | 2015 |
| THOMPSON ROAD | 2 | 15TH CT W/S | KINNEY RD E/S | \$37,161.13 | 75.67 | 83.55 | Global MR | 2015 |
| THOMPSON ROAD | 3 | KINNEY RD E/S | WOODLAND DR E/S | \$10,971.05 | 77.7 | 85.33 | Global MR | 2015 |
| THOMAS STREET | 1 | LA CLAIR ST E/S | END | \$6,310.26 | 68.51 | 100 | Major Above Critical | 2015 |
| TRICIA PLACE | 1 | KENTUCKY AVE N/S | CDS | \$27,697.04 | 51.24 | 100 | Major Below Critical | 2015 |
| TWIG TERRACE | 1 | 28TH CT W/S | CDS | \$6,055.28 | 65.16 | 77.44 | Global MR | 2015 |
| UNDERWOOD AVENUE | 1 | 8TH ST W/S | END | \$14,655.89 | 54.28 | 100 | Major Below Critical | 2015 |
| VINE AVENUE | 1 | 34TH ST W/S | OCEAN BL E/S | \$7,433.29 | 79.68 | 87.08 | Global MR | 2015 |
| VIRGINIA AVENUE | 1 | FENWICK AVE E/S | CROCKER AVE W/S | \$9,100.14 | 78.65 | 86.27 | Global MR | 2015 |
| WALLACE STREET | 1 | NEWMARK AVE S/S | OCEAN BL N/S | \$39,138.55 | 61.4 | 100 | Major Above Critical | 2015 |
| WALLACE STREET | 2 | OCEAN BL S/S | END | \$53,936.88 | 44.24 | 100 | Major Below Critical | 2015 |
| WALL STREET | 1 | TAYLOR AVE S/S | HARRIS AVE S/S | \$19,557.09 | 73.57 | 81.81 | Global MR | 2015 |
| WALL STREET | 2 | HARRIS AVE S/S | SCHETTER AVE N/S | \$76,583.56 | 58.32 | 100 | Major Below Critical | 2015 |
| WALL STREET | 4 | NEWMARK AVE S/S | MICHIGAN AVE N/S | \$58,304.77 | 57.33 | 100 | Major Below Critical | 2015 |
| WALL STREET | 5 | MICHIGAN AVE S/S | PACIFIC AVE N/S | \$25,097.57 | 67.49 | 100 | Major Above Critical | 2015 |
| WALL STREET | 6 | PACIFIC AVE S/S | FULTON AVE N/S | \$17,577.54 | 73.59 | 81.71 | Global MR | 2015 |
| WASHINGTON AVENUE | 1 | SOUTHWEST BL W/S | END | \$102,785.06 | 45.12 | 100 | Major Below Critical | 2015 |
| WASSON STREET | 1 | HARRIS AVE S/S | TAYLOR AVE N/S | \$105,457.39 | 53.24 | 100 | Major Below Critical | 2015 |
| WASSON STREET | 4 | NEWMARK AVE S/S | MICHIGAN AVE N/S | \$158,989.31 | 30.92 | 100 | Major Below Critical | 2015 |
| WASSON STREET | 5 | MICHIGAN AVE S/S | NOBLE AVE N/S | \$100,375.24 | 31.94 | 100 | Major Below Critical | 2015 |
| WASSON STREET | 6 | NOBLE AVE N/S | PACIFIC AVE N/S | \$119,163.27 | 44.13 | 100 | Major Below Critical | 2015 |

## City of Coos Bay <br> Unlimited Budget

## 2015

| WASSON STREET | 7 | PACIFIC AVE S/S | END | \$166,815.10 | 44.13 | 100 | Major Below Critical | 2015 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WEBSTER AVENUE | 1 | MADISON ST W/S | END | \$7,783.09 | 75.67 | 83.54 | Global MR | 2015 |
| WEBSTER AVENUE | 2 | MADISON ST E/S | MORRISON ST W/S | \$8,132.89 | 71.61 | 79.97 | Global MR | 2015 |
| WEBSTER AVENUE | 3 | MORRISON ST E/S | END | \$6,646.23 | 71.61 | 79.97 | Global MR | 2015 |
| WEST HILLS BOULEVARD | 1 | OCEAN BL S/S | LINCOLN BL W/S | \$53,936.88 | 49.33 | 100 | Major Below Critical | 2015 |
| WHITTY STREET | 1 | D ST S/S | END | \$130,463.44 | 15.9 | 100 | Major Below Critical | 2015 |
| YEW AVENUE | 1 | KOOSBAY BL E/S | END | \$59,539.17 | 13.83 | 100 | Major Below Critical | 2015 |
| YEW AVENUE | 2 | KOOSBAY BL E/S | END | \$146,275.89 | 21.94 | 100 | Major Below Critical | 2015 |
| YEW STREET | 1 | 35TH ST W/S | END | \$4,197.62 | 72.57 | 80.81 | Global MR | 2015 |
| ZANNA PLACE | 1 | KENTUCKY AVE S/S | CDS | \$6,093.05 | 66.48 | 100 | Major Above Critical | 2015 |

\$19,625,051.62

## City of Coos Bay

## 5 Year Slurry Seal Budget

## $\underline{2015}$

| Name | Section ID | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 16TH COURT | 1 | THOMPSON RD N/S | END | \$397.50 | 73.64 | 81.76 | Global MR | 2015 |
| 4TH STREET | 6 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | \$13,483.26 | 65.45 | 74.53 | Global MR | 2015 |
| 4TH STREET | 7 | COMMERCIAL AVE N/S | MARKET AVE S/S | \$5,925.43 | 68.5 | 77.22 | Global MR | 2015 |
| CENTRAL AVENUE | 1 | OCEAN BL E/S | 12TH ST E/S | \$10,971.05 | 75.62 | 83.49 | Global MR | 2015 |
| COMMERCIAL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$4,118.12 | 67.49 | 76.33 | Global MR | 2015 |
| COMMERCIAL AVENUE | 2 | BROADWAY ST W/S | 7TH ST W/S | \$34,837.07 | 76.63 | 84.39 | Global MR | 2015 |
| COMMERCIAL AVENUE | 5 | 10TH ST W/S | 11TH ST E/S | \$4,457.32 | 77.65 | 85.29 | Global MR | 2015 |
| ELROD AVENUE | 3 | 4TH ST W/S | 7TH ST E/S | \$13,912.57 | 60.46 | 70.13 | Global MR | 2015 |
| EMPIRE BOULEVARD | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | \$6,678.03 | 76.62 | 84.49 | Global MR | 2015 |
| JOHNSON AVENUE | 6 | 1ST ST E/S | FRONT ST W/S | \$6,413.03 | 77.65 | 85.28 | Global MR | 2015 |
| LAKESHORE DRIVE | 3 | SEABREEZE TER E/S | CROCKER AVE E/S | \$24,417.22 | 66.45 | 75.57 | Global MR | 2015 |
| OCEAN BOULEVARD | 1 | CENTRAL AVE N/S | LINCOLN RD N/S | \$80,358.98 | 77 | 84.76 | Global MR | 2015 |
| SOUTHWEST BOULEVARD | 4 | WASHINGTON AVE S/S | 7TH ST E/S | \$44,024.66 | 73.58 | 81.7 | Global MR | 2015 |

## City of Coos Bay

## 5 Year Slurry Seal Budget

## 2016

| Name | Section |  | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH STREET | 1 | ELROD AVE N/S | CENTRAL AVE S/S | \$25,743.81 | 71.48 | 79.72 | Global MR | 2016 |
| 1STCOURT | 1 | A ST S/S | END | \$1,004.57 | 61.03 | 70.48 | Global MR | 2016 |
| 4TH STREET | 1 | LOCKHART AVE N/S | KRUSE AVE N/S | \$14,355.86 | 75.71 | 83.47 | Global MR | 2016 |
| D STREET | 5 | 1ST AVE E/S | WHITTY ST W/S | \$12,183.59 | 74.72 | 82.6 | Global MR | 2016 |
| MONTGOMERY AVENUE | 5 | MORRISON ST W/S | END | \$4,304.47 | 60.93 | 70.37 | Global MR | 2016 |
| MORRISON STREET | 2 | PIRATES CT S/S | HARRIS AVE N/S | \$17,710.14 | 68.25 | 77 | Global MR | 2016 |
| MORRISON STREET | 6 | MICHIGAN AVE N/S | MONTGOMERY AVE S/S | \$21,115.94 | 75.71 | 83.47 | Global MR | 2016 |
| OCEAN BOULEVARD | 2 | LINCOLN RD N/S | WOODLAND RD W/S | \$93,384.65 | 78.16 | 85.68 | Global MR | 2016 |
| PACIFIC AVENUE | 2 | FILLMORE AVE W/S | MORRISON ST W/S | \$19,364.38 | 71.54 | 79.78 | Global MR | 2016 |
| THOMPSON ROAD | 2 | 15TH CT W/S | KINNEY RD E/S | \$40,134.02 | 74.71 | 82.59 | Global MR | 2016 |

## City of Coos Bay

## 5 Year Slurry Seal Budget

## 2017

| Name | Section ID | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH AVENUE | 2 | E ST S/S | F ST N/S | \$6,991.79 | 61.74 | 70.94 | Global MR | 2017 |
| 15TH STREET | 2 | MYRTLE AVE N/S | END | \$6,132.49 | 65 | 73.84 | Global MR | 2017 |
| 5TH AVENUE | 2 | D ST S/S | E ST N/S | \$6,185.04 | 60.65 | 69.97 | Global MR | 2017 |
| 5TH STREET | 13 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | \$12,302.08 | 61.71 | 70.91 | Global MR | 2017 |
| 6TH STREET | 2 | ANDERSON AVE S/S | BENNETT AVE N/S | \$3,894.63 | 62.73 | 71.81 | Global MR | 2017 |
| 7TH ROAD | 2 | 3RD CT N/S | DATE AVE N/S | \$9,894.21 | 63.83 | 72.79 | Global MR | 2017 |
| 7TH STREET | 4 | ELROD AVE N/S | FERGUSON AVE S/S | \$6,453.96 | 62.74 | 71.82 | Global MR | 2017 |
| BARHAM TERRACE | 1 | PARK RD W/S | CDS | \$3,993.54 | 62.83 | 71.91 | Global MR | 2017 |
| BENNETT AVENUE | 1 | 4TH ST W/S | 6TH ST W/S | \$11,034.78 | 64.99 | 73.83 | Global MR | 2017 |
| ELM STREET | 1 | 7TH RD E/S | END | \$2,169.86 | 64.93 | 73.77 | Global MR | 2017 |
| ELROD AVENUE | 5 | 10TH ST W/S | 12TH ST W/S | \$8,886.55 | 60.62 | 69.94 | Global MR | 2017 |
| JOHNSON AVENUE | 3 | 5TH ST W/S | 7TH ST W/S | \$9,282.20 | 63.83 | 72.79 | Global MR | 2017 |
| LAKESHORE DRIVE | 1 | TAYLOR AVE N/S | CHICKSES DR W/S | \$24,925.62 | 75.8 | 83.54 | Global MR | 2017 |
| LAKESHORE DRIVE | 2 | CHICKSES DR W/S | SEABREEZE TER E/S | \$19,337.14 | 76.9 | 84.52 | Global MR | 2017 |
| LEAF TERRACE | 1 | 28TH CT W/S | END | \$7,347.25 | 63.8 | 75.44 | Global MR | 2017 |
| MYRTLE AVENUE | 4 | JUNIPER AVE E/S | WOODLAND AVE E/S | \$9,693.30 | 62.81 | 71.89 | Global MR | 2017 |
| SANFORD AVENUE | 2 | VIRGINIA AVE S/S | LAKESHORE DR N/S | \$47,081.73 | 61.51 | 70.88 | Global MR | 2017 |
| SCHONEMAN STREET | 2 | NEWMARK AVE S/S | MICHIGAN AVE N/S | \$11,220.24 | 62.74 | 71.82 | Global MR | 2017 |
| SEABREEZE TERRACE | 2 | LAKESHORE DR S/S | LAKEWOOD LN N/S | \$7,875.80 | 63.7 | 72.82 | Global MR | 2017 |
| SEAGATE STREET | 3 | LAKESHORE DR S/S | END SOUTH | \$14,586.31 | 62.6 | 71.84 | Global MR | 2017 |
| THOMPSON ROAD | 3 | KINNEY RD E/S | WOODLAND DR E/S | \$12,796.64 | 75.94 | 83.58 | Global MR | 2017 |
| TVIG TERRACE | 1 | 28TH CT W/S | CDS | \$7,062.88 | 60.3 | 72.59 | Global MR | 2017 |

## City of Coos Bay

## 5 Year Slurry Seal Budget

## $\underline{2018}$

| Branch ID | Name | Section ID <br> From |  | To | Total | Condition Before | Condition After | Work Type | Work <br> Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 13THAV | 13TH AVENUE | 1 | D ST S/S | END | \$4,606.79 | 63.73 | 72.57 | Global MR | 2018 |
| 19THST | 19TH STREET | 3 | JUNIPER AVE S/S | COTTONWOOD AVE S/S | \$5,421.32 | 64.78 | 73.5 | Global MR | 2018 |
| 34THST | 34TH STREET | 1 | LINDBERG AVE S/S | OCEAN BL N/S | \$28,722.33 | 68.2 | 76.56 | Global MR | 2018 |
| 4THAV | 4TH AVENUE | 1 | E ST N/S | D ST S/S | \$6,389.42 | 67.14 | 75.62 | Global MR | 2018 |
| 5THST | 5TH STREET | 12 | BENNETT AVE N/S | ANDERSON AVE S/S | \$5,287.79 | 65.98 | 74.58 | Global MR | 2018 |
| 6THST | 6TH STREET | 3 | BENNETT AVE S/S | ELROD AVE N/S | \$12,338.18 | 65.92 | 74.52 | Global MR | 2018 |
| ARAGAV | ARAGO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$10,245.10 | 67.12 | 75.6 | Global MR | 2018 |
| AUGUAV | AUGUSTINE AVENUE | 1 | END NORTH | LAKESHORE DR N/S | \$36,320.19 | 64.61 | 73.48 | Global MR | 2018 |
| CEDAAV | CEDAR AVENUE | 3 | 16TH AVE W/S | END | \$9,884.57 | 66 | 74.6 | Global MR | 2018 |
| ELROAV | ELROD AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$2,283.37 | 63.71 | 72.55 | Global MR | 2018 |
| FIRST | FIR STREET | 1 | NEWMARK AVE S/S | WALNUT AVE S/S | \$42,412.50 | 68.2 | 76.56 | Global MR | 2018 |
| GARFAV | GARFIELD AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$10,245.10 | 67.06 | 75.54 | Global MR | 2018 |
| INGEAV | INGERSOLL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$5,835.27 | 65.92 | 74.52 | Global MR | 2018 |
| LINDLN | LINDY LANE | 1 | OCEAN BL S/S | END | \$1,301.92 | 70.47 | 78.59 | Global MR | 2018 |
| MARYLAV | MARYLAND AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | \$10,555.56 | 67.06 | 75.54 | Global MR | 2018 |
| MERRST | MERRILL STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | \$15,092.24 | 67.06 | 75.54 | Global MR | 2018 |
| MONTGAV | MONTGOMERY AVENUE | 2 | MARPLE ST E/S | WALL ST W/S | \$5,728.44 | 68.2 | 76.56 | Global MR | 2018 |
| NEWMAV | NEWMARK AVENUE | 5 | MILL ST W/S | END | \$6,526.28 | 67.06 | 75.54 | Global MR | 2018 |
| NOBLAV | NOBLE AVENUE | 1 | CAMMANN ST W/S | WASSON ST E/S | \$5,728.44 | 67.06 | 75.54 | Global MR | 2018 |
| NOBLAV | NOBLE AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST W/S | \$8,512.54 | 64.79 | 73.51 | Global MR | 2018 |
| PARKAV | PARK AVENUE | 2 | 4TH CT W/S | 4TH ST W/S | \$3,838.99 | 64.78 | 73.5 | Global MR | 2018 |
| PINEAV | PINE AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | \$12,378.24 | 65.92 | 74.52 | Global MR | 2018 |

## City of Coos Bay

## 5 Year Slurry Seal Budget

## 2019

| Name | $\begin{gathered} \text { Sectio } \\ \text { ID } \end{gathered}$ | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 19TH STREET | 4 | THOMPSON RD S/S | END | \$15,466.79 | 68.31 | 76.55 | Global MR | 2019 |
| 8TH STREET | 11 | FIR AVE N/S | HEMLOCK AVE S/S | \$6,229.98 | 68.3 | 76.54 | Global MR | 2019 |
| 9TH STREET | 2 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | \$5,307.02 | 68.3 | 76.54 | Global MR | 2019 |
| AUGUSTINE AVENUE | 2 | LAKESHORE DR S/S | END SOUTH | \$15,823.72 | 68.05 | 76.42 | Global MR | 2019 |
| COMPASS CIRCLE | 1 | RADAR RD E/S | CDS | \$5,314.23 | 67.13 | 75.49 | Global MR | 2019 |
| COTTONWOOD AVENUE | 1 | JUNIPER AVE N/S | END | \$35,966.61 | 69.42 | 77.54 | Global MR | 2019 |
| DENISE PLACE | 1 | KENTUCKY AVE N/S | CDS | \$10,700.57 | 67.08 | 75.44 | Global MR | 2019 |
| HIGHLAND AVENUE | 3 | OCEAN BL E/S | 13TH ST E/S | \$6,558.06 | 68.33 | 76.57 | Global MR | 2019 |
| JOHNSON AVENUE | 2 | 4TH ST W/S | 5TH ST E/S | \$9,701.90 | 68.24 | 76.48 | Global MR | 2019 |
| JUNIPER AVENUE | 7 | MYRTLE AVE S/S | 20TH ST E/S | \$12,016.51 | 68.31 | 76.55 | Global MR | 2019 |
| LIMNELL STREET | 1 | FINK ST S/S | END | \$3,374.57 | 67.16 | 75.52 | Global MR | 2019 |
| MARKET AVENUE | 1 | 1ST ST W/S | BROADWAY E/S | \$5,764.90 | 65.92 | 76.49 | Global MR | 2019 |
| MARPLE STREET | 4 | NEWMARK AVE N/S | SCHETTER AVE N/S | \$19,310.06 | 68.25 | 76.49 | Global MR | 2019 |
| MICHIGAN AVENUE | 7 | SCHONEMAN ST E/S | END | \$11,356.74 | 68.25 | 76.49 | Global MR | 2019 |
| OAKWAY COURT | 1 | OAKWAY DR W/S | END | \$2,022.58 | 68.32 | 76.56 | Global MR | 2019 |
| PARK AVENUE | 3 | 4TH ST W/S | BROADWAY ST W/S | \$16,548.39 | 67.07 | 75.43 | Global MR | 2019 |
| SALMON AVENUE | 1 | MORRISON ST E/S | SCHONEMAN ST W/S | \$8,948.39 | 68.3 | 76.54 | Global MR | 2019 |
| TAYLOR AVENUE | 1 | MARPLE ST W/S | WALL ST W/S | \$5,393.55 | 68.05 | 76.42 | Global MR | 2019 |
| WALL STREET | 1 | TAYLOR AVE S/S | HARRIS AVE S/S | \$26,607.21 | 69.25 | 77.49 | Global MR | 2019 |
| WEBSTER AVENUE | 2 | MADISON ST E/S | MORRISON ST W/S | \$11,064.71 | 67.13 | 75.49 | Global MR | 2019 |
| WEBSTER AVENUE | 3 | MORRISON ST E/S | END | \$9,042.13 | 67.13 | 75.49 | Global MR | 2019 |
| YEW STREET | 1 | 35TH ST W/S | END | \$5,710.82 | 68.25 | 76.49 | Global MR | 2019 |

## City of Coos Bay

## 5 Year Recommended Budget

## $\underline{2015}$

| Name | Section ID | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH AVENUE | 2 | E ST S/S | F ST N/S | \$5,994.33 | 64.54 | 73.73 | Global MR | 2015 |
| 10TH STREET | 1 | ELROD AVE N/S | CENTRAL AVE S/S | \$23,836.87 | 72.56 | 80.8 | Global MR | 2015 |
| 12TH COURT | 1 | FERGUSON AVE N/S | END | \$4,507.67 | 60.46 | 70.13 | Global MR | 2015 |
| 13TH AVENUE | 1 | D ST S/S | END | \$3,657.02 | 67.57 | 76.41 | Global MR | 2015 |
| 15TH STREET | 2 | MYRTLE AVE N/S | END | \$5,257.63 | 67.56 | 76.4 | Global MR | 2015 |
| 15TH STREET | 3 | MYRTLE AVE S/S | END | \$7,208.03 | 60.46 | 70.14 | Global MR | 2015 |
| 19TH STREET | 1 | CALIFORNIA AVE S/S | END | \$11,543.46 | 61.38 | 70.94 | Global MR | 2015 |
| 19TH STREET | A | JUNIPER AVE S/S | COTTONWOOD AVE S/S | \$4,303.62 | 68.5 | 77.22 | Global MR | 2015 |
| 1STCOURT | 1 | A ST S/S | END | \$930.15 | 62.52 | 71.95 | Global MR | 2015 |
| 34TH STREET | A | LINDBERG AVE S/S | OCEAN BL N/S | \$22,800.71 | 71.56 | 79.91 | Global MR | 2015 |
| 4TH AVENUE | 1 | E ST N/S | D ST S/S | \$5,072.12 | 70.62 | 79.1 | Global MR | 2015 |
| 4TH STREET | 6 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | \$13,483.26 | 65.45 | 74.53 | Global MR | 2015 |
| 4TH STREET | 7 | COMMERCIAL AVE N/S | MARKET AVE S/S | \$5,925.43 | 68.5 | 77.22 | Global MR | 2015 |
| 5TH AVENUE | 2 | D ST S/S | E ST N/S | \$5,302.68 | 63.53 | 72.85 | Global MR | 2015 |
| 5TH STREET | 12 | BENNETT AVE N/S | ANDERSON AVE S/S | \$4,197.62 | 69.58 | 78.18 | Global MR | 2015 |
| 5TH STREET | 13 | ANDERSON AVE N/S | COMMERCIAL AVE S/S | \$10,547.05 | 64.51 | 73.71 | Global MR | 2015 |
| 6TH STREET | 2 | ANDERSON AVE S/S | BENNETT AVE N/S | \$3,339.02 | 65.45 | 74.53 | Global MR | 2015 |
| 6TH STREET | 3 | BENNETT AVE S/S | ELROD AVE N/S | \$9,794.45 | 69.52 | 78.11 | Global MR | 2015 |
| 7TH ROAD | 2 | 3RD CT N/S | DATE AVE N/S | \$8,482.69 | 66.47 | 75.43 | Global MR | 2015 |
| 7TH STREET | 4 | ELROD AVE N/S | FERGUSON AVE S/S | \$5,533.23 | 65.46 | 74.53 | Global MR | 2015 |
| 9TH STREET | 7 | DATE AVE S/S | END | \$12,521.31 | 62.52 | 71.95 | Global MR | 2015 |
| ARAGO AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$8,132.89 | 70.6 | 79.07 | Global MR | 2015 |
| AUGUSTINE AVENUE | 1 | END NORTH | LAKESHORE DR N/S | \$28,832.14 | 68.48 | 77.35 | Global MR | 2015 |
| BARHAM TERRACE | 1 | PARK RD W/S | CDS | \$3,423.82 | 65.55 | 74.62 | Global MR | 2015 |
| BENNETT AVENUE | 1 | 4TH ST W/S | 6TH ST W/S | \$9,460.55 | 67.55 | 76.39 | Global MR | 2015 |

## City of Coos Bay

## 5 Year Recommended Budget

## $\underline{2015}$

| Name | $\begin{aligned} & \text { Section } \\ & \text { ID } \end{aligned}$ | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CAMMANN STREET | 10 | PACIFIC AVE S/S | END | \$26,235.13 | 62.41 | 71.85 | Global MR | 2015 |
| CEDAR AVENUE | 3 | 16TH AVE W/S | END | \$7,846.69 | 69.6 | 78.2 | Global MR | 2015 |
| COMMERCIAL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$4,118.12 | 67.49 | 76.33 | Global MR | 2015 |
| COMPASS CIRCLE | 1 | RADAR RD E/S | CDS | \$3,906.12 | 71.61 | 79.97 | Global MR | 2015 |
| CROCKER AVENUE | 2 | HOWARD ST N/S | LAKESHORE DR N/S | \$22,260.11 | 61.37 | 71.11 | Global MR | 2015 |
| CROCKER AVENUE | 3 | LAKESHORE DR S/S | END | \$12,799.56 | 62.38 | 72 | Global MR | 2015 |
| DUNN STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | \$10,631.85 | 61.4 | 70.95 | Global MR | 2015 |
| ELM STREET | 1 | 7TH RD E/S | END | \$1,860.31 | 67.49 | 76.33 | Global MR | 2015 |
| ELROD AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$1,812.61 | 67.55 | 76.39 | Global MR | 2015 |
| ELROD AVENUE | 3 | 4TH ST W/S | 7TH ST E/S | \$13,912.57 | 60.46 | 70.13 | Global MR | 2015 |
| ELROD AVENUE | 5 | 10TH ST W/S | 12TH ST W/S | \$7,618.79 | 63.5 | 72.82 | Global MR | 2015 |
| FIR STREET | 1 | NEWMARK AVE S/S | WALNUT AVE S/S | \$33,668.41 | 71.56 | 79.91 | Global MR | 2015 |
| GARFIELD AVENUE | 2 | MORRISON ST W/S | MADISON ST E/S | \$8,132.89 | 70.54 | 79.02 | Global MR | 2015 |
| GOLDEN AVENUE | 1 | 7TH ST E/S | 5TH ST E/S | \$7,632.04 | 62.4 | 71.84 | Global MR | 2015 |
| INGERSOLL AVENUE | 1 | 1ST ST W/S | BROADWAY ST E/S | \$4,632.22 | 69.52 | 78.11 | Global MR | 2015 |
| IVY AVENUE | 1 | BAYSHORE DR W/S | 7TH ST E/S | \$11,471.91 | 62.41 | 71.85 | Global MR | 2015 |
| JOHNSON AVENUE | 3 | 5TH ST W/S | 7TH ST W/S | \$7,957.99 | 66.47 | 75.42 | Global MR | 2015 |
| KNOT TERRACE | 1 | 28TH CT W/S | END | \$6,521.68 | 63.11 | 75.82 | Global MR | 2015 |
| LAKESHORE DRIVE | 3 | SEABREEZE TER E/S | CROCKER AVE E/S | \$24,417.22 | 66.45 | 75.57 | Global MR | 2015 |
| LEAF TERRACE | 1 | 28TH CT W/S | END | \$6,299.08 | 68.23 | 79.87 | Global MR | 2015 |
| LINDBERG AVENUE | 2 | BRULE ST W/S | END | \$9,738.80 | 61.4 | 70.95 | Global MR | 2015 |
| MARKET AVENUE | 3 | 4TH ST W/S | 5TH ST E/S | \$3,847.82 | 60.46 | 70.13 | Global MR | 2015 |
| MARPLE STREET | 2 | PACIFIC AVE N/S | MICHIGAN AVE S/S | \$26,497.48 | 60.38 | 70.06 | Global MR | 2015 |
| MARPLE STREET | 3 | MICHIGAN AVE N/S | NEWMARK AVE S/S | \$13,308.36 | 61.4 | 70.95 | Global MR | 2015 |
| MARPLE STREET | 7 | HARRIS AVE S/S | GRANT AVE N/S | \$9,497.65 | 61.4 | 70.95 | Global MR | 2015 |

## City of Coos Bay

## 5 Year Recommended Budget

## $\underline{2015}$

| Name | Section <br> ID | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MARYLAND AVENUE | 1 | MADISON ST E/S | MORRISON ST W/S | \$8,379.34 | 70.54 | 79.02 | Global MR | 2015 |
| MERRILL STREET | 1 | OCEAN BL N/S | LINDBERG ST S/S | \$11,980.71 | 70.54 | 79.02 | Global MR | 2015 |
| MONTGOMERY AVENUE | 5 | MORRISON ST W/S | END | \$3,985.62 | 62.41 | 71.85 | Global MR | 2015 |
| MORRISON STREET | 2 | PIRATES CT S/S | HARRIS AVE N/S | \$16,398.28 | 69.5 | 78.25 | Global MR | 2015 |
| MYRTLE AVENUE | 4 | JUNIPER AVE E/S | WOODLAND AVE E/S | \$8,310.44 | 65.53 | 74.61 | Global MR | 2015 |
| NEWMARK AVENUE | 5 | MILL ST W/S | END | \$5,180.77 | 70.54 | 79.02 | Global MR | 2015 |
| NOBLE AVENUE | 1 | CAMMANN ST W/S | WASSON ST E/S | \$4,547.42 | 70.54 | 79.02 | Global MR | 2015 |
| NOBLE AVENUE | 6 | MORRISON ST E/S | SCHONEMAN ST W/S | \$6,757.53 | 68.51 | 77.23 | Global MR | 2015 |
| OAKWAY DRIVE | 2 | LINCOLN RD S/S (E) | LINCOLN RD N/S (W) | \$23,516.21 | 60.48 | 70.16 | Global MR | 2015 |
| PACIFIC AVENUE | 2 | FILLMORE AVE W/S | MORRISON ST W/S | \$17,929.99 | 72.62 | 80.86 | Global MR | 2015 |
| PARK AVENUE | 2 | 4TH CT W/S | 4TH ST W/S | \$3,047.51 | 68.5 | 77.22 | Global MR | 2015 |
| PINE AVENUE | 1 | BAYSHORE DR W/S | 8TH ST E/S | \$9,826.25 | 69.52 | 78.12 | Global MR | 2015 |
| SANFORD AVENUE | 2 | VIRGINIA AVE S/S | LAKESHORE DR N/S | \$40,365.00 | 64.42 | 73.78 | Global MR | 2015 |
| SCHONEMAN STREET | 2 | NEWMARK AVE S/S | MICHIGAN AVE N/S | \$9,619.55 | 65.46 | 74.54 | Global MR | 2015 |
| SEABREEZE TERRACE | 2 | LAKESHORE DR S/S | LAKEWOOD LN N/S | \$6,752.23 | 66.45 | 75.57 | Global MR | 2015 |
| SEAGATE STREET | 3 | LAKESHORE DR S/S | END SOUTH | \$12,505.41 | 65.43 | 74.68 | Global MR | 2015 |
| SOUTHWEST BOULEVARD | 4 | WASHINGTON AVE S/S | 7TH ST E/S | \$44,024.66 | 73.58 | 81.7 | Global MR | 2015 |
| TWIG TERRACE | 1 | 28TH CT W/S | CDS | \$6,055.28 | 65.16 | 77.44 | Global MR | 2015 |

## City of Coos Bay

## 5 Year Recommended Budget

## $\underline{2016}$

| Name | $\begin{gathered} \text { Sectiol } \\ \text { ID } \end{gathered}$ | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12TH AVENUE | 2 | F ST N/S | E ST S/S | \$15,492.11 | 63.13 | 100 | Major Above Critical | 2016 |
| 13TH STREET | 1 | JUNIPER AVE S/S | HEMLOCK AVE S/S | \$16,356.60 | 63.04 | 100 | Major Above Critical | 2016 |
| 14TH STREET | 1 | JUNIPER AVE N/S | MYRTLE AVE S/S | \$15,884.18 | 72.6 | 80.72 | Global MR | 2016 |
| 16TH COURT | 1 | THOMPSON RD N/S | END | \$429.30 | 72.6 | 80.72 | Global MR | 2016 |
| 17TH STREET | 3 | I ST N/S | EVERGREEN ST N/S | \$47,985.60 | 62.08 | 100 | Major Above Critical | 2016 |
| 19TH STREET | 4 | THOMPSON RD S/S | END | \$12,278.04 | 71.55 | 79.79 | Global MR | 2016 |
| 4TH COURT | 2 | PARK AVE N/S | 205' N/O PARK AVE | \$4,710.53 | 64.09 | 100 | Major Above Critical | 2016 |
| 6TH STREET | 6 | KOOSBAY BL N/S | KINGWOOD AVE S/S | \$19,724.13 | 63.04 | 100 | Major Above Critical | 2016 |
| 6TH STREET | 7 | KINGWOOD AVE N/S | MYRTLE AVE S/S | \$17,010.24 | 64.09 | 100 | Major Above Critical | 2016 |
| 7TH AVENUE | 2 | E ST N/S | D ST S/S | \$7,469.86 | 72.61 | 80.73 | Global MR | 2016 |
| 7TH STREET | 5 | FERGUSON AVE S/S | HALL ST N/S | \$19,310.01 | 72.54 | 80.66 | Global MR | 2016 |
| 8TH STREET | 9 | JOHNSON AVE S/S | END | \$1,874.52 | 69.43 | 100 | Major Above Critical | 2016 |
| 8TH STREET | 11 | COMMERCIAL AVE N/S | 8TH TERR N/S | \$4,945.56 | 71.54 | 79.78 | Global MR | 2016 |
| 9TH AVENUE | 1 | E ST N/S | D ST S/S | \$23,238.17 | 63.13 | 100 | Major Above Critical | 2016 |
| 9TH STREET | 2 | COMMERCIAL AVE S/S | CENTRAL AVE N/S | \$4,212.88 | 71.54 | 79.78 | Global MR | 2016 |
| AUGUSTINE AVENUE | 2 | LAKESHORE DR S/S | END SOUTH | \$12,561.38 | 71.43 | 79.8 | Global MR | 2016 |
| COMMERCIAL AVENUE | 3 | 7TH ST W/S | 8TH ST W/S | \$3,592.54 | 68.32 | 100 | Major Above Critical | 2016 |
| COTTONWOOD AVENUE | 1 | JUNIPER AVE N/S | END | \$28,551.45 | 72.54 | 80.66 | Global MR | 2016 |
| CROCKER AVENUE | 1 | ST JOHN N/S | HOWARD ST N/S | \$9,416.03 | 72.48 | 80.73 | Global MR | 2016 |
| DENISE PLACE | 1 | KENTUCKY AVE N/S | CDS | \$8,494.46 | 70.43 | 78.79 | Global MR | 2016 |
| D STREET | 1 | HARBORVIEW DR W/S | COOS RIVER HWY E/S | \$20,162.89 | 61.02 | 100 | Major Above Critical | 2016 |
| EVERGREEN DRIVE | 1 | TIMBERLINE DR E/S | TIMBERLINE DR S/S | \$43,244.75 | 61.01 | 100 | Major Above Critical | 2016 |
| FILBERT AVENUE | 2 | 18TH AVE E/S | END | \$11,782.91 | 72.61 | 80.73 | Global MR | 2016 |
| FINK STREET | 1 | WHITTY ST W/S | BESSIE ST E/S | \$23,250.17 | 61.03 | 100 | Major Above Critical | 2016 |
| FIR AVENUE | 2 | 7TH CT W/S | 4TH ST W/S | \$20,205.21 | 63.04 | 100 | Major Above Critical | 2016 |
| GOLDEN AVENUE | 3 | 4TH ST E/S | BROADWAY ST W/S | \$68,644.58 | 60.92 | 100 | Major Above Critical | 2016 |
| HIGHLAND AVENUE | 3 | OCEAN BL E/S | 13TH ST E/S | \$5,206.00 | 71.57 | 79.81 | Global MR | 2016 |
| INGERSOLL AVENUE | 7 | 10TH ST E/S | 11TH ST W/S | \$8,113.81 | 72.54 | 80.66 | Global MR | 2016 |

## City of Coos Bay

## 5 Year Recommended Budget

## 2016

| Name | Section ID | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| JOHNSON AVENUE | 2 | 4TH ST W/S | 5TH ST E/S | \$7,701.68 | 71.48 | 79.72 | Global MR | 2016 |
| JUNIPER AVENUE | 5 | 14TH ST W/S | 13TH ST E/S | \$7,137.86 | 72.54 | 80.66 | Global MR | 2016 |
| JUNIPER AVENUE | 7 | MYRTLE AVE S/S | 20TH ST E/S | \$9,539.09 | 71.55 | 79.79 | Global MR | 2016 |
| KENTUCKY AVENUE | 3 | MORRISON ST E/S | 125' W/O TRICIA PL | \$5,426.38 | 72.54 | 80.67 | Global MR | 2016 |
| KOOSBAY BOULEVARD | 1 | BAYSHORE DR W/S | 10TH ST E/S | \$7,911.97 | 69.37 | 100 | Major Above Critical | 2016 |
| KOOSBAY BOULEVARD | 2 | 10TH ST E/S | TEAKWOOD AVE S/S | \$22,779.75 | 68.38 | 100 | Major Above Critical | 2016 |
| LIMNELL STREET | 1 | FINK ST S/S | END | \$2,678.84 | 70.51 | 78.87 | Global MR | 2016 |
| LINDY LANE | 1 | OCEAN BL S/S | END | \$1,116.19 | 72.54 | 80.67 | Global MR | 2016 |
| MAIN STREET | 1 | SCHETTER AVE N/S | NEWMARK AVE N/S | \$22,818.61 | 64.09 | 100 | Major Above Critical | 2016 |
| MARKET AVENUE | 1 | 1ST ST W/S | BROADWAY E/S | \$4,576.36 | 71.49 | 82.07 | Global MR | 2016 |
| MARPLE STREET | 4 | NEWMARK AVE N/S | SCHETTER AVE N/S | \$15,328.95 | 71.49 | 79.73 | Global MR | 2016 |
| MICHIGAN AVENUE | 4 | CAMMANN ST E/S | MADISON ST E/S | \$39,966.50 | 61.99 | 100 | Major Above Critical | 2016 |
| MICHIGAN AVENUE | 7 | SCHONEMAN ST E/S | END | \$9,015.34 | 71.49 | 79.73 | Global MR | 2016 |
| MONTGOMERY AVENUE | 2 | MARPLE ST E/S | WALL ST W/S | \$4,911.22 | 70.43 | 78.79 | Global MR | 2016 |
| MYRTLE AVENUE | 3 | 14TH ST E/S | END | \$13,587.66 | 63.11 | 100 | Major Above Critical | 2016 |
| OAKWAY COURT | 1 | OAKWAY DR W/S | END | \$1,605.59 | 71.56 | 79.8 | Global MR | 2016 |
| PARK AVENUE | 3 | 4TH ST W/S | BROADWAY ST W/S | \$13,136.64 | 70.42 | 78.78 | Global MR | 2016 |
| SALMON AVENUE | 1 | MORRISON ST E/S | SCHONEMAN ST W/S | \$7,103.52 | 71.54 | 79.78 | Global MR | 2016 |
| SHON-STA WAY | 1 | CANYON DR E/S | END | \$9,075.79 | 63.14 | 100 | Major Above Critical | 2016 |
| TAYLOR AVENUE | 1 | MARPLE ST W/S | WALL ST W/S | \$4,281.57 | 71.43 | 79.8 | Global MR | 2016 |
| WALL STREET | 1 | TAYLOR AVE S/S | HARRIS AVE S/S | \$21,121.66 | 72.49 | 80.73 | Global MR | 2016 |
| WALL STREET | 6 | PACIFIC AVE S/S | FULTON AVE N/S | \$18,983.74 | 72.54 | 80.67 | Global MR | 2016 |
| WASSON STREET | 2 | HARRIS AVE N/S | SCHETTER AVE S/S | \$5,371.33 | 69.31 | 100 | Major Above Critical | 2016 |
| WEBSTER AVENUE | 2 | MADISON ST E/S | MORRISON ST W/S | \$8,783.52 | 70.49 | 78.85 | Global MR | 2016 |
| WEBSTER AVENUE | 3 | MORRISON ST E/S | END | \$7,177.93 | 70.49 | 78.85 | Global MR | 2016 |
| YEW STREET | 1 | 35TH ST W/S | END | \$4,533.43 | 71.49 | 79.73 | Global MR | 2016 |

## City of Coos Bay

5 Year Recommended Budget
$\underline{2017}$

\$746,388.42

## City of Coos Bay

## 5 Year Recommended Budget

## 2018

| Name | Section ID | From | To | Total | Avg Of Condition Before | Avg Of Condition After | Work Type | Work Year |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10TH STREET | 7 | JOHNSON AVE N/S | SOUTHWEST BL N/S | \$142,427.53 | 46.6 | 100 | Major Below Critical | 2018 |
| 10TH STREET | 9 | INGERSOLL AVE S/S | JOHNSON AVE N/S | \$52,301.26 | 46.71 | 100 | Major Below Critical | 2018 |
| 7TH STREET | 9 | KRUSE AVE N/S | LOCKHART AVE N/S | \$79,152.35 | 45.47 | 100 | Major Below Critical | 2018 |
| CANYON DRIVE | 2 | SHONSTA WY N/S | CANYON TERR S/S | \$32,913.26 | 56.94 | 100 | Major Below Critical | 2018 |
| CENTRAL AVENUE | 2 | 12TH ST E/S | 10TH ST W/S | \$142,831.73 | 36.38 | 100 | Major Below Critical | 2018 |
| D STREET | 2 | 6TH AVE W/S | 5TH AVE W/S | \$34,794.62 | 55.8 | 100 | Major Below Critical | 2018 |
| JUNIPER AVENUE | 3 | COTTONWODD AVE E/S | BUTLER RD W/S | \$1,190.08 | 69.33 | 100 | Major Above Critical | 2018 |
| OAKWAY DRIVE | 1 | WEST HILLS BL S/S | LINCOLN RD N/S | \$2,364.28 | 69.4 | 100 | Major Above Critical | 2018 |
| SOUTHWEST BOULEVARD | 3 | MONTANA AVE S/S | WASHINGTON AVE S/S | \$249,291.53 | 39.78 | 100 | Major Below Critical | 2018 |
| TAYLOR AVENUE | 3 | WASSON ST E/S | CAMMANN ST W/S | \$1,448.35 | 69.33 | 100 | Major Above Critical | 2018 |

## City of Coos Bay

5 Year Recommended Budget

## $\underline{2019}$



ヘnnal $n$
Historicaı

Oregon Historic Sites Search Results List

| Property Name | Address/Location | City | County | Yr Built | Elig | NR Stat |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Cape Arago Lighthouse | Gregory Point | Coos Bay vcty | Coos | 1934 | ES | NRI |
| Olsson, Capt Bror W, House | 631 S 10th | Coos Bay | Coos | 1913 | ES | NRI |
| Seelig-Byler House | 1920 N 14th St | Coos Bay | Coos | 1909 | ES | NRI |
| Marshfield Elks Temple | 195 S 2nd St | Coos Bay | Coos | 1920 | ES | NRI |
| Nasburg-Lockhart House | 687 N 3rd St | Coos Bay | Coos | 1884 | ES | NRI |
| Nerdrum, Hjalte, House | 955 S 5th St | Coos Bay | Coos | 1912 | ES | NRI |
| Nerdrum-Conrad House | 979 S 5th St | Coos Bay | Coos | 1912 | ES | NRI |
| Marshfield IOOF Cemetery | 750 7th St | Coos Bay | Coos | 1888 | ES | NRI |
| Egyptian Theatre | 229 S Broadway St | Coos Bay | Coos | 1925 | ES | NRI |
| Koski Building | 241 N Broadway St | Coos Bay | Coos | 1926 | ES | NRI |
| Marshfield Hotel | 275 N Broadway St | Coos Bay | Coos | 1925 | ES | NRI |
| Hub Department Store Building | 125 Central Ave | Coos Bay | Coos | 1914 | ES | NRI |
| Coke, J S, Building | 150 Central Ave | Coos Bay | Coos | 1910 | ES | NRI |
| Chandler Hotel \& Annex | 187 W Central Ave | Coos Bay | Coos | 1909 | ES | NRI |
| Coos Bay National Bank Building | 201 W Central Ave | Coos Bay | Coos | 1923 | ES | NRI |
| Marshfield City Hall | 375 W Central Ave | Coos Bay | Coos | 1923 | ES | NRI |
| Myrtle Arms Apartment Building | 613 W Central Ave | Coos Bay | Coos | 1914 | ES | NRI |
| Marshfield Sun Printing Plant | 1049 N Front St | Coos Bay | Coos | 1895 | ES | NRB |
| Coos Bay Carnegie Library | 515 W Market St | Coos Bay | Coos | 1914 | ES | NRI |
| Tower-Flanagan House | 476 Newmark Ave | Coos Bay | Coos | 1872 | ES | NRI |
| Tower, Major Morton, House | 486 Schetter Ave | Coos Bay | Coos | 1869 | ES | NRI |
| Tribal Hall Of The Confederated Tribes Of Coos, Lower Umpqua \& + | 338 Wallace St | Coos Bay | Coos | 1940 | ES | NRI |

22 Records Found

| Property Name | Address/Location | City | County | Yr Built | Elig | NR Stat |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (35-CS-130) The Osprey Site | ADDRESS RESTRICTED | North Bend | Coos |  | ES | NRI |
| (35-CS-24) Archeological Site | ADDRESS RESTRICTED | North Bend vcty | Coos |  | ES | NRI |
| Coos Bay Bridge | Hwy 101 | North Bend | Coos | 1936 | ES | NRI |
| Hotel North Bend | 768 Virginia Ave | North Bend | Coos | 1922 | ES | NRI |

4 Records Found

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$ 。
VOLUME 2

Technical Memorandum \#5:
Methodology Memorandum

## METHODOLOGY MEMORANDUM

Date: November 14, 2018
To: Peter Schuytema, PE, ODOT TPAU
From: Angela Rogge, PE, David Evans and Associates, Inc. Sepehr Dastegheibi, David Evans and Associates, Inc.

Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
This memorandum summarizes the approach for collection and evaluation of information that the Cities of Coos Bay and North Bend Transportation System Plan (TSP) Update will use for traffic analysis purposes.

## Study Area

The Project includes two distinct study areas; the City of Coos Bay and the City of North Bend. The cities are located in Coos County, Oregon on the Pacific Ocean. The City of North Bend is surrounded on three sides by Coos Bay, an S-shaped water inlet and estuary where the Coos River enters Coos Bay. Together, they are referred to as one entity called either Coos Bay/North Bend or the Bay Area. The study area is the boundary for the Project, which includes, at a minimum, City Limits, Urban Growth Boundary ("UGB") and urban reserves.

## Volume Development

## Study Area Intersections

The TSP includes 54 locations for analysis, 26 locations in North Bend and 28 locations in Coos Bay. Since much of the analysis documentation will review both cities concurrently, the intersections are numbered sequentially from 1 to 54 to avoid potential for accidental overlap. The City of North Bend intersections are summarized in Table 1 and the City of Coos Bay intersections in Table 2.

## Traffic Data Collection

The transportation and traffic analysis will be based on existing year 2017 conditions for the design hour ( $30^{\text {th }}$ highest) volumes.

ODOT provided the traffic counts for the purpose of analysis:

- 4-hour PM peak turning movement counts, including bicycles and pedestrians, with 15 minute breakdowns between 2:00 PM and 6:00 PM - 41 locations
- 16-hour turning movement counts, including bicycles and pedestrians with 15 minute breakdowns from 6:00 AM to 10:00 PM - 13 locations

The majority of the traffic counts were collected in the year 2017. There were 3 intersections collected in 2016, which will need to be grown to year 2017.

Table 1. Summary of Traffic Counts (City of North Bend)

| ID | Count Location | Duration | Date |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1}$ | Arthur St at Colorado Lp | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2}$ | Oak St/W Airport Way at Colorado Ave/Maple Leaf | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{3}$ | Maple Leaf at E Airport Way | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{4}$ | US 101 at Florida Ave | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{5}$ | Virginia Ave at Arthur St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{6}$ | Virginia Ave at Oak St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{7}$ | Virginia Ave at Maple St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{8}$ | Virginia Ave at Broadway St | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{9}$ | Virginia Ave at Pony Village Main Driveway | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 0}$ | Virginia Ave at Harrison Ave | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 1}$ | Virginia Ave at Meade Ave | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 2}$ | Virginia Ave at US 101 South | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{1 3}$ | Virginia Ave at US 101 North | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{1 4}$ | Marion Ave at Safeway Driveway | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 5}$ | Washington Ave at US 101 South/Sherman Ave | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{1 6}$ | Pony Creek Rd at Crowell Ln | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 7}$ | Oak St at 16th/17th St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 8}$ | Broadway St at 16th St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{1 9}$ | Broadway Ave at 17th St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2 0}$ | US 101 at Mill Casino Entrance | 16 hr | $4 / 22 / 2016$ |
| $\mathbf{2 1}$ | Newmark Ave at Oak St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2 2}$ | Broadway St at Newmark Ave | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{2 3}$ | Newmark St at Edgewood Dr | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2 4}$ | Newmark Ave at Brusells St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2 5}$ | Newmark St at Sherman Ave | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{2 6}$ | US 101 at Newmark St | 4 hr | $4 / 22 / 2016$ |
|  |  |  |  |

Table 2. Summary of Traffic Counts (City of Coos Bay)

| ID | Count Location | Duration | Date |
| :--- | :--- | :--- | :--- |
| $\mathbf{2 7}$ | Morrison St at Lakeshore Dr | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2 8}$ | Newmark Ave at Cape Arago Hwy/Empire Blvd | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{2 9}$ | Newmark Ave at Morrison St | 16 hr | $5 / 10 / 2016$ |


| ID | Count Location | Duration | Date |
| :--- | :--- | :--- | :--- |
| $\mathbf{3 0}$ | Newmark Ave at Ocean Blvd | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{3 1}$ | Newmark Ave at Laclair St | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{3 2}$ | Empire Blvd at Pacific Ave | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{3 3}$ | Thompson Rd at Woodland Dr | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{3 4}$ | Koosbay Blvd at Thompson Rd | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{3 5}$ | Ocean Blvd at Woodland Dr | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{3 6}$ | Ocean Blvd at Butler Rd | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{3 7}$ | Koosbay Blvd at 10th St | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{3 8}$ | Us 101 at Koosbay Blvd | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{3 9}$ | 7th St at Commercial Ave | 4 hr | $9 / 12 / 2017$ |
| $\mathbf{4 0}$ | Commercial Ave at US 101 South | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{4 1}$ | Commercial Ave at US 101 North | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 2}$ | 10th St at Central Ave | 16 hr | $7 / 11 / 2017$ |
| $\mathbf{4 3}$ | Central Ave at 7th St | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 4}$ | 7th St at Anderson Ave | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 5}$ | Elrod Ave at 10th St | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 6}$ | 11th St at Ingersoll Ave | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 7}$ | 7th St at Ingersoll Ave | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 8}$ | Hall Ave at US 101 South | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{4 9}$ | Hall Ave at US 101 North | 4 hr | $7 / 12 / 2017$ |
| $\mathbf{5 0}$ | Johnson Ave at US 101 South | 4 hr | $7 / 11 / 2017$ |
| $\mathbf{5 1}$ | Johnson Ave at US 101 North | $7 / 11 / 2017$ |  |
| $\mathbf{5 2}$ | 7th St at Lockhart Ave/Southwest Blvd | $7 / 12 / 2017$ |  |
| $\mathbf{5 3}$ | 6th Ave at D St / Coos River Hwy | 7 hr | $7 / 12 / 2017$ |
| $\mathbf{5 4}$ | Coos River Rd at Ross Inlet Rd | $7 / 12 / 2017$ |  |
|  |  | 4 | 7 |

## Design Hour ( $30^{\text {th }}$ Highest) Volumes

Data for existing weekday counts will be reviewed to determine which hour is the highest traffic demand hour for the study area. Turning movements, peak hour factors, vehicle classification, and other data describing demand in the study area will be derived for this peak hour for all intersections.

## ADT / K-Factor

The K-factor is the percent of ADT in the peak hour. A K-factor will be used to develop an estimate for ADT along roadway segments and intersections for the purpose of calculating crash rates. As no 24 -hour counts were collected, the average K-factor developed from the 16-hour counts (see Table 1 and Table 2 for list of these intersection locations). The ODOT Transportation Planning and Analysis Unit's (TPAU) Analysis Procedures Manual (APM) Volume 2 suggests an expansion factor or 1.10 for 16-hour counts.

Two K-factors will be developed: one for use at intersections with state facilities and the other for local intersections.

## Inventory of Existing Facilities

The transportation system inventory is a citywide inventory of the unique modal networks (e.g., street, bicycle and pedestrian facilities, transit, rail, marine and air).

## Traffic Volumes

Traffic volumes will be developed for two study periods: existing year 2017 and future year 2040. The forecast year is compliant with the 20 -year forecast requirement of Transportation Planning Rule (TPR) and allows for easier data sharing between upcoming projects in the region.

## Existing Volumes

The existing PM peak hour volumes will be determined from the existing weekday counts and adjusted to design hourly volumes following the methodologies outlined in the ODOT TPAU APM, Volume 2.

## Peak Hour Selection

A single system peak hour will be used for analysis purposes. Traffic counts will be reviewed in 15minute intervals to determine the true peak hour for the entire study area. The final selection of a peak hour will be based on a simple majority of counts that have the same peak hour, with emphasis given to arterials.

## Adjustment to Baseline Analysis Year

The project base year is 2017 but three of the counts were counted in 2016. The Future Volume Table is used to adjust the counts to the base year. The intersections of US 101 at Mill Casino Entrance, US 101 at Newmark Avenue and Newmark Avenue at Morrison Street were counted in 2016. Sections of Newmark Avenue are also known as the Cape Arago Highway (Oregon highway 240) and US 101 is Highway 009.

Assuming linear growth in the future, the annual growth factor was calculated based on the 21-year growth factor from ODOT's 2036 Future Volume Table. Table 3 summarizes the growth factor calculation.

Table 3. Annual Growth Factor

| Hwy No. | Description | 2015 | 2036 | 1 Year Growth Factor |
| :---: | :--- | :---: | :---: | :---: | :---: |
| $\mathbf{2 4 0}$ | 0.02 mile east of Fir Street | 16100 | 16400 | 1.001 |
| $\mathbf{2 4 0}$ | South city limits of Coos Bay | 7900 | 8100 | 1.001 |
| $\mathbf{0 0 9}$ | 0.01 mile south of Sheridan Avenue | 13500 | 15200 | 1.006 |
| $\mathbf{0 0 9}$ | South city limits of North Bend, north <br> city limits of Coos Bay | 19800 | $\mathbf{2 4 3 0 0}$ | 1.011 |
|  | Newmark Ave at Morrison St |  | 1.001 |  |
|  | US 101 at Mill Casino Entrance, US 101 at Newmark St |  |  |  |

## Seasonal Adjustment Factors

Since traffic counts were taken during various times of the year, data from varying months will need to be converted to peak month equivalents using calculated seasonal adjustment factors. TPAU has three methods for developing seasonal factors: On-Site ATR Method, ATR Characteristic Table Method, and ATR Seasonal Trend Table Method. To accommodate the varying road types within the study area, different methods were used to develop seasonal factors for US 101, District Highways and local streets.

There are no ATRs in the study area; the closest ATR is south of Coos Bay. For local system traffic, the seasonal trend table will be applied to identify a seasonal adjustment for the commuter trend.

Seasonal factors were calculated for the count months of April, May, July and September. Existing traffic volumes will be multiplied by their appropriate seasonal factor to determine the $30^{\text {th }}$ highest hour volumes.

## US 101

There are no ATR locations along US 101 in close proximity to the study area that have similar characteristics to US 101 through the study area. To develop seasonal factors, both the ATR Characteristic Table Method and Seasonal Trend table were considered as viable methods. Based on the characteristics of US 101 through the study area and AADTs within 10\% of the study area US 101 volumes, the following methods were selected:

- ATR 06-009 (Coos Bay): For locations along US 101 where the ADT is less than 16,000 vpd (10 intersections)
- ATR 21-009 (North Newport): For locations along US 101 where the ADT is between 16,000 and 20,400 vpd (two intersections)
- Seasonal Trend for Coastal Destination: For locations along US 101 where the ADT exceeds 20,400 vpd (one intersection)


## Cape Arago Highway

To develop seasonal factors for study area intersections on Cape Arago Highway, the Seasonal Trend Table was used to apply an average of the coastal destination and commuter trends. These factors will be applied to 13 study area intersections.

## Allegany Highway

To develop seasonal factors for the two study area intersections on Allegany, the Seasonal Trend Method was used for the average of the summer and commuter trends.

## Local Traffic

The seasonal factors for traffic moving within the local street network were calculated based on the count date using the Seasonal Trend Method for a commuter route. These factors will be applied to 26 study area intersections.

Table 4. Seasonal Factors

| Location / Seasonal Adjustment | April | May | July | September |
| ---: | :---: | :---: | :---: | :---: | :---: |
| US 101 | 1.18 | -- | 1.01 | 1.08 |


| Location / Seasonal Adjustment | April | May | July | September |
| :---: | :---: | :---: | :---: | :---: |
| ATR 06-009 |  |  |  |  |
| $\begin{array}{r} \text { US } 101 \\ 16,000 \mathrm{vpd} \text { < ADT < } 20,400 \mathrm{vpd} \\ \text { ATR } 21-009 \end{array}$ | 1.30 | -- | -- | -- |
| US 101 $A D T \geq 20,400$ vpd Coastal Destination Trend | -- | -- | 1.02 |  |
| Cape Arago Hwy Coastal Destination / Commuter Trend | -- | 1.15 | 1.02 | -- |
| Allegany Hwy Commuter/ Summer Trend | -- | -- | 1.01 | -- |
| Local Traffic Commuter Trend | -- | -- | 1.01 | 1.03 |

## Balancing

After the seasonal factors are applied, the volumes are input into Synchro and balanced accordingly. For conservative analysis, it is preferable to add traffic to the system instead of remove. This approach is taken whenever possible. Volume imbalances between intersections are managed to represent the volumes into and out of residential developments and commercial lots between study area intersections, whenever applicable.

## Future Design Year 2040 Volumes

The future baseline volumes will be developed from existing turning movement volumes and postprocessing travel demand forecasting output from the Coos Bay/North Bend model to acquire 2040 volume output.

The post-processing procedures will follow APM and NCHRP Report 255 and 765 guidelines. To convert model volumes to design hour volumes, the two most commonly used methods are the growth method and the difference method.

Both methods will be compared in a spreadsheet and if the difference in values between the two methods is greater than 10 percent, then the value from the difference method will be used, otherwise the values from the methods will be averaged. The forecasted link volumes will reference the NCHRP Report 765 spreadsheet to determine the year 2040 turning movement volumes and the volumes will be rounded to the nearest five vehicles and balanced in Synchro.

## Evaluation Comparison Tools

Tools and techniques used to evaluate and compare the alternatives include traffic operations analysis tools for more detailed assessment of area conditions. Due to the potential latent demand shifts, the future baseline model volumes will be compared with the alternative model volumes and adjustment factors created and used as needed.

## Traffic Mobility Targets

## Cities of North Bend and Coos Bay

Coos Bay Municipal Code states "City streets shall maintain a LOS of "D" during the p.m. peak hour of the day."

The North Bend Municipal Code states "City streets shall maintain a LOS of "D," as defined by the Highway Capacity Manual (2000 Edition), during the p.m. peak hour of the day. A lesser standard may be accepted for local street intersections or driveway access points that intersect with collector or arterial streets, if alternative signalized access is available and these intersections are found to operate safely.

## Coos County

None of the TSP study area intersections are under Coos County jurisdiction; all of the study are intersections are within the North Bend and Coos Bay city limits.

## State of Oregon

For State facilities, the Oregon Highway Plan (OHP) and the Highway Design Manual (HDM) will be used in the assessment of intersection operations. Both documents base their mobility performance on the calculation of $\mathrm{V} / \mathrm{C}$; however, the standards in the HDM are based on higher performance levels than those in the OHP. The mobility targets from the OHP will be applied to the existing and future baseline (no build) analysis while the standards from the HDM will be applied to the evaluation of design alternatives.

Table 5. Applicable Performance Measures

| State Highways |  | Volume-to-Capacity Ratio |  |
| :---: | :---: | :---: | :---: |
|  |  | OHP ${ }^{1}$ | HDM ${ }^{2}$ |
| US 101 | Non-MPO, Outside STAs, $\leq 35 \mathrm{mph}$ | 0.85 | 0.70 |
| (Freight Route on a Statewide Highway) | Non-MPO, $\geq 45 \mathrm{mph}$ | 0.80 | 0.70 |
| Cape Arago Highway (District Highway) | Non-MPO, Outside STAs, $\leq 35 \mathrm{mph}$ | 0.95 | 0.80 |
| Local Interest Roads | Non-MPO, Outside STAs, $\leq 35 \mathrm{mph}$ | 0.95 | 0.80 |
| (Unsignalized, intersects State facility) | Non-MPO, Outside STAs, $\geq 45 \mathrm{mph}$ | 0.90 | 0.75 |
| City Streets |  | Level of Service ${ }^{1,2}$ |  |
| City of Coos Bay |  | LOS D |  |
| City of North Bend |  | LOS D |  |

Notes:

1. Table 6: Volume to Capacity Ratio Targets Outside Metro, Oregon Highway Plan, 1999.
2. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012
3. Coos Bay Municipal Code, Section 18.12.005.
4. North Bend Municipal Code, Section 10.12.060.

## Arterial and Intersection Operations

The operational analysis will evaluate volume-to-capacity (v/c) ratios and level of service (LOS) using the Synchro program (version 10). The files will also be saved in a compatible version for ODOT review. Throughout the analysis process, TPAU and Region 3 Traffic staff will review modeling assumptions, analysis settings, and other assumptions to help ensure consistency of data with other studies under way.

An assessment of adding or removing traffic signals may be needed. Any assessments of new traffic signals will use ODOT's preliminary signal warrant spreadsheets for ODOT facilities and MUTCD warrants for City facilities. Operational analysis results will be compared with applicable mobility standards and specific recommendations for mitigation improvements will be reviewed by the agency with jurisdiction.

## Traffic Operations Analysis Procedures

All analysis volumes must be adjusted to the 30th highest hour. Consultant shall use traffic analysis software programs following HCM 6 procedures and must be consistent with TPAU's analysis procedures. As outlined in the scope, signalized intersections must use HCM 2000 methods for obtaining intersection volume-to-capacity ratios unless software can provide HCM 6 intersection v/c ratios. Consultant shall obtain signal timing from ODOT Region 3 Traffic Section.

Consultant shall:

- Coordinate all analysis with TPAU and ODOT Region 3 Traffic Section
- Get approval of existing and future analysis methodology from TPAU and ODOT Region 3 Traffic Section via a Methodology Memorandum prior to beginning analysis
- Obtain approval of analysis and conclusions from TPAU and ODOT Region 3 Traffic Section prior to submitting draft technical memorandums
- Compare traffic operations with OHP v/c and HCM LOS targets.
- Use inputs specified by TPAU for lane capacity, signal timing, etc.
- Evaluate failing, unsignalized intersections using ODOT's ADT-based preliminary signal warrants and the Manual on Uniform Traffic Control Devices (MUTCD Warrant 1).


## Bicycle, Pedestrian and Transit Evaluation

Consultant shall analyze transit, bicycle and pedestrian operations in the study area using the Level of Traffic Stress ("LTS") for bicycles and pedestrians and the qualitative multimodal assessment ("QMA") for transit as outlined in the Agency's Analysis Procedure Manual, Chapter 14. Average widths are acceptable; block by block analysis detail is not necessary. Analysis must also identify safety concerns and barriers such as system gaps or challenging topography. Transit analysis must use as much general or average data available from Coos County Area Transit as possible.

Consultant shall analyze bicycle and pedestrian movements for all count locations as provided in the traffic counts. Analysis must include:

- Volume
- Type
- Direction


## Crash History Analysis

Crash data for this project will be obtained from the ODOT Crash Analysis and Reporting Unit for the most recent five complete years. The most recent Safety Priority Index System ("SPIS") data will be obtained as well for the top $10 \%$ of SPIS sites. Data will be requested for study area intersections and both state and non-state arterials and collectors with the City Limits of Coos Bay and North Bend.

The study area evaluation will include an analysis of the most recent five-year crash history on state and non-state roadways at count locations and arterial and collector segments between count locations. This analysis screens for patterns amongst the crashes that are indicative of existing geometric or operational deficiencies. Intersection crash rates will be calculated for each study area intersection and compared against the published $90^{\text {th }}$ Percentile rates in the APM (Version 2). Segment crash rates shall be compared with the ODOT Crash Rate Table II.

The Highway Safety Manual Part B Network Critical Crash Rate and Screening Probability of Specific Crash Types Exceeding Threshold Proportions method will be used in the screening process where sufficient reference populations are available. Based on the crash patterns, the analysis may identify improvements for the build alternatives that could mitigate safety issues.

During the analysis of future alternatives, for each strategy developed to specifically address a safety concern, Consultant shall analyze safety impacts of each design. Any potential countermeasures shall be initially identified from the ODOT ARTS Crash Reduction Factors (CRF) listing or the CRF Appendix. If the countermeasure is not in the CRF list then Consultant shall use the Crash Modification Factors (CMF) in the HSM Part D and/or FHWA CMF Clearinghouse to indicate the potential relative crash percentile reduction for each safety strategy. CMF studies' volume parameters must be within $10 \%$ of the roadway volume to which they will be applied.

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$ 。
VOLUME 2

Technical Memorandum \#6:
Current System Conditions

## TECHNICAL MEMORANDUM \#6

Current System Conditions (Task 5.5)
Date: January 14, 2019
To: City of Coos Bay
City of North Bend
Oregon Department of Transportation, Region 3
From: Angela Rogge, PE, Sepehr Dastgheibi, EIT, and Matt Hartnett, EIT, David Evans and Associates, Inc.
Brooke Jordan and Drew DeVitis, Jacobs
Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
This memorandum presents an evaluation of how the Cities of Coos Bay and North Bend's transportation systems operate under existing conditions. The most recent Transportation System Plans were developed for the Cities of Coos Bay and North Bend in 2004. Five years remain of the current TSP's 2023 planning horizon but recent developments and plans necessitate an update. The Cities must update their TSP to maintain a 20-year planning horizon and comply with the Transportation Planning Rule (TPR).

## Study Area

The Project includes two distinct areas, the City of North Bend and the City of Coos Bay. The cities are located in Coos County, Oregon on the Pacific Ocean. The City of North Bend is surrounded on three sides by Coos Bay, sharing its southern border with the City of Coos Bay, which is near where the Coos River enters Coos Bay. Together, they are referred to as one entity called either Coos Bay/North Bend, or the Bay Area. The study area is the boundary for the Project, which includes, at a minimum, City Limits, Urban Growth Boundary ("UGB") and urban reserves.

A TSP examines the City's multimodal transportation system as a whole, considers planning for street maintenance, connectivity, access, safety and the impact of future growth throughout the network. In order to review the system that is most likely to affect an average Bay Area citizen or visitor, and to efficiently use time and resources for analysis, TSPs generally focus on the higher-order, arterial and collector street system. Arterials and collectors, by definition, provide connections across a city and between neighborhoods and activity centers. As such, the arterial and collector street intersections and corridors are the focus of the TSP Update.

Figure 1 summarizes the study intersections for North Bend and Coos Bay, located and on the arterial and collector street network. There are 26 study intersections in North Bend, and 28 in Coos Bay, although residents and visitors often travel through both cities.


| --...) Urban Growth Boundary (UGB) | ODOT Functional Classification |
| :---: | :---: |
| Study Area Intersections Principal Arterial |  |
| O North Bend | - Minor Arterial |
| O Coos Bay | City Functional Classification |
|  | Arterial |
|  | - Collector |
|  | - Neighborhood |
|  | Local |



Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

Figure 1. Study Intersections

## Transportation in the Bay Area

The following sections will evaluate the current transportation system operations by mode. The evaluation relies on data collected in Technical Memorandum \#4: System Inventory and volume data collected at the study area intersections identified in Figure 1.

## Pedestrian Conditions

A robust pedestrian network provides a safe, convenient and accessible system of sidewalks, paths and crossings. The pedestrian experience is also linked to other modal systems. For example, crossing several lanes of traffic increases stress on the pedestrian, while the presence of bicycle lanes improves comfort by providing a buffer between the pedestrian and vehicles. This section reviews the Bay Area pedestrian network at a system-wide level.

## Pedestrian Volumes

This section summarizes the trends in pedestrian volumes at the study intersections during the weekday PM peak hour. The information is based on counts collected in the summer of 2017 and detailed summaries of the traffic counts are available in the appendix.

In North Bend, the area with the highest number of pedestrians was along Virginia Avenue between Broadway Avenue and US 101. This segment of Virginia Avenue provides access to the downtown and commercial businesses. All of the study area intersections saw at least one pedestrian during the evening peak hour ( $4: 30 \mathrm{pm}-5: 30 \mathrm{pm}$ ).

In Coos Bay, the area with the highest number of pedestrians was in downtown near US 101 at Johnson Avenue and near Commercial Avenue. In addition to these commercial areas, the intersection of $7^{\text {th }}$ Street at Anderson Avenue also had a significant portion of the study intersections' pedestrian volumes. This location connects a residential neighborhood with a grocery market.

## Pedestrian Level of Traffic Stress

Pedestrian facilities were evaluated for all arterials and collectors, as well as any roadways or pathways that provide critical routes or links within the study area. The assessment was done based on the Pedestrian Level of Traffic Stress (PLTS) as outlined in the ODOT Analysis Procedures Manual (APM).

When rating each pedestrian corridor, the following factors were considered:

- Sidewalk condition and width
- Buffer type and width
- Bike lane width
- Parking width
- Number of lanes and posted speed
- Illumination presence
- General land use

The presence of sidewalks alone does not necessarily equate to a comfortable experience for a pedestrian. Walking near busy streets or along narrow sidewalks can cause stress or discomfort. PLTS 2 is considered a reasonable minimum target for pedestrian routes, with areas near schools striving for a PLTS 1 to best serve the higher number of children at these locations.


As shown in Figure 2, in North Bend and Coos Bay, none of the evaluated facilities is PLTS 1. Many of the arterial and collector streets outside of the downtown area have speeds greater than 25 mph or limited to no buffer between the sidewalk and vehicular traffic, which heavily influence PLTS rating. Most links with PLTS 4 fall into one of two categories: (a) there is no sidewalk or (b) there is a sidewalk, but the sidewalk little or no buffer for a high-speed, high-capacity segment.

## Intersection Density

Intersection density is one measure of the connectivity of the roadway, and therefore most of the sidewalk and bike lane, system. An area with high intersection density usually requires less out of direction travel, so distances are shorter and more conducive to taking trips without a car. Figure 3 displays a heat map representing intersection density and highlights gaps in network connectivity.

In North Bend, Pony Creek and the existing terrain create natural barriers to connectivity between neighborhoods. Northwest North Bend has long residential blocks while the neighborhood directly east of Southwestern Oregon Community College has a tighter grid system, which is welcoming for pedestrian travel.

In Coos Bay, Pony Creek, the Empire Lakes and Isthmus Slough are the most prominent natural barriers to connectivity between neighborhoods. Southwest Coos Bay is zoned almost completely as a watershed, which creates a barrier between west and east Coos Bay. The downtown network is a connected grid system and the by far has the highest intersection density in the city.

When it is time to identify potential alternatives, new connections such as shared-use paths could improve route options for pedestrians in established neighborhoods with limited connectivity.

## Coos Bay/North Bend TSP


$\square$ Urban Growth Boundary (UGB)
Pedestrian Level of Traffic Stress (PLTS)



Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online



Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Bicycle Conditions

Bicycling can provide alternative travel choices to the automobile and supports a healthy lifestyle. Compared to pedestrian travel, bicycling is more suitable for longer trips. This section describes the existing bicycle conditions within the Bay Area. Bicycle facilities include shared streets, bike lanes, shoulders and the trail system.

## Bicycle Volumes

This section summarizes the trends in bicycle volumes at the study intersections during the weekday PM peak hour. The information is based on counts collected in the summer of 2017 and detailed summaries of the traffic counts are available in the appendix.

In North Bend, bicycle volumes range between zero and five at the study area intersections during the peak hour. Most of the volumes were recorded crossing Virginia Avenue between Broadway Street at US 101. This corridor was also the most heavily trafficked pedestrian corridor in North Bend.

In Coos Bay, bicycle volumes range between zero and five at the study area intersections during the peak hour. The intersections with the highest recorded bikes were Newmark Avenue at Ocean Boulevard, US 101 at Koosbay Boulevard and Elrod Avenue at $10^{\text {th }}$ Street.

## Bicycle Level of Traffic Stress

Chapter 14 of the ODOT Analysis and Procedures Manual provides a methodology for evaluating the bicycle level of traffic stress (BLTS) for roadways within both urban and rural environments. This methodology, adopted from a report by the Mineta Transportation Institute on "Low Stress Bicycling and Network Connectivity", provides a valuable metric to quantify the perceived safety issues bicyclists face from vehicle traffic on roadways with and without bicycle facilities. ${ }^{1}$ The BLTS methodology is based on the premise first articulated by the City of Portland that upwards of 60 percent the population is "interested, but concerned" in bicycling, as they have little stress tolerance and will only feel comfortable on routes that have the greatest perceived safety.


Bicycle Level of Traffic Stress ratings range from LTS 1 (little traffic stress, suitable for all cyclists) to LTS 4 (high stress and suitable for experienced and skilled cyclists). Three classes of criteria are used to determine BLTS based on existing conditions:

1) Facilities containing Bike Lane with Adjacent Parking Lane;
2) Facilities containing Bike Lane without Adjacent Parking Lane;
3) Urban/Suburban Facilities with Mixed Traffic.
[^34]As existing bike lanes within North Bend and Coos Bay are limited at present, the project team evaluated most of the roadway network in the Cities using the Urban/Suburban Mixed Traffic LTS Criteria as shown below in Table 1. Figure 4 shows the Bicycle Level of Traffic Stress for all arterials and collectors in North Bend and Coos Bay.

Table 1. Urban/Suburban Mixed Traffic BLTS Criteria

| Prevailing Speed or Speed Limit (mph) | Unmarked Centerline | 1 Lane per Direction | 2 lanes per direction | $3+$ lanes per direction |
| :---: | :---: | :---: | :---: | :---: |
| <25 | BLTS 1 | BLTS 2 | BLTS 3 | BLTS 4 |
| 30 | BLTS 2 | BLTS 3 | BLTS 4 | BLTS 4 |
| >35 | BLTS 3 | BLTS 4 | BLTS 4 | BLTS 4 |

The BLTS methodology does not include explicit consideration of traffic volumes, as the proximity stress is present regardless of how much traffic happens to be occurring at that time. Considerations that are not factored into BLTS analysis, but may influence traffic stress, include topography changes, pavement conditions, and width of vehicle lanes.

$\square$ Urban Growth Boundary (UGB)
Bicycle Level of Traffic Stress
——BLTS 1
——BLTS 2
——BLTS 3
——BLTS 4


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRIArcGIS Online

## Transit Conditions

This section reviews the existing transit system conditions and operations. A transit system assessment was completed based on the qualitative multimodal application that is outlined in the ODOT APM and uses available data from Technical Memorandum \#4 (Transportation System Inventory).

## Transit Qualitative Assessment

A Qualitative Multimodal Assessment (QMA) methodology uses the principles of the 2010 Highway Capacity Manual's Multimodal Level of Service through general roadway characteristics to apply a context-based subjective Excellent, Good, Fair, or Poor rating. A QMA provides a high-level screening tool for Transportation System Plans to assess existing conditions to highlight deficiencies and consider future improvements. Distinct transportation modes, including auto, transit, bicycle, and pedestrian movement, are analyzed through individual QMAs. For a Transit Qualitative Multimodal Assessment, the factors utilized according to ODOT's Analysis Procedure Manual include:

- Frequency and on-time reliability;
- Schedule speed/travel times;
- Transit stop amenities; and
- Connecting pedestrian/bike network.

For the purpose of this memorandum, the transit QMA is primarily focused on the CCAT Bay Area Loop, as it provides transit service between and within the Cities of North Bend and Coos Bay. Secondary consideration has been given to intercity transit service provided by Coos County Area Transit, Curry Public Transit, Pacific Crest, and others. Figure 5 shows the Transit QMA for both Cities, which rates as Fair for the Bay Area Loop service.

As of this writing, CCAT reports that 95 percent of CCAT Bay Area Loop service runs on time. While there is no-real time information about schedule speed and performance, on-time reliability indicates that transit vehicles are operating efficiently to meet the Loop schedule. Both the East and West Loop run daily Monday through Friday and have 1.5 -hour headways for a full run, which provides only a fair level of service for a community the size of the Coos Bay Area. Existing service is not offered on weekends or after $5: 30 \mathrm{pm}$ on weekdays, and there is no central transit hub for connections between intra- and intercity bus service. In addition, frequencies are limited for intercity service to communities in greater Coos County, as well as service south to Curry County, north to Douglas County, and east to Roseburg and Eugene.

Within North Bend and Coos Bay, CCAT has several transit stops with shelters and benches, serving higher ridership destinations. The connecting pedestrian and bicycle network to Bay Area Loop service, which is limited in several areas, has also been used as a criterion to yield a fair Transit QMA rating. Segments of the Bay Area Loop have limited or incomplete sidewalks on both sides of the street, are largely on arterials with limited crosswalks, and have limited bicycle facilities. In addition, these sections of the Bay Area Loop are on roadways that have not been upgraded to meet standards developed for the 2004 TSP updates.



Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Street and Highway System Conditions

The assessment of traffic conditions includes development of existing traffic volumes and assessment of traffic operations for the 54 study intersections within the North Bend and Coos Bay UGBs.

## Volume Development

ODOT generally requires that transportation facilities be analyzed under design hourly volumes (DHVs), known as 30th highest hour volumes. The 30th highest hour volumes are used in traffic operations analysis so that results are valid for all but a few hours of the year. ODOT's APM outlines the procedure for determining 30th highest hour volumes. Further details on the traffic analysis methodology is located in the appendix.

## Turn Movement Volumes

Motor vehicle volumes on the roadways in the study area peak during the evening between 4:30 p.m. and 5:30 p.m., but generally vary depending on the time of year. During the summer months, traffic volumes increase due to an influx of vacationers and visitors to the Bay Area.

Figure 6 and Figure 7 show the existing balanced $30^{\text {th }}$ highest hour PM peak volumes developed for this project. The intersections that see the highest vehicular volumes during the peak hour in North Bend are Broadway St at Newmark Ave and US 101 at Newmark Avenue. In Coos Bay, the highest volume intersections are US 101 at Koos Bay Boulevard and US 101 South at Johnson Avenue.

## Average Daily Traffic Volumes

The average annual daily traffic (AADT) volumes for state facilities in the study area are currently available for the year 2016. The volumes are summarized in Table 2.

Table 2. Average Annual Daily Traffic Volumes

| Location Description | Volume | City |
| :--- | :--- | :--- |
| US 101 |  |  |
| North of Florida Ave | $14,800 \mathrm{vpd}$ | North Bend |
| North of Cape Arago Hwy (Virginia Ave) - southbound one-way | $9,900 \mathrm{vpd}$ | North Bend |
| North of Cape Arago Hwy (Virginia Ave) - northbound one-way | $6,600 \mathrm{vpd}$ | North Bend |
| South of Sheridan Ave | $13,900 \mathrm{vpd}$ | North Bend |
| South city limits of North Bend, north city limits of Coos Bay | $20,400 \mathrm{vpd}$ | NB/CB |
| North of Hemlock Ave | $20,800 \mathrm{vpd}$ | Coos Bay |
| South of Anderson Ave - southbound one-way | $13,300 \mathrm{vpd}$ | Coos Bay |
| South of Anderson Ave - northbound one-way | $12,100 \mathrm{vpd}$ | Coos Bay |
| South city limits of Coos Bay | $23,600 \mathrm{vpd}$ | Coos Bay |
| Cape Arago Hwy |  |  |
| Between US 101 northbound and southbound | $5,500 \mathrm{vpd}$ | Coos Bay |
| West of Meade Ave (on Virginia Ave) | $14,500 \mathrm{vpd}$ | Coos Bay |
| North of 16th St (on Broadway St) | $11,300 \mathrm{vpd}$ | Coos Bay |
| East of Oak St (on Newmark Ave) | $16,300 \mathrm{vpd}$ | Coos Bay |
| South city limits of Coos Bay | $8,100 \mathrm{vpd}$ | Coos Bay |

Source: 2016 Transportation Volume Tables, ODOT Transportation Development Division.




## Legend

$\vec{\imath}$ Allowable Movement
ver Signalized Intersection

TEV Total Entering Volume

Figure 6
Existing (2017)
PM Peak Hour (4:30-5:30 PM)
Turn Movement Volumes
North Bend




## Legend

$\vec{\imath}$ Allowable Movement

## , if: Signalized Intersection

TEV Total Entering Volume

STOP Controlled Approach

Figure 7
Existing (2017)
PM Peak Hour (4:30-5:30 PM)
Turn Movement Volumes
Coos Bay

## Truck Traffic (Freight)

The percentage of truck traffic at the study intersections (measured against total entering volume) ranges from 0-13\% during the peak hour. Truck traffic volumes are highest along US 101 and at the intersections that access commercial centers, which is consistent with land uses along these corridors.

In North Bend, the intersection of US 101 at Florida Avenue has the highest volume of trucks of all the study area intersections during the peak hour.

In Coos Bay, the intersections experiencing the highest volume of trucks are US 101 at Koosbay Boulevard, US 101 South at Commercial Avenue and US 101 North at Johnson Avenue.

Within both cities, US 101 is classified as a Reduction Review Route (RRR). An RRR is a facility that is required by ORS 366.215 to be reviewed during all planning, project development, development review, and maintenance projects for "hole in the air" capacity. No changes can be made to the US101 corridor that will permanently reduce capacity in any way unless it is required for safety reasons or an exception is made by the Oregon Transportation Commission.

## Operational Criteria

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and $\mathrm{v} / \mathrm{c}$ ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Volume-to-Capacity (V/C) Ratio: A comparison of traffic volume to intersection capacity. As the $\mathrm{v} / \mathrm{c}$ ratio approaches 1.00 , traffic becomes more congested and unstable, with longer delays.

Level of Service (LOS): Level of service is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a STOPcontrolled intersection, the $\mathrm{v} / \mathrm{c}$ ratio might indicate that there is adequate capacity to process the demand for that movement. Similarly, at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both $v / c$ ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

## Traffic Mobility Targets <br> Cities of North Bend and Coos Bay

The North Bend Municipal Code states "City streets shall maintain a LOS of "D," as defined by the Highway Capacity Manual (2000 Edition), during the p.m. peak hour of the day. A lesser standard may be
accepted for local street intersections or driveway access points that intersect with collector or arterial streets, if alternative signalized access is available and these intersections are found to operate safely.

Coos Bay Municipal Code states "City streets shall maintain a LOS of "D" during the p.m. peak hour of the day."

## Coos County

None of the TSP study area intersections are under Coos County jurisdiction; all of the study area intersections are within the North Bend and Coos Bay city limits.

## State of Oregon

For State facilities, the Oregon Highway Plan (OHP) will be used in the assessment of intersection operations. Table 3 summarizes the applicable mobility targets for ODOT facilities, which are based on the $\mathrm{v} / \mathrm{c}$.

Table 3. Applicable Mobility Targets for State Highways

| State Highways |  | ${\text { Mobility } \text { Target }^{1}}^{2}$ |
| :--- | :--- | :---: |
| US 101 <br> (Freight Route on a Statewide Highway) | Non-MPO, Outside STAs, $\leq 45 \mathrm{mph}$ | 0.85 |
| Cape Arago Highway <br> (District Highway) | Non-MPO, Outside STAs, $\leq 35 \mathrm{mph}$ | 0.80 |
| Local Interest Roads <br> (Unsignalized, intersects State facility) | Non-MPO, Outside STAs, $\leq 35 \mathrm{mph}$ | 0.95 |
|  | Non-MPO, Outside STAs, $\geq 45 \mathrm{mph}$ | 0.95 |

Source: Table 6: Volume to Capacity Ratio Targets Outside Metro, Oregon Highway Plan, 1999.

## Traffic Operations Analysis Procedures

All operations for unsignalized intersections were evaluated using the methodology outlined in the Highway Capacity Manual, $6^{\text {th }}$ Edition (HCM) and all operations for signalized intersections were evaluated using methodology outlined in the HCM 2000, along with the procedures outlined in ODOT's APM. The Synchro analysis software was selected to perform the intersection analysis since it can provide the $\mathrm{v} / \mathrm{c}$ ratio and LOS output of an HCM analysis.

The signal timing for the existing conditions analysis was collected from the most recent signal timing worksheets provided by ODOT; in order to most accurately reflect current conditions, timing was not optimized for analysis.

The appendix provides detailed descriptions of our analysis methodology.

## Driving Conditions

Table 4 and Table 5 report the operational results for the critical movement (worst movement that must stop or yield the right of travel to other traffic flows). Critical movements at unsignalized intersections are typically the minor-street left turns or, in the case of single-lane approaches, the minor street approaches. These movements are required to yield to all other movements at the intersection, thus are
subject to the longest delays, and have the least capacity. Left turns from the major street are also subject to delays, since motorists making these maneuvers must also yield to oncoming major-street traffic.

Analysis for the PM peak period shows that all of the study area intersections currently meet applicable mobility thresholds.

Table 4 summarizes the traffic operations for North Bend. Although none of the intersections exceeds the mobility targets, there are a couple locations nearing them: Broadway Street at Newmark Avenue and US 101 at Newmark Avenue. Coincidentally, these intersections are the highest volume intersections in the city. Both of these intersections are signalized. The operations indicate that certain movements may experiences longer delays but overall, the intersection is able to serve the traffic passing through during one cycle length.

Table 4. Existing PM Peak Hour Traffic Operations - North Bend

| ID | Intersection Name | Critical Movement ${ }^{1}$ | V/C ${ }^{2}$ | LOS ${ }^{2}$ | Mobility Target ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Arthur St at Colorado Lp | NBLR | 0.01 | A | LOS D |
| 2 | Oak St/W Airport Way at Colorado Ave/Maple Leaf | NBLTR | 0.01 | B | LOS D |
| 3 | Maple Leaf at E Airport Way | SBLR | 0.02 | B | LOS D |
| 4 | US 101 at Florida Ave | Overall | 0.61 | B | 0.85 |
|  | Virginia Ave at Arthur St | SBLR | 0.01 | B | LOS D |
| 6 | Virginia Ave at Oak St | NBLTR | 0.17 | B | LOS D |
| 7 | Virginia Ave at Maple St | SBLR | 0.30 | B | LOS D |
| 8 | Virginia Ave at Broadway St | Overall | 0.70 | B | 0.95 |
| 9 | Virginia Ave at Pony Village Main Driveway | Overall | 0.49 | A | 0.95 |
| 10 | Virginia Ave at Harrison Ave | Overall | 0.45 | B | 0.95 |
| 11 | Virginia Ave at Meade Ave | EBTL | 0.35 | B | 0.95 |
|  |  | SBLTR | 0.36 | C | 0.95 |
| 12 | Virginia Ave at US 101 South | Overall | 0.40 | B | 0.85 |
| 13 | Virginia Ave at US 101 North | Overall | 0.43 | A | 0.85 |
| 14 | Marion Ave at Safeway Driveway | WBLR | 0.20 | B | LOS D |
| 15 | Washington Ave at US 101 South/Sherman Ave | SBL | 0.02 | A | 0.85 |
|  |  | EBTR | 0.03 | B | 0.95 |
| 16 | Pony Creek Rd at Crowell Ln | EBLR | 0.11 | B | LOS D |
| 17 | Oak St at 16th/17th St | NBLTR | 0.13 | A | LOS D |
| 18 | Broadway St at 16th St | Overall | 0.46 | A | 0.95 |
| 19 | Broadway Ave at 17th St | NBL | 0.06 | A | 0.95 |
|  |  | EBLTR | 0.11 | C | 0.95 |


| ID | Intersection Name | Critical Movement ${ }^{1}$ | V/C² | $L^{\text {OS }}$ | Mobility Target ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 20 | US 101 at Mill Casino Entrance | Overall | 0.49 | A | 0.80 |
| 21 | Newmark Ave at Oak St | Overall | 0.56 | A | LOS D |
| 22 | Broadway St at Newmark Ave | Overall | 0.83 | D | 0.95 |
| 23 | Newmark St at Edgewood Dr | NBLR | 0.17 | C | LOS D |
| 24 | Newmark Ave at Brusells St | Overall | 0.40 | A | LOS D |
| 25 | Newmark St at Sherman Ave | Overall | 0.59 | C | LOS D |
| 26 | US 101 at Newmark St | Overall | 0.70 | C | 0.80 |

Acronyms: $\mathrm{EB}=$ eastbound; $\mathrm{WB}=$ westbound; $\mathrm{NB}=$ northbound; and $\mathrm{SB}=$ southbound. $\mathrm{L}=$ left; $\mathrm{T}=$ through; and $\mathrm{R}=$ right. Notes:

1. At intersections, the results are reported for the worst operating movements on major and minor approaches that must stop or yield the right of travel to other traffic flows. For signalized intersections, the overall operations are reported.
2. The $\mathrm{v} / \mathrm{c}$ ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which does not account for the influence of adjacent intersection operations.
3. Mobility target is reported for the critical movement; Unsignalized intersections may have two different mobility targets for the major and minor approaches (Action 1F.1, Oregon Highway Plan, 1999)

Table 5 summarizes the traffic operations for Coos Bay. Although none of the intersections exceeds the mobility targets, there are a couple locations nearing them: $7^{\text {th }}$ Street at Anderson Avenue and Johnson Avenue at US 101 South. The intersection of $7^{\text {th }}$ Street at Anderson Avenue is stop-controlled intersection with free flowing traffic on Anderson Avenue that side street traffic must wait for. Johnson Avenue at US 101 South is a five-legged intersection and one of the busiest intersections in Coos Bay.

Table 5. Existing PM Peak Hour Traffic Operations - Coos Bay

| ID | Intersection Name | Critical <br> Movement ${ }^{1}$ | V/C $^{2}$ | LOS $^{2}$ | Mobility <br> Target $^{3}$ |
| :--- | :--- | :---: | :---: | :---: | :---: |
| 27 | Morrison St at Lakeshore Dr | EBLR | 0.11 | A | LOS D |
| 28 | Newmark Ave at Cape Arago Hwy/Empire Blvd | NBLTR | 0.04 | C | LOS D |
| 29 | Newmark Ave at Morrison St | Overall | 0.54 | C | LOS D |
| 30 | Newmark Ave at Ocean Blvd | Overall | 0.30 | A | LOS D |
| 31 | Newmark Ave at Laclair St | WBLR | 0.12 | C | LOS D |
| 32 | Empire Blvd at Pacific Ave | WBR | 0.28 | B | LOS D |
| 33 | Thompson Rd at Woodland Dr | EBLR | 0.49 | C | LOS D |
| 34 | Koosbay Blvd at Thompson Rd | Overall | 0.57 | B | LOS D |
| 35 | Ocean Blvd at Woodland Dr | Overall | 0.54 | A | LOS D |
| 36 | Ocean Blvd at Butler Rd | WBLR | 0.36 | C | LOS D |
| 37 | Koosbay Blvd at 10th St | Overall | 0.60 | A | 0.80 |
| 38 | Us 101 at Koosbay Blvd | EBR | 0.06 | A | LOS D |
| 39 | 7th St at Commercial Ave |  |  |  |  |


| ID | Intersection Name | Critical Movement ${ }^{1}$ | V/C ${ }^{2}$ | LOS $^{2}$ | Mobility Target ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 40 | Commercial Ave at US 101 South | Overall | 0.55 | B | 0.85 |
| 41 | Commercial Ave at US 101 North | -- | -- | A | 0.85 |
| 42 | 10th St at Central Ave | Overall | 0.62 | B | LOS D |
| 43 | Central Ave at 7th St | WBL | 0.01 | A | LOS D |
| 44 | 7th St at Anderson Ave | NBLTR | 0.40 | D | LOS D |
| 45 | Elrod Ave at 10th St | SBLR | 0.21 | A | LOS D |
| 46 | 11th St at Ingersoll Ave | SBLTR | 0.13 | A | LOS D |
| 47 | 7th St at Ingersoll Ave | SBLTR | 0.13 | A | LOS D |
| 48 | Hall Ave at US 101 South | Overall | 0.52 | A | 0.85 |
| 49 | Hall Ave at US 101 North | NBL | 0.05 | A | 0.85 |
|  |  | EBLT | 0.28 | D | 0.95 |
| 50 | Johnson Ave at US 101 South | Overall | 0.54 | F | 0.85 |
| 51 | Johnson Ave at US 101 North | Overall | 0.61 | B | 0.85 |
| 52 | 7th St at Lockhart Ave/Southwest Blvd | SBLR | 0.10 | B | LOS D |
| 53 | 6th Ave at D St / Coos River Hwy | WBLTR | 0.24 | B | LOS D |
| 54 | Coos River Rd at Ross Inlet Rd | SBLR | 0.10 | A | LOS D |

Acronyms: $\mathrm{EB}=$ eastbound; $\mathrm{WB}=$ westbound; $\mathrm{NB}=$ northbound; and $\mathrm{SB}=$ southbound. $\mathrm{L}=$ left; $\mathrm{T}=$ through; and $\mathrm{R}=$ right. Notes:

1. At intersections, the results are reported for the worst operating movements on major and minor approaches that must stop or yield the right of travel to other traffic flows. For signalized intersections, the overall operations are reported.
2. The $\mathrm{v} / \mathrm{c}$ ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which does not account for the influence of adjacent intersection operations.
3. Mobility target is reported for the critical movement; Unsignalized intersections may have two different mobility targets for the major and minor approaches (Action 1F.1, Oregon Highway Plan, 1999)

## Air Conditions

Southwest Oregon Regional Airport (OTH) is located on approximately 620 acres of land extending out into Coos Bay, in the northern sections of North Bend and Coos Bay, roughly one mile west of US 101. Owned and operated by the Coos County Airport District (CCAD), OTH is the only commercial service airport on the Oregon Coast. ${ }^{2}$ Currently, there is no direct commercial passenger service between OTH and Portland. The airport also accommodates private aircraft arrivals and departures and serves as a base for US Coast Guard operations.

The Southwest Oregon Regional Airport (OTH) Master Plan, completed in 2013, determined the capacity of roads accessing the airport to be adequate throughout the 20-year planning horizon identified in the document. Parking and rental vehicles are available on airport property. Sidewalks connect the airport's

[^35]passenger terminal with sidewalk facilities off airport property. OTH is not served by any local public transportation service.

OTH uses two runways to serve arriving and departing fixed wing aircraft, both of which are designed to accommodate Airport Reference Code B-III aircraft. The airport's 2013 documents a number of airport facility needs, which include runway improvements to meet design standards for C-III aircraft, taxiway improvements, and upgrades to runway lighting systems. In 2018, OTH received two Federal grant awards to improve airfield lighting and signage and complete an environmental assessment for primary runway safety area improvements. ${ }^{3}$

Improvement and expansion of the airport are identified objectives in the Comprehensive Plans and TSPs for both the Cities of Coos Bay and North Bend. Additionally, the OTH Master Plan's goal is to evaluate improvements necessary to respond to changes in the aircraft and airline industries.

## Rail Conditions

One railroad line, the Coos Bay Rail Line, passes through the Bay Area. The line runs parallel to US 101 and has 15 at-grade crossings where rail line intersects a number of local roads in North Bend (6) and Coos Bay (9). This spring/summer (2018) the rail line has been shut down due to a failure of the swing span bridge crossing Coos Bay (the bridge has been stuck). Repairs are expected to be complete by the time the TSPs are finalized.

Detailed information on frequency of service was not available. No passenger rail service is available in the study area; the closest available is AMTRAK located in Eugene, Oregon.

## At-Grade Crossings

Table 6 summarizes the characteristics of the 15 at-grade rail crossings of public streets. Only one of the at-grade crossings has active traffic control devices, meaning warning devices such as flashing lights or gates activate when a train is arriving.

Passive and active signs and devices are installed based on the type of environment. For some locations, passive signs are enough. Crossings with a lot of traffic or a history of crashes/incidents may necessitate an active warning system. The Federal Railroad Administration (FRA) maintains records of crashes or other incidents involving trains. No incidents have been reported in North Bend or Coos Bay in the past ten years. ${ }^{4}$

## Table 6. At-Grade Rail Crossings in North Bend and Coos Bay

| Crossing <br> Number | Street | Warning Device(s) | Multimodal Conditions ${ }^{1}$ | City |
| :--- | :--- | :--- | :--- | :--- |
| 756117X | Sheridan Ave | Cross bucks; stop <br> signs | Shared roadway (narrow) | North Bend |
| 756155G | California St | Cross bucks; stop <br> signs | Passive sidewalk crossing <br> both sides | North Bend |
| 756156 N | Virginia Ave | Cross bucks; stop <br> signs | Passive sidewalk crossing <br> both sides | North Bend |

[^36]| Crossing Number | Street | Warning Device(s) | Multimodal Conditions ${ }^{1}$ | City |
| :---: | :---: | :---: | :---: | :---: |
| 756157V | Washington Ave | Cross bucks; stop signs | Passive sidewalk crossing both sides | North Bend |
| 756161K | Lewis St | Gates; Flashing <br> Lights; Cross bucks | Passive sidewalk crossing on south side | North Bend |
| 756163Y | Newmark St | Flashing Lights; Cross bucks; traffic signal | Passive sidewalk crossing on north side | North Bend |
| 756128K | Market Ave at Front St | None | Shared roadway; no pavement markings; sidewalks on Front St | Coos Bay |
| 756129S | Alder Ave at Front St | Cross buck; stop sign | Shared roadway; sidewalks | Coos Bay |
| 756130L | Birch Ave at Front St | Cross buck; stop sign | Shared roadway; sidewalks on Front St (south leg) | Coos Bay |
| $756131 T$ | Cedar Ave at Front St | Cross buck; stop sign | Shared roadway; sidewalk on southwest corner | Coos Bay |
| 756135V | Date Ave at Front St | Cross buck; stop sign | Shared roadway; no pavement markings | Coos Bay |
| 756136C | Fir St at Front St | Cross buck; yield sign | Shared roadway; no pavement markings | Coos Bay |
| 756140S | US 101 at Hemlock Ave | Cross bucks | Shared roadway | Coos Bay |
| 756141Y | US 101 at Us PlywoodCentral Dock Rd | None | Shared roadway; no pavement markings | Coos Bay |
| 927324R | Anderson Avenue | Cross bucks; yield Signs | Passive pedestrian crossing; no motor vehicle access | Coos Bay |

Sources: Bing Maps, ODOT TransGis and FRA Public Grade Crossing Inventory By State and County (2018)

1. Shared roadway signifies right-of-way is shared by a variety of modes (motor vehicles, bicycles and/or pedestrians)

## Marine Conditions

Coos Bay and North Bend are set on Coos Bay, a major inlet draining into the Pacific Ocean. The Bay's navigation channel is designed and maintained by the US Army Corps of Engineers and facilitates significant maritime trade activity at six marine terminals, seven deep-draft berths, and a number of barge facilities. ${ }^{5}$ The Port of Coos Bay moves more than 1.5 million tons of cargo annually - more than any other seaport in Oregon.

The Cities' Comprehensive Plans identify need for additional port facilities, given current levels of activity and its importance to the region. They also identify need for additional capacity for commercial fishing and recreational boats in the Bay Area.

[^37]
## Pipeline

There is one major natural gas pipeline that serves North Bend and Coos Bay and numerous secondary natural gas distribution lines that spur off the mainline to provide gas to residences and businesses. The major pipeline is part of a system operated by Northwest Natural Gas Company and travels north-south from south Coos Bay to Newmark Avenue, where it then extends west. ${ }^{6}$

No changes to the pipeline system are planned within North Bend or Coos Bay at this time, however a liquefied natural gas (LNG) terminal is proposed on the North Spit, which is north of the study area, across the bay from OTH. The proposed pipeline is a 36 -inch diameter pipeline that would extend from the LNG terminal to the Ruby Pipeline and the Gas Transmission Northwest (GTN) Pipeline near Malin, Oregon.

## Safety Evaluation

A safety analysis was conducted to determine whether any significant, documented safety issues exist within the study area and to inform future measures or general strategies for improving overall safety. This analysis includes a review of crash records, critical crash rates, and ODOT Safety Priority Index System (SPIS) data.

## Crash History

The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2012, and December 31, 2016, which were the five most recent full years for which crash data were available at the time of the analysis. Detailed reports are contained in the appendix.

There were 1,744 documented crashes with the North Bend and Coos Bay UGBs between 2012 and 2016, which are shown in Figure 8. Approximately 49 percent of the crashes occurred in North Bend, and the other 51 percent in Coos Bay. In total, there were five crashes resulting in fatalities. The fatalities occurred at the following locations:

- US 101 South, south of Johnson Avenue
- Virginia Avenue (Cape Arago Highway) at Meade Avenue
- Newmark Avenue (Cape Arago Highway) at Oak Street
- US 101 at Florida Avenue
- Ocean Boulevard at $19^{\text {th }}$ Street

The crash data for the sections of US 101 and Newport Lane/Coos River Highway (OR 241) is also included because the roads connect the Coos Bay UGB. There are an additional 78 crashes for this segment and they are documented in Figure 8.

[^38]Exhibit 1 summarizes collision types in the UGBs. The majority of the crashes were rear end or turning related collisions.

Reviewing the data from study area intersections, there were 609 crashes. Of those, approximately 63 percent occurred in North Bend, and the remaining 37 percent in Coos Bay.


Exhibit 1. Summary of North Bend and Coos Bay Collision Types

## Coos Bay/North Bend TSP



Urban Growth Boundary (UGB)

## Crash Severity

- Fatal
- Non-Fatal Injury
- Property Damage Only


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Network Screening

Crash rates are a measure of the number of crashes in relation to amount of traffic volume served. Table 7 summarizes important crash information and notes whether the measured crash rate exceeds the critical crash rate and/or the ODOT 90th percentile crash rate. If it exceeds one of these thresholds, it is an indication that a problem might exist and that further study is warranted.

The Highway Safety Manual (HSM) Part B describes the critical crash rate method as a means of identifying locations that warrant further investigation. The critical crash rate is specific to the combined study areas (North Bend and Coos Bay UGBs) and considers average crash rates at comparable sites, traffic volume, and a confidence interval. The statewide 90th percentile crash rate represents similar intersections across Oregon. Calculations and detailed collision reports are available in the appendix.

Table 7. Crash History at Study Area Intersections (2012-2016)

| ID | Intersection | Crashes | Fatal | Serious Injury | Crash <br> Rate ${ }^{1,2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Arthur St at Colorado Lp | 0 | 0 | 0 | 0.00 |
| 2 | Oak St/W Airport Way at Colorado Ave/Maple Leaf | 0 | 0 | 0 | 0.00 |
| 3 | Maple Leaf at E Airport Way | 0 | 0 | 0 | 0.00 |
| 4 | US 101 at Florida Ave | 15 | 0 | 0 | 0.39 |
| 5 | Virginia Ave at Arthur St | 1 | 0 | 0 | 0.15 |
| 6 | Virginia Ave at Oak St | 5 | 0 | 0 | 0.35 |
| 7 | Virginia Ave at Maple St | 3 | 0 | 0 | 0.15 |
| 8 | Virginia Ave at Broadway St | 24 | 0 | 0 | 0.60 |
| 9 | Virginia Ave at Pony Village Main Driveway | 10 | 0 | 0 | 0.25 |
| 10 | Virginia Ave at Harrison Ave | 15 | 0 | 0 | 0.38 |
| 11 | Virginia Ave at Meade Ave | 16 | 1 | 1 | 0.36 |
| 12 | Virginia Ave at US 101 South | 60 | 0 | 0 | 1.51 |
| 13 | Virginia Ave at US 101 North | 8 | 0 | 1 | 0.32 |
| 14 | Marion Ave at Safeway Driveway | 0 | 0 | 0 | 0.00 |
| 15 | Washington Ave at US 101 South/Sherman Ave | 16 | 0 | 0 | 0.69 |
| 16 | Pony Creek Rd at Crowell Ln | 3 | 0 | 0 | $\underline{0.33}$ |
| 17 | Oak St at 16th/17th St | 1 | 0 | 0 | 0.16 |
| 18 | Broadway St at 16th St | 13 | 0 | 0 | 0.38 |
| 19 | Broadway Ave at 17th St | 9 | 0 | 0 | 0.27 |
| 20 | US 101 at Mill Casino Entrance | 6 | 0 | 0 | 0.15 |
| 21 | Newmark Ave at Oak St | 11 | 1 | 0 | 0.23 |
| 22 | Broadway St at Newmark Ave | 64 | 0 | 4 | 1.12 |
| 23 | Newmark St at Edgewood Dr | 6 | 0 | 0 | 0.20 |
| 24 | Newmark Ave at Brusells St | 20 | 0 | 1 | 0.62 |
| 25 | Newmark St at Sherman Ave | 22 | 0 | 1 | 0.65 |
| 26 | US 101 at Newmark St | 57 | 0 | 1 | 1.11 |
| 27 | Morrison St at Lakeshore Dr | 1 | 0 | 0 | 0.18 |
| 28 | Newmark Ave at Cape Arago Hwy/Empire Blvd | 4 | 0 | 1 | 0.21 |
| 29 | Newmark Ave at Morrison St | 9 | 0 | 0 | 0.26 |
| 30 | Newmark Ave at Ocean Blvd | 17 | 0 | 0 | 0.44 |
| 31 | Newmark Ave at Laclair St | 17 | 0 | 0 | 0.50 |
| 32 | Empire Blvd at Pacific Ave | 3 | 0 | 0 | 0.15 |
| 33 | Thompson Rd at Woodland Dr | 11 | 0 | 0 | 0.49 |
| 34 | Koosbay Blvd at Thompson Rd | 3 | 0 | 0 | 0.16 |


| ID | Intersection | Crashes | Fatal | Serious Injury | Crash <br> Rate ${ }^{1,2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 35 | Ocean Blvd at Woodland Dr | 17 | 0 | 0 | 0.51 |
| 36 | Ocean Blvd at Butler Rd | 6 | 0 | 0 | 0.21 |
| 37 | Koosbay Blvd at 10th St | 8 | 0 | 0 | 0.48 |
| 38 | Us 101 at Koosbay Blvd | 6 | 0 | 0 | 0.11 |
| 39 | 7th St at Commercial Ave | 1 | 0 | 0 | 0.07 |
| 40 | Commercial Ave at US 101 South | 11 | 0 | 0 | 0.31 |
| 41 | Commercial Ave at US 101 North | 4 | 0 | 0 | 0.00 |
| 42 | 10th St at Central Ave | 17 | 0 | 0 | 0.49 |
| 43 | Central Ave at 7th St | 7 | 0 | 0 | 0.28 |
| 44 | 7th St at Anderson Ave | 5 | 0 | 0 | 0.25 |
| 45 | Elrod Ave at 10th St | 1 | 0 | 0 | 0.12 |
| 46 | 11th St at Ingersoll Ave | 1 | 0 | 0 | 0.27 |
| 47 | 7th St at Ingersoll Ave | 2 | 0 | 0 | 0.47 |
| 48 | Hall Ave at US 101 South | 13 | 0 | 0 | 0.34 |
| 49 | Hall Ave at US 101 North | 8 | 0 | 0 | 0.25 |
| 50 | Johnson Ave at US 101 South | 17 | 0 | 0 | 0.38 |
| 51 | Johnson Ave at US 101 North | 32 | 0 | 0 | 0.67 |
| 52 | 7th St at Lockhart Ave/Southwest Blvd | 0 | 0 | 0 | 0.00 |
| 53 | 6th Ave at D St / Coos River Hwy | 6 | 0 | 0 | 0.45 |
| 54 | Coos River Rd at Ross Inlet Rd | 0 | 0 | 0 | 0.00 |
|  |  | 609 | 2 | 10 | -- |

Bold/Italic/Underlined = Exceeds Statewide 90 ${ }^{\text {th }}$ Percentile Crash Rate; BLACK SHADED $=$ Exceeds Critical Crash Rate Source: ODOT Transportation Development Division, Crash Analysis and Reporting Unit 2012-2016

In North Bend, there are five intersections that exceed the statewide $90^{\text {th }}$ percentile crash rate, three of which also exceed the critical crash rate. These intersections and further details of their crash history are summarized below.

Virginia Avenue at US 101 South: Exceeds statewide $90^{\text {th }}$ percentile crash rate and critical crash rate. Of the 60 crashes at this intersection, the majority were angle (22) and sideswipe-overtaking (13) collisions. These collision types were mostly due to drivers disregarding the signal or improper lane changes.

Washington Avenue at US 101 South/Sherman Avenue: Exceeds statewide $90^{\text {th }}$ percentile crash rate. There is no distinct pattern in collision type; however, most were due to not yielding the right-of-way or disregarding a stop sign.

Pony Creek Road at Crowell Lane: Just exceeds statewide $90^{\text {th }}$ percentile crash rate. There were three crashes reported in the five-year analysis period at this residential location. All three crashes occurred during low light/dark conditions and were due to improper driving (speeding or failing to yield right-of-way).

Broadway Street at Newmark Avenue: Exceeds statewide $90^{\text {th }}$ percentile crash rate and critical crash rate. Of the 64 crashes at this intersection, the majority were rear end (37) and turning (15) collisions. The rear end collision types were mostly due to drivers following too closely or inattention. The turning collisions are mostly attributed to failing to yield the right-of-way. This
intersection recorded the highest number of crashes in both North Bend and Coos Bay and resulted in four serious injuries.

US 101 at Newmark Street: Exceeds statewide $90^{\text {th }}$ percentile crash rate and critical crash rate. Of the 57 crashes at this intersection, the majority were turning (31) and rear end (18) collisions. The rear end collision types were mostly due to drivers following too closely or inattention. The turning collisions are mostly attributed to failing to yield the right-of-way. This intersection recorded one serious injury.

In Coos Bay, there are five intersections that exceed the statewide $90^{\text {th }}$ percentile crash rate, three of which also exceed the critical crash rate. These intersections and further details of their crash history are summarized below.

Thompson Avenue at Woodland Drive: Exceeds statewide $90^{\text {th }}$ percentile crash rate and critical crash rate. All eleven of the crashes recorded at this intersection were turning collisions caused by drivers failing to yield the right-of-way.

Koosbay Boulevard at 10th Street: Exceeds statewide $90^{\text {th }}$ percentile crash rate and critical crash rate. Six of the eight crashes were rear end collisions, and the remaining two were turning collisions. A range of improper driver behavior was the cause (following too closely, failing to yield right-ofway, inattention and speeding).

7th Street at Ingersoll Avenue: Exceeds statewide 90 ${ }^{\text {th }}$ percentile crash rate. There were two crashes recorded that were the result of drivers failing to yield the right-of-way. This intersection was flagged because it is a low volume intersection.

Johnson Avenue at US $\mathbf{1 0 1}$ North: Exceeds statewide $90^{\text {th }}$ percentile crash rate and critical crash rate. Of the 32 crashes at this intersection, the majority were rear end (12) and angle (11) collisions. These collision types were mostly due to drivers following too closely (rear end) or disregarding the signal (angle). This intersection had the highest recorded number of crashes in Coos Bay.

6th Avenue at D Street / Coos River Highway: Exceeds statewide $90^{\text {th }}$ percentile crash rate. Of the six crashes at this intersection, three were turning and three were rear end collisions. There was not a clear pattern for the cause of these crashes.

These intersections account for 259 of the 609 crashes recorded at study area intersections (43 percent). Countermeasures for the intersections that exceed crash rate thresholds will be developed during the development of transportation alternatives.

## Segment Analysis

Crash rates can be calculated for both intersections and segments. The ODOT APM clarifies that segments should ideally be close to one mile in length. In the North Bend and Coos Bay urban areas, obtaining one-mile segments of roadway without intersections is not possible and short sections typically skew the crash rates. That said, the majority of urban crashes are intersection related and captured in Table 7 for the study intersections.

## Crash Trends

## Excess Proportion of Specific Crash Types

The Excess Proportion of Specific Crash Types method quantifies the extent to which a specific crash type (the target crash type) is overrepresented at an analysis site, compared to the average representation within a reference population. ${ }^{[1]}$ Excess proportion of specific crash type analysis does not consider the overall frequency or rate of crashes; instead, it considers only the type of crashes observed. ODOT provides a limited spreadsheet tool that implements excess proportion of specific crash types; the outputs from this spreadsheet are available the appendix.

For the study area, 24 intersections have greater than a 90-percent probability of a greater than expected proportion of specific crash types. The results are summarized below:

Table 8. Excess Proportion Crash Locations

| ID | Intersection | Angle | COLLISION TYPE <br> Probability ${ }^{1}$; Excess Proportion ${ }^{2}$ |  |  | Turning |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Fixed Object | Rear End | Sideswipe Overtaking |  |
| 4 | US 101 at Florida Ave |  |  |  | 1.00; 0.19 |  |
| 6 | Virginia Ave at Oak St | 0.98; 0.33 |  |  |  |  |
| 8 | Virginia Ave at Broadway St |  | 0.94; 0.05 |  |  |  |
| 11 | Virginia Ave at Meade Ave |  |  | 1.00; 0.18 |  |  |
| 12 | Virginia Ave at US 101 South | 1.00; 0.15 | 0.96; 0.02 |  |  |  |
| 15 | Washington Ave at US 101 South/Sherman Ave |  |  |  | 1.00; 0.24 |  |
| 19 | Broadway Ave at 17th St |  |  | 1.00; 0.17 |  |  |
| 22 | Broadway St at Newmark Ave |  |  | 1.00; 0.32 | 0.96; 0.02 |  |
| 23 | Newmark St at Edgewood Dr |  |  | 0.96; 0.31 |  |  |
| 24 | Newmark Ave at Brusells St | 0.95; 0.11 |  |  |  | 0.97; 0.22 |
| 25 | Newmark St at Sherman Ave | 0.99; 0.19 | 0.95; 0.07 |  |  |  |
| 26 | US 101 at Newmark St |  |  |  |  | 1.00; 0.25 |
| 28 | Newmark Ave at Cape Arago Hwy/Empire Blvd |  |  |  |  | 0.95; 0.55 |
| 30 | Newmark Ave at Ocean Blvd |  |  | 0.99; 0.30 |  |  |
| 31 | Newmark Ave at Laclair St |  |  | 1.00; 0.46 |  |  |
| 33 | Thompson Rd at Woodland Dr |  |  |  |  | 1.00; 0.52 |
| 35 | Ocean Blvd at Woodland Dr |  | 0.99; 0.09 |  |  | 0.97; 0.24 |
| 37 | Koosbay Blvd at 10th St |  |  | 0.99; 0.39 |  |  |
| 40 | Commercial Ave at US 101 South | 1.00; 0.48 |  |  |  |  |
| 43 | Central Ave at 7th St | 0.91; 0.08 |  |  |  |  |
| 48 | Hall Ave at US 101 South | 1.00; 0.39 |  |  |  |  |
| 50 | Johnson Ave at US 101 South | 0.91; 0.01 |  |  |  |  |
| 51 | Johnson Ave at US 101 North | 0.98; 0.13 |  |  |  |  |
| 53 | 6th Ave at D St / Coos River Hwy |  |  | 1.00; 0.17 |  |  |

1. Excess Proportion analysis assumed greater than $90 \%$ minimum probability
2. Excess Proportion analysis assumed $10 \%$ minimum excess proportion
[^39]The probability indicates the chance that the long term expected proportion of a specific crash type at a certain intersection will be greater than the long term expected proportion of the same crash type at other intersections of the same type in the study area.

The greater the excess proportion value, the greater likelihood that the site will benefit from a countermeasure targeted at the collision type under consideration. ${ }^{[2]}$

For instance, at the intersection of Commercial Avenue at US 101 South, there is a $100 \%$ chance that the long term expected proportion of angle crashes would be greater than the long term expected proportion of angle crashes at three-legged signalized intersections when compared to the rest of the three-legged signalized intersections in the study area. In addition, the 0.48 value of excess proportion for this intersection, which is the highest among other three-legged signalized intersections that have a probability of over 90 percent for the angle crash type, indicates that the likelihood that this intersection benefits from a countermeasure targeted at the angle crash type is greater than other same-type intersections.

It should be noted that there are five intersections with two specific crash types with a probability of more than 90 percent: Virginia Avenue at US 101 South, Broadway Street at Newmark Avenue, Newmark Avenue at Brusells Street, Newmark Street at Sherman Avenue, and Ocean Boulevard at Woodland Drive.

## Pedestrian Crash Trends

Between 2012 and 2016, there were 36 document crashes involving pedestrians in the study area. The most common reason for the crash was due to vehicles not yielding the right-of-way, with the next most common cause being the pedestrian was illegally in the roadway. Figure 9 summarizes the locations.

In North Bend, there were 21 documented crashes involving pedestrians, two of which were fatalities. Of the 15 pedestrian crashes in Coos Bay, one resulted in a fatality. The majority of pedestrian crashes occurred in commercial or downtown areas. There was one on US 101 between the Coos Bay UGBs.

## Bicycle Crash Trends

Between 2012 and 2016, there were 18 documented crashes involving bicyclists (referred to as pedalcyclists) in North Bend and 18 crashes involving bicyclists in Coos Bay. Between both Cities, none of the crashes involving pedal-cyclists resulted in fatalities. Pedal-cyclist crashes represent roughly two-percent of all documented crashes in North Bend and Coos Bay between 2012 and 2016. Figure 10 displays the location of each bicycle crash in North Bend and Coos Bay.

Additionally, a heat map analysis of the density of crashes was created to show 5 -year bicycle crash patterns (Figure 11). The heat map analysis shows a high incidence of bicycle crashes in downtown Coos Bay around Central Avenue and around the intersection of Broadway Avenue and Newmark Avenue in North Bend. In addition, the analysis illustrates a medium incidence of bicycle crashes around Newmark Avenue and Ocean Boulevard in Coos Bay, and along Virginia Avenue in North Bend. The heat map is based on bicycle crashes, and thus tends to identify hot-spots where bicycle crashes are more common but does not distinguish the crash rate relative to total traffic volumes and is not intended to substitute for Critical Crash Rate or Excess Proportion Crash Location analysis.

[^40]

Urban Growth Boundary (UGB)

## Severity

- Non-Fatal
- Fatal


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

Figure 9. Five-Year Pedestrian Crashes

Coos Bay/ North Bend TSP


Urban Growth Boundary (UGB)

- Bicycle Crashes (Non-Fatal)

Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

Coos Bay/ North Bend TSP

:-............. Urban Growth Boundary (UGB)
Five Year Bicycle Crash Pattern FrequencyLow Medium

High
Very High


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Safety Priority Index System

The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while considering traffic volume. When a segment is ranked in the top $10 \%$ of the index, a crash analysis is typically warranted and corrective actions are considered. Table 9 and Table 10 summarize these locations on State facilities and off-State facilities, respectively.

In North Bend, there are six top 10\% SPIS locations. In Coos Bay, there three top 10\% SPIS locations. The sections of US 101 and Newport Lane/Coos River Highway (OR 241) connecting the Coos Bay UGB has two top 10\% SPIS locations.

Table 9. Top 10\% SPIS Sites - State Facilities (2016)

| Highway | Cross Street | Beginning Mile Point | End <br> Mile <br> Point | ADT | Total Crashes | Fatal \& Injury A ${ }^{1}$ Crashes | City |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| US 101 | California Ave | 235.31 | 235.49 | 9,900 | 43 | 0 | North Bend |
| US 101 | Newmark St | 236.41 | 236.59 | 20,600 | 32 | 1 | North Bend |
| US 101 | Kruse Ave | 238.98 | 239.09 | 17,511 | 6 | 2 | Coos Bay |
| US 101 | Harriet Rd | 239.28 | 239.47 | 26,300 | 26 | 2 | Coos County |
| OR 540 | McPherson Ave | 0.07 | 0.25 | 16,000 | 19 | 2 | North Bend |
| OR 540 | State St | 1.69 | 1.87 | 18,300 | 35 | 3 | North Bend |
| OR 241 | Ellen St | 0.09 | 0.19 | 9,033 | 13 | 1 | Coos County |

Source: ODOT SPIS Report

1. Incapacitating or serious Injury

Table 10. Top 10\% SPIS Sites - Off-State Facilities (2016)

| Road Name | Cross Street(s) | ADT | Total <br> Crashes | Fatal \& Injury <br> A $^{1}$ Crashes | City |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Sherman Ave | Commercial St - Exchange St | 6,000 | 10 | 1 | North Bend |
| Newmark St | Brussels St | 13,800 | 11 | 1 | North Bend |
| S 10 | th St | Commercial Ave | 5,000 | 11 | 1 |
| Ingersoll St | S 2nd St | 1,100 | 5 | 1 | Coos Bay |
| Source: ODOT SPIS Report <br> 1. Incapacitating or serious Injury |  |  |  |  |  |

## Summary of Existing Deficiencies

This memorandum and Technical Memorandum \#4: System Inventory, identified deficiencies in connectivity, operations, conditions and safety for various aspects of the current transportation system. The concerns for each mode are summarized below.

## Pedestrian

- In reviewing arterials and collectors, the streets with significant sidewalk gaps on both sides are Oak Street, Lakeshore Drive
- Important pedestrian routes such as Virginia Avenue, Newmark Avenue, Ocean Boulevard, Newport Lane/Coos River Highway (OR 241) measured at PLTS 4
- PLTS 2 or better preferred near in the downtown core, near medical facilities, assisted living/retirement centers, schools and transit stops.
- Trail or share-use paths system lacking connections between neighborhoods and commercial areas.


## Bicycle

- Segments with BLTS 4 on Cape Arago Highway, Newmark Avenue, Ocean Boulevard and US 101.
- Limited to no formal bicycle facilities throughout most City streets in North Bend and Coos Bay


## Transit

- Limited or incomplete bicycle/pedestrian access to transit stops.
- No weekend fixed-route service.
- Transit service could be improved with decreased headways and additional route along US 101, Ocean Boulevard and Sherman Avenue.


## Bridges

- Functionally Obsolete:
- Coos Bay, Hwy 9 (US 101) (McCullough)
- Catching Slough, Hwy 241
- Hwy 241 over CBRL
- Structurally Deficient:
- Isthmus Slough, Hwy 241 (Eastside)


## Motor Vehicle

- Limited east-west connectivity between Broadway Avenue and Sherman Avenue
- None of the study area intersections currently exceeds applicable mobility targets; however, the intersections of Broadway Street at Newmark Avenue, $7^{\text {th }}$ Street at Anderson Avenue, Hall Avenue at US 101 North and Johnson Avenue at US 101 South have certain movements where drivers will experience delays during the PM Peak Hour.
- Poor pavement condition (2015 data) on California Avenue, between Sherman Avenue, US 101 and the dock facility, on Sheridan Avenue between US 101 and the port facility, and Maple Leaf/Maple Street between Airport Way and Virginia Avenue.
- Functional classification: "collector" term should be renamed as "major collector" and "neighborhood route" should be renamed as "minor collector" for consistency with State and

Federal classifications. Coos Bay's classification of Koosbay Boulevard between $10^{\text {th }}$ Street and US 101 (arterial) differs from the State's classification as an urban collector.

- Both Cities have Pavement Management Plans and citizen concerns of potholes on local streets.
- North Bend arterials and collectors with fair or worse pavement conditions (as defined by North Bend Pavement Management Plan, 2014): Newmark Street (Sheridan Avenue to US 101), Harrison Avenue, Arthur Street, Colorado Avenue, Brussells Street, Oak Street, $17^{\text {th }}$ Street $16^{\text {th }}$ Street, Pacific Street and Crowell Lane. Sections of Broadway/Cape Arago Highway (OR 240) from Virginia Avenue to West city limits.
- Coos Bay arterials and collectors with critical PCI (as defined by Coos Bay Pavement Condition Survey, 2015)): Central Avenue, Southwest Boulevard, Koosbay Boulevard, Blanco Avenue, Radar Road, Schoneman Street, LaClair Street, F Street, Butler Road, Juniper Avenue and Fulton Avenue.


## Freight

- Two high priority Highway Over-Dimension Load Pinch Points (HOLPP):
- US 101 MP 236.28, Lewis Street signal head in North Bend - The signal currently is 4" below the minimum height requirement for both directions.
- US 101 MP 238.40, Curtis Avenue signal head in Coos Bay - The signal head clearance is currently 17'-0" in both directions.
- Highest heavy vehicles volumes at the following intersections: US 101 at Florida Avenue, Koosbay Boulevard, US 101 South at Commercial Avenue and US 101 North at Johnson Avenue.
- Mixing of bike traffic and freight on Maple Leaf Avenue/Maple Street, between Airport Way and Virginia Avenue.
- Rail crossing safety at port and dock facilities on California Avenue and Sheridan Avenue.
- Turning movement radii for US 101 one-way couplet in North Bend.

Air

- No direct commercial passenger service between OTH and northwest hubs (Portland, Oregon).
- OTH is not served by any local public transportation service.


## Marine

- The Cities' Comprehensive Plans identify need for additional port facilities, given current levels of activity and its importance to the region and a need for additional capacity for commercial fishing and recreational boats in the Bay Area.

Rail

- No passenger rail service is available in the study area; the closest available is AMTRAK located in Eugene, Oregon
- Two at-grade crossings do not have warning devices: Market Avenue at Front Street and US 101 at US Plywood-Central Dock Road.


## Safety

- Ten intersections in the study area have observed crash rates that exceed the Statewide $90^{\text {th }}$ Percentile Crash Rate, five of which also exceed the critical crash rate.
- There are five top $10 \%$ SPIS sites on State facilities, and four off-State facilities.
- Newmark Street at Sherman Avenue and Newmark Avenue at Broadway Street suffer from two specific crash types with a probability of more than 90 percent.
- There are five intersections with two specific crash types with a probability of more than 90 percent.


# TECHNICAL MEMORANDUM \#6 APPENDIX 

Draft Current System Conditions (Task 5.5)

Appendix A Traffic Methodology Memo (Technical Memorandum \#5) See Final TM 5
Appendix B Volumes
Appendix C Volume Development
Appendix D Synchro Worksheets
Appendix E Crash Data and Calculations

## Appendix A

Traffic Methodology Memo (Technical Memorandum \#5)
See Final TM 5

## Appendix B

Volumes

```
Project: CBNB
Job \#: ODOT00000925
Subject: PM Turning Movement Volumes
Created: 6/12/2018
```

|  |  |  |  |  | Updated: | 1012412018 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E-WID | Synchro ID | Intersection | Direction | Movement | 2:00 PM | 2:15 PM | $\begin{array}{\|c\|} \hline 2: 30 \mathrm{PM} \\ \hline 0 \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \text { 2:45 PM } \\ \hline \end{array}$ | 3:00 PM | $\begin{array}{\|c\|} \hline \text { 3:15 PM } \\ \hline 0 \end{array}$ | $\begin{array}{\|l\|} \hline \text { 3:30 PM } \\ \hline \end{array}$ | 3:45 PM | 4:00 PM | $\begin{array}{\|c\|} \hline \text { 4:15 PM } \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 4: 30 \mathrm{PM} \\ \hline \\ \hline \end{array}$ | 4:45 PM | 5:00 PM | 5:15 PM | $\begin{array}{\|c\|:\|c\|} \hline \mathrm{PM} \\ \hline \end{array}$ | 5:45 PM | Max |
| $\bar{\square}$ | 10 A | Athur Stat Colorado Loop | EB |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 10 |  |  | EBt | 2 | 4 | 3 | 0 | 0 | 1 | 1 | 4 | 5 | 4 | 1 | 1 | 1 | 2 | 2 | 2 |  |
|  | 10 C | Count Date : 07/11/2017 <br> 2017 |  | EBR | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |  |
|  | 102 |  |  | WBL | 2 | 2 | 2 | 0 | 1 | 2 | 3 | 2 | 0 | 1 | 1 | 1 | 3 | 3 | 3 | 1 |  |
|  | 10 |  | wB | WBT | 2 | 3 | 1 | 0 | 0 | 4 | 3 | 6 | 1 | 5 | 1 | 3 | 1 | 2 | 0 | 5 |  |
|  | 10 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 10 P | PM Peak Hour: 3:30 PM-4:30 PM |  | NBL | 1 | 0 | 1 | 0 | 0 | 0 | 1 | , | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |  |
|  | 10 P | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 10 V | Volume Difference: 14 |  | NBR | 5 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 3 | 0 | 0 | 5 | 4 | 1 | 0 | 4 |  |
|  | 10 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 |  |
|  | 10 P | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |
|  | $10 \quad 0$ | 0.73 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV 32 | 32 | 15 min SUM |  | 12 | 9 | 8 | 0 | 1 | 9 | 12 | 15 | 9 | 10 | 3 | 11 | 10 | 8 | 5 | 13 |  |
|  | Max 15 min 1 | 11 | TEV |  |  |  |  | 29 | 18 | 18 | 22 | 37 | 45 | 46 | 37 | 33 | 34 | 32 | 34 | 36 | 46 |
| 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 20 O | Oak StW Airport Way at Colorado Ave/Maple Leaf |  | EBL | 2 | 0 | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |  |
|  | 20 |  | EB | EBT | 25 | 13 | 24 | 16 | 13 | 17 | 14 | 14 | 27 | 20 | 51 | 21 | 34 | 14 | 18 | 13 |  |
|  | $20 \quad \mathrm{C}$ | Count Date : 07/11/2017 2017 |  | EBR | 4 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 10 | 0 | 1 | 0 |  |
|  | 202 |  |  | WBL | 0 | 0 | 0 | 0 | 1 |  | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |  |
|  | 20 |  | wB | WBT | 22 | 10 | 13 | 14 | 18 | 24 | 11 | 13 | 17 | 9 | 12 | 10 | 14 | 16 | 7 | 18 |  |
|  | 20 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |  |
|  | 20 | PM Peak Hour: 4:15 PM-5:15 PM PM Peak Hour Used: 4:30 PM-5:30 PM Volume Difference: 5 |  | NBL | 3 | 3 | 0 | 1 | 0 |  | 1 | 1 | 2 | 3 | 1 | 0 | 2 | 2 | 2 | 1 |  |
|  | 20 P |  | NB | NBT | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |  |
|  | 20 V |  |  | NBR | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |  |
|  | 20 |  |  | SBL | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  | 20 P | PHF: | SB | SBT | 0 | 0 | 0 | 1 | 0 | 1 | 0 | , | 0 | 0 | 0 | 0 | 1 | 1 | 0 |  |  |
|  | 20 | 0.75 |  | SBR | 1 | 0 | 0 | 1 | 0 | , | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  | PHV | 197 | 15 min SUM |  | 60 | 28 | 44 | 35 | 36 | 51 | 34 | 33 | 55 | 41 | 66 | 32 | 63 | 36 | 33 | 35 |  |
|  | Max 15 min 6 | 66 | TEV |  |  |  |  | 167 | 143 | 166 | 156 | 154 | 173 | 163 | 195 | 194 | 202 | 197 | 164 | 167 | 202 |
| 3 |  | Maple Leaf at E Airport Way |  | EBL |  | 0 | 1 | 0 | 0 |  |  | 0 |  | 0 |  | 0 | 0 | 0 |  |  |  |
|  | 30 |  | EB | EBT | 27 | 14 | 25 | 17 | 15 | 19 | 16 | 14 | 27 | 20 | 53 | 22 | 35 | 17 | 21 | 11 |  |
|  | 30 | Count Date: 07/11/2017 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 302 |  |  | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 30 |  | wB | wBt | 22 | 11 | 13 | 13 | 22 | 25 | 14 | 16 | 19 | 12 | 15 | 10 | 17 | 21 | 12 | 17 |  |
|  | 30 |  |  | WBR | 2 | 2 | 2 | 4 | 0 | 3 | 4 | 4 | 4 | 2 | 0 | 2 | 0 | 2 | 1 | 3 |  |
|  | 30 P | PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM Volume Difference: 0 | NB | NBL | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |
|  | 30 P |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | , | 0 | 0 | 0 |  | 0 |  |
|  | 30 V |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 30 |  | SB | SBL | 3 | 1 | 4 | 2 | 1 | 2 | 4 | 4 | 6 | 3 | 2 | 2 | 4 | 4 | 1 | 0 |  |
|  | 30 | PHF: |  | SBt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | , | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |  |
|  | $30 \quad 0$ | 0.74 |  | SBR | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV ${ }_{2}{ }^{2}$ <br> $M a x 15$ min | 206 | 15 min SUM |  | 56 | 29 | 46 | 36 | 38 | 50 | 38 | 38 | 56 | 38 | 70 | 36 | 56 | 44 | 35 | 31 |  |
|  |  |  | TEV |  |  |  |  | 167 | 149 | 170 | 162 | 164 | 182 | 170 | 202 | 200 | 200 | 206 | 171 | 166 | 206 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | 40 | US 101 at Florida Ave |  | EBL | ${ }^{45}$ | 52 | 45 | ${ }^{44}$ | 41 | 51 | 39 | 54 | ${ }^{53}$ | 45 | 56 | 54 | 61 | ${ }^{73}$ | 77 | 50 |  |
|  | 40 |  | EB | EBT | 1 | 0 | 0 | 0 | 1 | 2 | 0 |  | 0 | 2 | 0 | 0 | 1 | , | 0 | 0 |  |
|  | 40 | Count Date : 07/11/2017 2017 |  | EBR | 1 | 2 | 4 | 1 | 4 | 0 | 0 | 2 | 2 | 1 | 3 | 2 | 5 | 1 | 0 | 0 |  |
|  | 402 |  |  | WBL | 5 | 4 | 4 | 7 | 6 | 6 | 5 | 2 | 6 | 5 |  | 5 | 7 | 5 |  |  |  |
|  | 40 |  | wB | wBt | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |  |
|  | 40 |  |  | WBR | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 |  |
|  | 40 P | PM Peak Hour: 4:15 PM-5:15 PM PM Peak Hour Used: : :30 PM-5:30 PM Volume Difference: 14 | NB | NBL | 1 | 4 | 3 | 2 | 0 | 3 | 3 | 3 | 2 | 0 | 6 | ${ }^{3}$ | 1 | 2 | 1 | 1 |  |
|  | 40 P |  |  | NBT | 148 | 165 | 141 | 160 | 144 | 157 | 126 | 173 | 130 | 179 | 151 | 130 | 203 | 188 | 133 | 138 |  |
|  | $\begin{array}{ll}40 & \\ 40 & \\ 40 & \\ 40 & \\ 40\end{array}$ |  |  | NBR | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  |  |  | SB | SBL | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  |  | $\begin{aligned} & \text { PHF: } \\ & 0.92 \end{aligned}$ |  | SBT | 174 | 150 | 186 | 176 | 215 | 185 | 183 | 173 | 222 | 207 | 187 | 209 | 185 | 156 | 155 | 158 |  |
|  |  |  |  | SBR | 1 |  | 3 | 3 | , | 4 | 3 | 4 | 5 | 3 | 3 | 4 | , | 3 | 5 | 0 |  |
|  | $\begin{array}{\|c\|} \hline \text { PHV } \\ \text { Max } 15 \text { min } \end{array}$ | $\begin{aligned} & \hline 1711 \\ & 466 \end{aligned}$ | 15 min SUM |  | 377 | 381 | 388 | 394 | 413 | 409 | 361 | 412 | 420 | 442 | 408 | 409 | 466 | 428 | 383 | 350 |  |
|  |  |  | TEV |  |  |  |  | 1540 | 1576 | 1604 | 1577 | 1595 | 1602 | 1635 | 1682 | 1679 | 1725 | 1711 | 1686 | 1627 | 1725 |
| 5 |  | Virginia Ave at Arthur St |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 50 |  |  | EBL | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 1 | $\stackrel{2}{2}$ | 1 | 1 | 1 |  |
|  | 50 |  | EB | EBT | 20 | 23 | 28 | 27 | 22 | 30 | 24 | 31 | 28 | 23 | 25 | 30 | 20 | 25 | 19 | 20 |  |
|  | 50 | Count Date: 07/11/2017 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 50 |  |  | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 50 |  | wB | wbt | 25 | 31 | 27 | 24 | 27 | 30 | 31 | 38 | 31 | 40 | 32 | 32 | 41 | 44 | 30 | 31 |  |
|  | 50 |  |  | WBR | 4 | 2 | 0 | 4 | 5 | 1 | 2 | 0 | 5 | 3 | 3 | 5 | 2 | 8 | 1 | 4 |  |
|  | 50 | PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: : 4:30 PM-5:30 PM Volume Difference: 0 | NB | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 50 |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 50 |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 50 |  | SB | SBL |  | 2 | 2 | 1 | 3 | 4 | 5 | 2 | 4 | 2 |  | 2 | 0 | ${ }^{3}$ | 2 | 1 |  |
|  | 50 | PHF: |  | SBT | 0 |  | 0 | 0 |  | - | 0 | , | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 50 | 0.87 |  | SBR | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 |  |
|  | PHV <br> Max 15 min | 282 | 15 min SUM |  | 51 | 59 | 57 | 57 | 57 | 68 | 64 | 72 | 69 | 68 | 64 | 72 | 65 | 81 | 54 | 58 |  |
|  |  |  | TEV |  |  |  |  | 224 | 230 | 239 | 246 | 261 | 273 | 273 | 273 | 273 | 269 | 282 | 272 | 258 | 282 |
| 6 |  | Virginia Ave at Oak St <br> Count Date : 07/11/2017 2017 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 v |  | EB | EBL | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 0 |  |
|  | 60 |  |  | EBt | 37 | 32 | 33 | 41 | 39 | 49 | 40 | 45 | 42 | 32 | 43 | 54 | 28 | 44 | 43 | 33 |  |
|  | $\begin{array}{ll}60 & \\ 60 & \text { C } \\ 60 & 2017 \\ 60 & \end{array}$ |  |  | EBR | 3 | 5 | 4 | 5 | 5 | 3 | 6 | 3 | 7 | 10 | 5 | 4 | 5 | 3 | 2 | 4 |  |
|  |  |  |  | WBL | 10 | 11 | 9 | 8 | 4 | 8 | 12 | 9 | 8 | 16 | 9 | 15 | 10 | 12 | 17 | 7 |  |
|  |  |  | wB | wBt | 41 | 40 | 35 | 43 | 48 | 48 | 47 | 60 | 58 | 48 | 60 | 67 | 69 | 66 | 49 | 58 |  |
|  | 60 |  |  | WBR | 1 | 2 |  | 3 | 2 | 3 | 3 |  | 1 | 3 |  | 3 | 4 | 3 |  | 6 |  |
|  | 60 P | PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM Volume Difference: 0 |  | NBL | 4 | 0 | 7 | 9 | 5 | 6 | 5 | 6 |  | 8 | 5 | 0 | 8 | 15 |  | 9 |  |
|  | 60 P |  | NB | NBT | 5 | 5 | 3 | 0 | 1 | 2 | 2 |  | 7 | 3 |  | 3 | 2 | 5 | 2 | 2 |  |
|  | 60 V |  |  | NBR | 12 | 10 | 9 | 2 | 11 | 11 | 14 | 11 | 7 | 4 | 7 | 5 | 10 | 10 | 12 | 6 |  |



Updated: 10/24/2018

| E-W ID | Synchro ID | Intersection | Direction | Movement | 2:00 PM | 2:15 PM | 2:30 PM | 2:45 PM | 3:00 PM | 3:15 PM | 3:30 PM | 3:45 PM | 4:00 PM | 4:15 PM | 4:30 PM | 4:45 PM | 5:00 PM | 5:15 PM | 5:30 PM | 5:45 PM | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 120 | 2017 |  | WBL | 4 | 9 | 7 | 6 | 6 | 11 | 9 | 6 | 11 | 10 | 10 | 14 | 18 | 16 | 8 | 12 |  |
|  | 120 |  | wB | WBT | 61 | 64 | 68 | 82 | 75 | 60 | 62 | 65 | 80 | 96 | 74 | 75 | 94 | 88 | 64 | 64 |  |
|  | 120 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 120 | PM Peak Hour: 4:15 PM-5:15 PM |  | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 120 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 120 | Volume Difference: 59 |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 120 |  |  | SBL | 8 | 6 | 6 | 6 | 1 | 2 | 2 | 3 | 3 | 4 | 2 | 1 | 3 | 1 | 1 | 1 |  |
|  | 120 | PHF: | SB | SBT | 123 | 110 | 133 | 134 | 164 | 138 | 133 | 130 | 156 | 184 | 134 | 152 | 180 | 133 | 114 | 105 |  |
|  | 120 | 0.92 |  | SBR | 79 | 53 | 66 | 70 | 82 | 81 | 81 | 75 | 93 | 79 | 69 | 75 | 71 | 67 | 75 | 70 |  |
|  | PHV | 1744 | 15 min SUM |  | 373 | 361 | 393 | 409 | 433 | 402 | 399 | 380 | 443 | 482 | 414 | 433 | 474 | 423 | 365 | 352 |  |
|  | Max 15 min | 474 | TEV |  |  |  |  | 1536 | 1596 | 1637 | 1643 | 1614 | 1624 | 1704 | 1719 | 1772 | 1803 | 1744 | 1695 | 1614 | 1803 |
| $13$ |  | Virginia Ave atUS 101 North |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 130 |  | EB | EBL | 31 | 46 | 43 | 48 | 46 | 34 | 45 | 35 | 33 | 54 | 41 | 36 | 34 | 44 | 34 | 38 |  |
|  | 130 |  |  | EBt | 11 | 11 | 5 | 7 | 3 | 7 | 3 | 6 | 5 | 1 | 4 | 5 | 3 | 2 | 1 | 3 |  |
|  | 130 | Count Date : 07/11/2017 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 130 |  | WB | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 130 |  |  | WBT | 9 | 8 | 5 | 2 | 7 | 9 | 10 | 13 | 16 | 15 | 14 | 11 | 28 | 13 | 5 | 9 |  |
|  | 130 |  |  | WBR |  | 2 | 2 | 1 | 1 | 2 | 0 | 0 | 2 | 0 | 2 | 1 | 6 | 2 | 1 | 0 |  |
|  | 130 | PM Peak Hour: 4:30 PM-5:30 PM | NB | NBL | 64 | 65 | 66 | 82 | 73 | 62 | 68 | 56 | 78 | 86 | 73 | 84 | 79 | 90 | 67 | 68 |  |
|  | 130 | PM Peak Hour Used: 4:30 PM-5:30 PM |  | NBT | 134 | 153 | 129 | 146 | 119 | 130 | 122 | 161 | 126 | 130 | 141 | 106 | 185 | 159 | 117 | 118 |  |
|  | 130 | Volume Difference: 0 |  | NBR | 2 | 5 | 2 | 7 | 3 | 9 | 8 | 7 | 3 | 3 | 2 | 1 | 2 | 1 | 0 | 2 |  |
|  | 130 |  | SB | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 130 | PHF: |  | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 130 | 0.87 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV | 1169 | 15 min SUM |  | 253 | 290 | 252 | 293 | 252 | 253 | 256 | 278 | 263 | 289 | 277 | 244 | 337 | 311 | 225 | 238 |  |
|  | Max 15 min | 337 | TEV |  |  |  |  | 1088 | 1087 | 1050 | 1054 | 1039 | 1050 | 1086 | 1107 | 1073 | 1147 | 1169 | 1117 | 1111 | 1169 |
| ${ }^{14}$ |  | Marion Ave atSafeway Drway | EB |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 140 |  |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 140 |  |  | EBt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 140 | Count Date :07111/20172017 |  | EBR | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 140 |  | WB | WBL | 27 | 21 | 18 | 21 | 23 | 16 | 19 | 24 | 20 | 25 | 22 | 28 | 24 | 18 | 40 | 25 |  |
|  | 140 |  |  | WBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 140 |  |  | WBR | 12 | 11 | 9 | 10 | 15 | 13 | 16 | 20 | 11 | 9 | 17 | 15 | 13 | 11 | 18 | 16 |  |
|  | 140 | PM Peak Hour. 4:45 PM-5:45 PM | NB | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 140 | PM Peak Hour Used: 4:30 PM-5:30 PM |  | NBT | 9 | 7 | 5 | 10 | 7 | 6 | 9 | 6 | 8 | 3 | 8 | 6 | 8 | 4 | 6 | 5 |  |
|  | 140 | Volume Difference: 9 |  | NBR | 11 | 11 | 14 | 11 | 13 | 8 | 25 | 20 | 9 | 13 | 15 | 16 | 13 | 14 | 11 | 7 |  |
|  | 140 |  | SB | SBL | 12 | 14 | 10 | 14 | 20 | 18 | 10 | 19 | 12 | 11 | 16 | 11 | 17 | 17 | 16 | 11 |  |
|  | 140 | PHF: |  | SBT | 12 | 10 | 8 |  |  | 8 | 9 | 6 |  | 8 | 9 | 6 | 10 | 9 | 5 | 6 |  |
|  | 140 | 0.94 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV <br> Max 15 min | 327 | 15 min SUM |  | 83 | 74 | 64 | 70 | 83 | 69 | 88 | 95 | 63 | 69 | 87 | 82 | 85 | 73 | 96 | 70 |  |
|  |  | 87 | TEV |  |  |  |  | 291 | 291 | 286 | 310 | 335 | 315 | 315 | 314 | 301 | 323 | 327 | 336 | 324 | 336 |
| 15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 150 | Washington Ave at US 101 South/Sherman Ave | EB | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 150 |  |  | EBT | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 |  |
|  | 150 |  |  | EBRish | 2 | 4 | 3 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 1 |  |
|  | 150 | Count Date :07/122120172017 |  | EBR | 0 | 1 | 4 | 0 | 3 | 6 | 0 | 2 | 2 | 2 | 0 | 1 | 2 | 1 | 2 | 3 |  |
|  | 150 |  | WB | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 150 |  |  | WBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 150 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |  |
|  | 150 | PM Peak Hour: 4:15 PM-5:15 PM <br> PM Peak Hour Used: 4:30 PM-5:30 PM <br> Volume Difference: 60 | NB | NBL | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 150 |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 150 |  |  | NBR | 10 | 15 | 24 | 8 | 20 | 23 | 22 | 15 | 21 | 26 | 19 | 29 | 24 | 15 | 18 | 20 |  |
|  | 150 |  |  | NBRish |  | 6 | 0 | 0 | 1 | 1 | 1 | 4 | 1 | 3 | 3 | 3 | 1 | 3 | 3 | 3 |  |
|  | 150 |  | SB | SBL | 5 | 4 | 8 | 6 | 3 | 3 | 7 | 4 | 4 | 6 | 4 | 4 | 3 | 4 | 5 | 7 |  |
|  | 150 |  |  | SBTish | 182 | 193 | 171 | 150 | 206 | 181 | 185 | 200 | 179 | 189 | 196 | 191 | 207 | 160 | 146 | 146 |  |
|  | 150 | PHF: |  | SBT | 30 | 28 | 26 | 34 | 33 | 27 | 37 | 29 | 20 | 44 | 29 | 42 | 25 | 27 | 42 | 30 |  |
|  | 150 | 0.92 |  | SBR | 1 | 1 | 2 | 3 | 2 | 1 | 6 | 3 | 1 | 5 | 5 | 2 | 2 | 5 | 1 | 5 |  |
|  | PHV <br> Max 15 min | 1013 | 15 min SUM |  | 233 | 254 | 238 | 202 | 270 | 244 | 261 | 257 | 229 | 275 | 258 | 275 | 265 | 215 | 219 | 216 |  |
|  |  | 275 | TEV |  |  |  |  | 927 | 964 | 954 | 977 | 1032 | 991 | 1022 | 1019 | 1037 | 1073 | 1013 | 974 | 915 | 1073 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 | 160 | Pony Creek Rd at Crowell Lane | EB | EBL | 6 | 1 | 2 | 3 | 10 | 10 | 4 | 6 | 6 | 9 | 3 | 8 | 4 | 15 | 9 | 5 |  |
|  | 160 |  |  | EBt | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 160 | Count Date : 07/11/2017 |  | EBR | 3 | 3 | 7 | 5 | 3 | 5 | 6 | 5 | 4 | 4 | 4 | 8 | 4 | 7 | 6 | 4 |  |
|  | 160 | 2017 | WB | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 160 |  |  | WBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 |  |
|  | 160 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 160 | PM Peak Hour: 4:45 PM-5:45 PM | NB | NBL | 9 | 4 | 4 | 2 | 6 | 5 | 6 | 6 | 2 | 4 | 6 | 8 | 10 | 8 | 9 | 2 |  |
|  | 160 | PM Peak Hour Used: 4:30 PM-5:30 PM |  | NBT | 41 | 39 | 40 | 41 | 30 | 31 | 34 | 44 | 24 | 22 | 28 | 38 | 38 | 44 | 33 | 25 |  |
|  | 160 | Volume Difference: 18 |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 160 |  | SB | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 160 | PHF: |  | SBT | 49 | 43 | 49 | 49 | 41 | 33 | 19 | 33 | 66 | 32 | 33 | 30 | 27 | 41 | 39 | 28 |  |
|  | 160 | 0.78 |  | SBR | 3 | 1 | 3 | 7 | 7 | 11 | 10 | 10 | 8 | 8 | 11 | 8 | 5 | 14 | 7 | 5 |  |
|  | PHV <br> Max 15 min | 402 | 15 min SUM |  | 111 | 91 | 105 | 107 | 97 | 95 | 79 | 104 | 110 | 79 | 85 | 100 | 88 | 129 | 103 | 69 |  |
|  |  | 129 | TEV |  |  |  |  | 414 | 400 | 404 | 378 | 375 | 388 | 372 | 378 | 374 | 352 | 402 | 420 | 389 | 420 |
| 17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 170 | Oak Stat 16th/17th St | EB | EBL | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 1 | 0 | 2 | 0 | 4 | 4 | 1 |  |
|  | 170 |  |  | EBt |  | 4 | 4 | 6 |  | 8 | 2 | 12 | 7 | 7 | 4 | 7 | 5 | 5 | 5 | 4 |  |
|  | 170 | Count Date : 07/11/2017 2017 |  | EBR | 8 | 7 | 7 | 9 | 6 | 4 | 9 | 7 | 13 | 8 | 1 | 6 | 4 | 10 | 5 | 3 |  |
|  | 170 |  | wB | WBL | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 4 | 0 | 2 | 1 | 4 |  |
|  | 170 |  |  | WBT | 10 | 6 | 12 | 8 | 10 | 13 | 7 | 13 | 8 | 8 | 10 | 14 | 11 | 13 |  | 9 |  |
|  | 170 |  |  | WBR | 1 | 0 | 3 | 2 | 4 | 2 | 2 | 4 | 2 | 5 | 1 | 3 | 4 | 3 | 4 | 4 |  |
|  | 170 | PM Peak Hour: 4:45 PM-5:45 PM <br> PM Peak Hour Used: 4:30 PM-5:30 PM <br> Volume Difference: 10 |  | NBL | 2 | 7 | 4 | 2 | 8 | 6 | 7 | 6 | 8 | 7 | 5 | 5 | 13 | 5 | 7 | 11 |  |
|  | 170 |  | NB | NBT | 13 | 9 | 17 | 10 | 15 | 8 | 17 | 13 | 13 | 9 | 7 | 15 | 18 | 17 | 10 | 20 |  |
|  | 170 |  |  | NBR | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 5 | 0 |  |

Project: CBNB
Job \#: ODOT00000925
Subject: PM Turning Movement Volumes
Created: 6/12/2018

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 170 |  |  | SBL | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 2 | 1 | 1 | 0 | 1 |  |
|  | 170 | PHF: | SB | SBT | 10 | 9 | 16 | 15 | 8 | 14 | 17 | 9 | 16 | 14 | 14 | 14 | 14 | 16 | 13 | 9 |  |
|  | 170 | 0.86 |  | SBR | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 4 | 2 | 1 | 1 | 0 | 0 | 3 |  |
|  | PHV | 271 | 15 min SUM |  | 51 | 47 | 66 | 56 | 61 | 61 | 63 | 68 | 72 | 66 | 48 | 73 | 71 | 79 | 58 | 69 |  |
|  | Max 15 min 7 | 79 | TEV |  |  |  |  | 220 | 230 | 244 | 241 | 253 | 264 | 269 | 254 | 259 | 258 | 271 | 281 | 277 | 281 |
| 18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 180 | Broadway Stat 16th St | EB | EBL | 4 | 3 | 3 | 4 | 3 | 3 | 6 | 4 | 8 | 3 | 3 | 8 | 5 | 7 | 3 | 3 |  |
|  | 180 |  |  | EBt | 3 | 0 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 2 | 2 | 4 | 4 | 3 | 4 | 3 |  |
|  | 180 | Count Date : 07/11/2017 <br> 2017 |  | EBR | 3 | 1 | 1 | 0 | 0 | 1 | 2 | 3 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |  |
|  | 1802 |  | wB | WBL | 29 | 25 | ${ }^{21}$ | 19 | ${ }^{23}$ | 26 | 17 | 29 | 15 | 20 | ${ }^{24}$ | 22 | 11 | ${ }^{26}$ | ${ }^{24}$ | ${ }^{23}$ |  |
|  | 180 |  |  | wBt | 4 | 1 | 2 | 5 | 1 | 3 | 3 | 2 | 2 | 3 | 6 | 7 | 3 | 5 | 5 | 5 |  |
|  | 180 |  |  | WBR | 2 | 1 | 1 | 0 | 5 | 5 | 3 | 5 | 0 | 1 | 4 | 2 | 3 | 3 | 4 | 0 |  |
|  | 180 | PM Peak Hour: 4:15 PM-5:15 PM | NB | NBL | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 0 | 1 | 3 | 2 | 1 | 4 |  |
|  | 180 | PM Peak Hour Used: 4:30 PM-5:30 PM |  | NBT | 159 | 170 | 157 | 167 | 160 | 167 | 169 | 155 | 174 | 170 | 157 | 145 | 196 | 162 | 153 | 132 |  |
|  | 180 | Volume Difference: 20 |  | NBR | 9 | 12 | 12 | 12 | 4 | 12 | 12 | 12 | 15 | 16 | 8 | 11 | 10 | 13 | 10 | 14 |  |
|  | 180 |  | SB | SBL | 0 | 2 | 2 | 1 | 1 | 3 |  | 3 |  | 2 | 3 | 3 | 3 | , | 1 | 2 |  |
|  | 180 | PHF: |  | SBT | 188 | 158 | 157 | 142 | 161 | 137 | 138 | 169 | 144 | 158 | 165 | 169 | 189 | 130 | 157 | 114 |  |
|  | 180 | 0.89 |  | SBR | 1 | 1 | 2 | 4 | 5 | 0 | 0 | 2 | 3 | 2 | 4 | 7 | 8 | 6 | 3 | 2 |  |
|  | $\begin{array}{\|c\|} \hline \text { PHV } \\ \text { Max } 15 \text { min } \\ \hline \end{array}$ | 1550 | 15 min SUM |  | 404 | 376 | 361 | 356 | 366 | 363 | 355 | 389 | 369 | 378 | 377 | 379 | 436 | 358 | 365 | 302 |  |
|  |  | 436 | TEV |  |  |  |  | 1497 | 1459 | 1446 | 1440 | 1473 | 1476 | 1491 | 1513 | 1503 | 1570 | 1550 | 1538 | 1461 | 1570 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 | 190 | Broadway Ave at 174t St | EB | EBL | ${ }^{2}$ | 1 | 0 | ${ }^{2}$ | 1 | 3 | ${ }^{2}$ | ${ }^{2}$ | 4 | 0 | 5 | 1 | 0 | 0 | 2 | 0 |  |
|  | 190 |  |  | EBt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 190 | Count Date : 07/11/2017 <br> 2017 |  | EBR | 7 | 2 | 4 | 4 | 5 | 3 | 1 | 8 | 1 | 8 | 3 | 5 | 5 | 7 | 3 | 5 |  |
|  | 190 |  | wB | WBL | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 3 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |  |
|  | 190 |  |  | WBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 |  |
|  | 190 |  |  | WBR | 2 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 0 |  | 1 | 3 | 0 | 1 | 2 |  |
|  | 190 | PM Peak Hour: 4:15 PM-5:15 PMPM Peak Hour sused: 4:30 PM-5:30 PMVolume Difference: 22 | NB | NBL | 6 | 8 | 12 | 6 | 7 | 12 | 7 | 11 | 9 | 8 | 7 | 10 | 11 | 12 | 10 | 10 |  |
|  | 190 |  |  | NBT | 174 | 183 | 171 | 177 | 167 | 179 | 178 | 171 | 191 | 180 | 161 | 158 | 205 | 180 | 163 | 150 |  |
|  | 190 |  |  | NBR | 2 | 3 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 3 | 0 | 1 | 0 |  | 0 | 0 |  |
|  | 190 |  | SB | SBL | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |  | 1 | 0 | 0 | 0 | 0 |  |
|  | 190 | PHF: |  | SBT | 216 | 190 | 184 | 160 | 178 | 163 | 158 | 194 | 159 | 181 | 189 | 189 | 204 | 159 | 181 | 132 |  |
|  | 190 | 0.88 |  | SBR | 1 | 1 | 0 | 3 | 1 | 1 | 0 | 4 | 1 | 1 | 0 | 1 | 2 |  | 1 | 6 |  |
|  | PHV | 1526 | 15 min SUM |  | 412 | 389 | 374 | 355 | 363 | 367 | 349 | 392 | 370 | 382 | 366 | 368 | 432 | 360 | 361 | 305 |  |
|  | Max 15 min | 432 | TEV |  |  |  |  | 1530 | 1481 | 1459 | 1434 | 1471 | 1478 | 1493 | 1510 | 1486 | 1548 | 1526 | 1521 | 1458 | 1548 |
| 20 |  | US 101 a a Mill Casino Entrance | EB |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 200 200 |  |  | EBL EBT | 0 1 | 2 | 1 | 1 | 1 | 2 | $\stackrel{2}{2}$ | 2 | 0 1 | 3 0 | 3 | 0 | 2 | 0 | 0 | 0 |  |
|  | 200 | Count Date: $04 / 22 / 2016$ |  | EBR | 2 |  | 2 | 3 | 1 | 0 | 2 |  | 2 | 5 | 1 | 1 | 1 | 4 | 3 | 1 |  |
|  | 200 | 2016 | wB | WBL | 27 | 19 | 19 | 0 | 20 | 15 | 28 | 20 | 17 | ${ }^{26}$ | 18 | 17 | 20 | 20 | 28 | 10 |  |
|  | 200 |  |  | wbt | 1 | 1 | 0 | 2 |  | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  | 200 |  |  | WBR | 9 | 13 | 12 | 10 | 7 | 11 | 9 | 7 | 8 | 9 | 12 | 14 | 11 | 10 | 9 | 1 |  |
|  | 200 P | PM Peak Hour: 2:45 PM-3:45 PM PM Peak Hour Used: 4:30 PM-5:30 PM Volume Difference: 94 | NB | NBL |  | 3 | 3 | 1 | 1 | 0 | 2 | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |  |
|  | 200 P |  |  | NBT | 190 | 189 | 173 | 181 | 174 | 176 | 153 | 159 | 184 | 162 | 200 | 169 | 175 | 182 | 151 | 155 |  |
|  | 200 V |  |  | NBR | 25 | 16 | 21 | 24 | 21 | 16 | 26 | 26 | 19 | 16 | 27 | 19 | 23 | 14 | 16 | 18 |  |
|  | 200 |  | SB | SBL | 6 | 14 | 16 | 13 | 11 | 12 | 10 | 8 | 5 | 10 |  | 7 | 10 | 8 | 8 | 5 |  |
|  | 200 | PHF: |  | SBT | 141 | 154 | 129 | 262 | 164 | 149 | 185 | 163 | 155 | 172 | 164 | 141 | 164 | 161 | 171 | 93 |  |
|  | 200 | 0.93 |  | SBR | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |  |
|  | $\begin{array}{\|c\|} \hline \text { PHV } \\ \text { Max } 15 \text { min } \\ \hline \end{array}$ | 1610 | 15 min SUM |  | 404 | 416 | 377 | 497 | 401 | 386 | 420 | 387 | 395 | 404 | 433 | 368 | 407 | 402 | 388 | 285 |  |
|  |  | 433 | TEV |  |  |  |  | 1694 | 1691 | 1661 | 1704 | 1594 | 1588 | 1606 | 1619 | 1600 | 1612 | 1610 | 1565 | 1482 | 1704 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ${ }^{21}$ | 210 N | Newmark Ave at Oak St | EB | EBL | 12 | 13 | 12 | 12 | 9 | 12 | 13 | 15 | 19 | 11 | 12 | 11 | 21 | 18 | 15 | 16 |  |
|  | 210 |  |  | EBT | 241 | 265 | 231 | 252 | 214 | 270 | 209 | 257 | 263 | 206 | 223 | 199 | 281 | 212 | 217 | 238 |  |
|  | 210 | Count Date : 07/11/2017 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 |  |
|  | $210 \quad 2$ |  | WB | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |  |
|  | 210 |  |  | wBt | 235 | 187 | 239 | 229 | 216 | 198 | 219 | 212 | 204 | 216 | 212 | 223 | 236 | 222 | 201 | 184 |  |
|  | 210 |  |  | WBR | 5 | 6 | 14 | 7 | 18 | 11 | 11 |  | 10 |  | 8 | 17 | 11 | 18 | 12 | 12 |  |
|  | 210 | PM Peak Hour: 2:00 PM-3:00 PM PM Peak Hour Used: : :30 PM-5:30 PM Volume Difference: 38 | NB | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 210 |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 210 |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 210 |  | SB | SBL | 17 | 17 | 13 | 15 | 8 | ${ }^{12}$ | 14 | 9 | 20 | ${ }^{13}$ | 8 | 21 | 9 | 16 | 9 | 10 |  |
|  | 210 | PHF: |  | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 210 | 0.89 |  | SBR | 16 | 11 | 14 | 13 | 14 | 11 | 14 | 11 | 15 | 20 | 12 | 13 | 16 | 19 | 15 | 14 |  |
|  | PHVMax 15 min | 2038 | 15 min SUM |  | 526 | 499 | 523 | 528 | 479 | 514 | 480 | 513 | 531 | 475 | 475 | 484 | 574 | 505 | 469 | 474 |  |
|  |  | 574 | TEV |  |  |  |  | 2076 | 2029 | 2044 | 2001 | 1986 | 2038 | 1999 | 1994 | 1965 | 2008 | 2038 | 2032 | 2022 | 2076 |
| 22 |  | Broadway St at Newmark Ave |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 220 |  | EB | EBL | 107 | 91 | 98 | 117 | 94 | 107 | ${ }^{84}$ | 120 | 110 | 89 | 84 | 88 | 103 | 91 | 94 | 115 |  |
|  | 220 |  |  | EBT | 100 | 130 | 96 | 123 | 99 | 106 | 86 | 123 | 130 | 105 | 116 | 93 | 148 | 109 | 88 | 112 |  |
|  | 220 | Count Date : 07/11/2017 2017 |  | EBR | 50 | 56 | 48 | 58 | 46 | 64 | 38 | 35 | 54 | 38 | 34 | 44 | 52 | 34 | 30 | 45 |  |
|  | 220 |  | WB | WBL | 21 | 25 | 19 | 20 | 11 | 15 | 19 | 17 | 21 | ${ }^{13}$ | 18 | 20 | 11 | 15 | 13 | 7 |  |
|  | 220 |  |  | wBt | 105 | 79 | 78 | 82 | 92 | 104 | 98 | 84 | 81 | 92 | 78 | 82 | 92 | 99 | 95 | 69 |  |
|  | 220 |  |  | WBR | 24 | 25 | 31 | 41 | 39 | 52 | 30 | 28 | 36 | 34 | 27 | 41 | 39 | 44 | 30 | 25 |  |
|  | 220 | PM Peak Hour: : :000 PM-3:00 PM PM Peak Hour Used: : :30 PM-5:30 PM Volume Difference: 54 | NB | NBL | ${ }^{42}$ | 42 | 42 | 42 | 44 | 45 | 39 | 40 | 36 | ${ }^{31}$ | 44 | 47 | 35 | 47 | 32 | 30 |  |
|  | 220 |  |  | NBT | 55 | 78 | 65 | 57 | 52 | 68 | 81 | 63 | 79 | 72 | 74 | 70 | 72 | 78 | 42 | 54 |  |
|  | 220 |  |  | NBR | 10 | 9 | 9 | 15 | 18 | 8 | 10 | 7 | 9 | 11 | 16 | 11 | 13 | 9 | 13 | 11 |  |
|  | 220 |  | SB | SBL | ${ }^{27}$ | 30 | ${ }^{33}$ | 19 | ${ }^{23}$ | 20 | 31 | ${ }^{23}$ | 22 | ${ }^{24}$ | 20 | 28 | 28 | 29 | 25 | 13 |  |
|  | 220 | PHF: |  | SBT | 73 | 76 | 55 | 69 | 61 | 56 | 59 | 58 | 68 | 63 | 67 | 48 | 59 | 59 | 45 | 55 |  |
|  | 220 | 0.93 |  | SBR | 6 | 8 | 4 | 5 | 4 | 2 | 3 | 3 | 3 | 4 | 4 | 12 | 7 | 2 | 1 | 5 |  |
|  | PHV | 2441 | 15 min SUM |  | 620 | 649 | 578 | 648 | 583 | 647 | 578 | 601 | 649 | 576 | 582 | 584 | 659 | 616 | 508 | 541 |  |
|  | Max 15 min |  | TEV |  |  |  |  | 2495 | 2458 | 2456 | 2456 | 2409 | 2475 | 2404 | 2408 | 2391 | 2401 | 2441 | 2367 | 2324 | 2495 |
| ${ }^{23}$ |  | Newmark Stat Edgewood Dr  <br> Count Date : $07 / 111 / 2017$ EB <br>   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 230 230 |  |  | EBL EBT | 0 143 | 0 124 | 0 157 | 0 133 | 0 139 | 0 136 | 0 140 | 0 152 | 0 135 | ${ }_{119}$ | 0 132 | 0 140 | 0 185 | 0 157 | 0 159 | 0 130 |  |
|  | 230 |  |  |  |  |  |  |  | 5 | 6 |  | 3 |  |  |  |  |  |  |  | 6 |  |


|  |  |  |  |  | Updated: | $10124 / 2018$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E-WID | Synchro ID | Intersection | Direction | Movement | 2:00 PM | 2:15 PM | 2:30 PM | 2:45 PM | 3:00 PM | 3:15 PM | 3:30 PM | 3:45 PM | 4:00 PM | 4:15 PM | 4:30 PM | 4:45 PM | 5:00 PM | 5:15 PM | 5:30 PM | 5:45 PM | Max |
|  | 230 | 2017 |  | WBL | 6 | 1 | 4 | 4 | 3 | 6 | 5 | 5 | 4 | 3 | 8 | 5 | 7 | 6 | 5 | 3 |  |
|  | 230 |  | wB | wBt | 123 | 132 | 133 | 111 | 144 | 123 | 137 | 128 | 133 | 101 | 134 | 127 | 123 | 134 | 133 | 114 |  |
|  | 230 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 230 | PM Peak Hour: 4:45 PM-5:45 PM |  | NBL | 6 | 9 | 6 | 10 | 10 | 8 | 5 | 2 | 5 | 4 | 2 | 6 | 7 | 6 | ${ }^{13}$ | 0 |  |
|  | 230 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 230 | Volume Difference: 34 |  | NBR | 5 | 8 | 4 | 4 | 8 | 2 | 9 | 5 | 10 | 6 | 12 | 12 | 11 | 12 | 8 | 11 |  |
|  | 230 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 230 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 230 | 0.92 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV | 1255 | 15 min SUM |  | 291 | 281 | 310 | 270 | 309 | 281 | 304 | 295 | 294 | 236 | 291 | 298 | 340 | 326 | 325 | 264 |  |
|  | Max 15 min | 340 | TEV |  |  |  |  | 1152 | 1170 | 1170 | 1164 | 1189 | 1174 | 1129 | 1116 | 1119 | 1165 | 1255 | 1289 | 1255 | 1289 |
| ${ }^{24}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 240 | Newmark Ave at Brusells St |  | EBL | 19 | 12 | 14 | 16 | 14 | 13 | 16 | 19 | 14 | 11 | 18 | 21 | 22 | 19 | 20 | 13 |  |
|  | 240 |  | EB | EBt | 122 | 150 | 133 | 137 | 133 | 119 | 114 | 145 | 152 | 126 | 131 | 116 | 161 | 141 | 130 | 113 |  |
|  | 240 | Count Date : 07/11/2017 |  | EBR | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 2 | 3 | 1 | 0 | 3 | 1 |  |
|  | 240 | 2017 |  | WBL | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | , | 0 | 0 | 3 | 2 | 0 |  |
|  | 240 |  | wB | wbt | 120 | 112 | 126 | 118 | 119 | 124 | 136 | 120 | 115 | 94 | 110 | 125 | 127 | 146 | 118 | 87 |  |
|  | 240 |  |  | WBR | 27 | 24 | 28 | 20 | 21 | 22 | 16 | 23 | 11 | 14 | 19 | 19 | 23 | 26 | 20 | 23 |  |
|  | 240 | PM Peak Hour: 4:45 PM-5:45 PM |  | NBL | 0 | 3 | 1 | 1 | 2 | 0 | 1 | 0 | 4 | 2 | 2 | 0 | 1 | 2 | 0 | 2 |  |
|  | 240 | PM Peak Hour Used : 4:30 PM-5:30 PM | NB | NBT | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 4 | 1 | 3 | 4 | 0 | 1 |  |
|  | 240 | Volume Difference: 10 |  | NBR | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 1 |  | 3 | 0 | 0 | 1 | 0 |  |
|  | 240 |  |  | SBL | ${ }^{24}$ | 30 | 25 | ${ }^{27}$ | 20 | ${ }^{23}$ | 18 | 19 | ${ }^{24}$ | 12 | 20 | 18 | ${ }^{13}$ | 18 | 20 | ${ }^{23}$ |  |
|  | 240 | PHF: | SB | SBt | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 0 | 2 | 2 | 1 | 2 | 1 | 0 | 0 | 0 |  |
|  | 240 | 0.93 |  | SBR | 23 | 17 | 20 | 26 | 15 | 15 | 12 | 14 | 20 | 24 | 12 | 15 | 19 | 13 | 16 | 14 |  |
|  | PHV | 1386 | 15 min SUM |  | 343 | 352 | 351 | 347 | 327 | 321 | 318 | 342 | 344 | 290 | 320 | 323 | 371 | 372 | 330 | 277 |  |
|  | Max 15 min | 372 | TEV |  |  |  |  | 1393 | 1377 | 1346 | 1313 | 1308 | 1325 | 1294 | 1296 | 1277 | 1304 | 1386 | 1396 | 1350 | 1396 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 250 | Newmark Stat Sherman Ave |  | EBL | 9 | 10 | 17 | 3 | 18 | 14 |  | 17 | 20 | 4 | 16 | 10 | 19 | 15 | 15 | 13 |  |
|  | 250 |  | EB | EBt | 116 | 112 | 110 | 118 | 100 | 84 | 92 | 107 | 117 | 106 | 103 | 88 | 94 | 106 | 96 | 107 |  |
|  | 250 | Count Date : 07/11/2017 |  | EBR | 38 | 44 | 25 | 35 | 37 | 32 | 29 | 33 | 42 | 26 | 32 | 28 | 37 | 28 | 39 | 24 |  |
|  | 250 | 2017 |  | WBL | 8 | 1 | 3 | 2 | 5 | 1 | 5 | 3 | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 4 |  |
|  | 250 |  | wB | WBT | 75 | 73 | 86 | 80 | 91 | 97 | 92 | ${ }_{9}$ | 78 | 69 | 80 | 95 | 87 | 93 | 94 | 66 |  |
|  | 250 |  |  | WBR | 7 | 2 | 8 | 5 | 3 | 3 | 5 |  | 3 | 4 | 7 | 6 | 9 | 3 | 6 | 4 |  |
|  | 250 | PM Peak Hour: 2:00 PM-3:00 PM |  | NBL | 39 | 34 | 40 | 40 | ${ }^{36}$ | ${ }^{23}$ | 40 | 35 | 40 | ${ }^{29}$ | 36 | 31 | 39 | 50 | ${ }^{23}$ | 28 |  |
|  | 250 | PM Peak Hour Used : 4:30 PM-5:30 PM | NB | NBT | ${ }^{23}$ | 17 | 21 | 22 | 18 | 21 | 29 | 20 | 20 | 26 | 31 | 17 | 36 | 34 | 19 | 22 |  |
|  | 250 | Volume Difference: 320 |  | NBR | 16 | 8 | 10 |  |  | 10 | 11 | 12 | 8 | 5 | 10 | 3 | 10 |  | 7 | 5 |  |
|  | 250 |  |  | SBL | 75 | 109 | 44 | 11 | 6 | 5 | 8 | 5 | 1 | 3 | 6 | 3 | 5 | 2 | 6 | 3 |  |
|  | 250 | PHF: | SB | SBT | 51 | 72 | 36 | 28 | 22 | 22 | 15 | 29 | 16 | 25 | 18 | 25 | 28 | 20 | ${ }^{33}$ | 18 |  |
|  | 250 | 0.93 |  | SBR | 25 | 18 | 32 | 17 | 11 | 28 | 15 | 12 | 12 | 13 | 11 | 15 | 23 | 29 | 19 | 10 |  |
|  | PHV | 1459 | 15 min SUM |  | 482 | 500 | 432 | 365 | 355 | 340 | 347 | 371 | 360 | 313 | 353 | 323 | 390 | 393 | 360 | 304 |  |
|  | Max 15 min | 393 | TEV |  |  |  |  | 1779 | 1652 | 1492 | 1407 | 1413 | 1418 | 1391 | 1397 | 1349 | 1379 | 1459 | 1466 | 1447 | 1779 |
| 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 260 | US 101 at Newmark St |  | EBL | 47 | ${ }^{37}$ | ${ }^{39}$ | ${ }^{36}$ | ${ }^{33}$ | ${ }^{43}$ | ${ }^{42}$ | ${ }^{42}$ | 42 | ${ }^{26}$ | 48 | 49 | ${ }^{38}$ | ${ }^{28}$ | ${ }^{36}$ | 29 |  |
|  | 260 |  | EB | EBt | 0 | 0 | , |  | 0 | 1 | 1 | 1 | 0 | , | 0 | 0 | 1 |  | 0 | 0 |  |
|  | 260 | Count Date : 04/22212016 |  | EBR | 73 | 67 | 67 | 78 | 83 | 74 | 100 | 99 | 84 | 76 | 63 | 75 | 83 | 79 | 69 | 67 |  |
|  | 260 | 2016 |  | WBL | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 |  |
|  | 260 |  | wB | WBt | 0 | 0 | 0 | 1 | 2 | 2 | 0 | - | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 |  |
|  | 260 |  |  | WBR | 2 | 0 | 0 | 2 | 0 | 1 | 2 | 2 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 |  |
|  | 260 | PM Peak Hour: 2:45 PM-3:45 PM |  | NBL | 67 | 66 | 98 | 101 | 70 | 66 | 66 | 55 | 66 | 58 | 69 | 79 | 73 | 77 | 67 | 72 |  |
|  | 260 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 176 | 178 | 161 | 181 | 164 | 149 | 148 | 141 | 176 | 158 | 182 | 155 | 163 | 176 | 153 | 91 |  |
|  | 260 | Volume Difference: 79 |  | NBR | 0 | 1 | 1 | 1 | 1 | 0 |  | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |  |
|  | 260 |  |  |  | 1 | 1 | 1 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  | 260 | PHF: | SB | SBT | 158 | 143 | 131 | 240 | 171 | 151 | 170 | 175 | 169 | 188 | 174 | 143 | 179 | 175 | 190 | 131 |  |
|  | 260 | 0.98 |  | SBR | 20 | 22 | 22 | 17 | 20 | 13 | 33 | 21 | 18 | 15 | 13 | 21 | 17 | 25 | 26 | 8 |  |
|  | PHV ${ }^{2}$ | 2194 | 15 min SUM |  | 544 | 516 | 521 | 660 | 545 | 502 | 566 | 540 | 558 | 527 | 549 | 527 | 558 | 560 | 543 | 399 |  |
|  | Max 15 min 5 | 560 | TEV |  |  |  |  | 2241 | 2242 | 2228 | 2273 | 2153 | 2166 | 2191 | 2174 | 2161 | 2161 | 2194 | 2188 | 2060 | 2273 |
| 27 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1010 | Morison St at Lakeshore Dr |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1010 |  | EB | EBt | 8 | 8 | 10 | 13 | 8 | 10 | 17 | 13 | 16 | 8 | 16 | 12 | 12 | 10 | 9 | 5 |  |
|  | 1010 | Count Date: 07/11/2017 |  | EBR | 2 | 0 | 1 | 0 | 0 | 1 | 2 |  | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |  |
|  | 1010 | 2017 |  | WBL | 10 | 10 | 9 | 12 | a | 7 | 11 | 15 | 6 | 11 | 10 | 7 | 10 | 11 | 11 | 4 |  |
|  | 1010 |  | wB | WBT | 14 | 15 | 14 | 7 | 14 | 26 | 12 | 17 | 10 | 18 | 13 | 12 | 12 | 15 | 12 | 9 |  |
|  | 1010 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 |  |
|  | 1010 | PM Peak Hour: 4:30 PM-5:30 PM |  | NBL | 0 | 0 | 4 | 3 | 1 | 2 | 2 | 2 | 0 | 0 | 2 | 0 | 1 | 0 |  | 5 |  |
|  | 1010 | PM Peak Hour Used : 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | - | , | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1010 | Volume Difference: 0 |  | NBR | 10 | 10 | 8 | 14 | 23 | 10 | 14 | 13 | 9 | 14 | 16 | 24 | 24 | 29 | 9 | 15 |  |
|  | 1010 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1010 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1010 | 0.90 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV | 237 | 15 min SUM |  | 44 | 43 | 46 | 49 | 52 | 56 | 58 | 63 | 41 | 51 | 57 | 55 | 59 | 66 | 43 | 38 |  |
|  | Max 15 min | 66 | TEV |  |  |  |  | 182 | 190 | 203 | 215 | 229 | 218 | 213 | 212 | 204 | 222 | 237 | 223 | 206 | 237 |
| ${ }^{28}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1020 | Newmark Ave at Cape Arago Highway Empire Blvd |  | EBL | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |  |
|  | 1020 |  | EB | EBT | 5 | 6 | 2 | 4 | 4 | 8 | 5 | 6 | 3 | 4 | 2 | 0 | 2 | 0 | 1 | 2 |  |
|  | 1020 | Count Date : $07 / 1112017$ |  | EBR | 0 | 1 | 1 | 1 | 1 | 0 |  | 1 | 1 | 1 |  |  | 0 | 0 | 0 | 0 |  |
|  | 1020 | 2017 |  | WBL | ${ }^{93}$ | 101 | 110 | 89 | 112 | ${ }^{97}$ | 85 | 94 | 72 | 146 | ${ }^{93}$ | 106 | 108 | ${ }^{72}$ | 144 | 78 |  |
|  | 1020 |  | wB | WBt | 4 | 3 | 6 | 6 | 5 | 6 | 3 |  | 2 | 1 | 1 | 5 | 3 | 1 | 2 | 4 |  |
|  | 1020 |  |  | WBR | 0 | 2 | 3 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |  | 1 | 0 | 1 | 1 | 0 |  |
|  | 1020 | PM Peak Hour: 4:30 PM-5:30 PM |  | NBL | 0 | 1 | 0 | ${ }^{3}$ | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 |  |
|  | 1020 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT |  | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 |  | 0 | 0 | 1 | 0 | 0 |  |
|  | 1020 | Volume Difference: 0 |  | NBR | 80 | 97 | 79 | 60 | 85 | 68 | 122 | 80 | 76 | 25 | 154 | 61 | 71 | 124 | 94 | 98 |  |
|  | 1020 |  |  | SBL | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 |  |
|  | 1020 | PHF: | SB | SBT | 3 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |  |
|  | 280 | 0.80 |  | SBR | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |


| E-W ID | Synchro ID | Intersection | Updated: |  |  | $10 / 24 / 2018$ |  | 2:45 PM | 3:00 PM | 3:15 PM | 3:30 PM | 3:45 PM | 4:00 PM | 4:15 PM | 4:30 PM | 4:45 PM | 5:00 PM | 5:15 PM | 5:30 PM | 5:45 PM | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Direction | Movement | 2:00 PM | 2:15 PM | 2:30 PM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | PHV | 817 | 15 min SUM |  | 185 | 212 | 205 | 165 | 210 | 184 | 220 | 188 | 159 | 180 | 255 | 174 | 185 | 203 | 242 | 184 |  |
|  | Max 15 min | 255 | TEV |  |  |  |  | 767 | 792 | 764 | 779 | 802 | 751 | 747 | 782 | 768 | 794 | 817 | 804 | 814 | 817 |
| 29 | 1030 | Newmark Ave at Morison St |  | EBL | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |  |
|  | 1030 |  | EB | EBT | 147 | 157 | 126 | 155 | 154 | 151 | 140 | 139 | 132 | 126 | 132 | 141 | 131 | 122 | 120 | 116 |  |
|  | 1030 | Count Date : 05/10/2016 |  | EBR | 9 | 7 | 7 | 5 | 6 | 7 | 7 | 4 | 5 | 5 | 7 | 8 | 6 | 6 | 7 | 4 |  |
|  | 1030 | 2016 |  | WBL | 29 | 30 | 30 | 25 | 30 | 34 | 33 | 28 | 33 | 42 | 42 | 25 | 28 | 45 | 42 | 38 |  |
|  | 1030 |  | wB | WbT | 148 | 120 | 143 | 165 | 169 | 146 | 164 | 169 | 141 | 128 | 174 | 135 | 157 | 170 | 159 | 158 |  |
|  | 1030 |  |  | WBR | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 1 | 0 | 1 | 1 |  |
|  | 1030 | PM Peak Hour: 2:45 PM-3:45 PM |  | NBL | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 4 | 3 | 1 | 1 | 2 | 1 |  |
|  | 1030 | PM Peak Hour Used: : 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1030 | Volume Difference: 79 |  | NBR | 38 | 27 | 31 | 71 | 34 | 25 | 29 | 23 | 38 | 32 | 26 | 30 | 32 | 42 | 35 | 36 |  |
|  | 1030 |  |  | SBL | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |  |
|  | 1030 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1030 | 0.95 |  | SBR | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |  |
|  | PHV | 1479 | 15 min SUM |  | 373 | 348 | 338 | 424 | 395 | 366 | 373 | 366 | 353 | 336 | 391 | 343 | 358 | 387 | 366 | 355 |  |
|  | Max 15 min | 391 | TEV |  |  |  |  | 1483 | 1505 | 1523 | 1558 | 1500 | 1458 | 1428 | 1446 | 1423 | 1428 | 1479 | 1454 | 1466 | 1558 |
| 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1040 | Newmark Ave at Ocean Blvd |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1040 |  | Eb | EBT | 116 | 132 | 110 | 122 | 127 | 115 | 129 | 125 | 124 | 81 | 135 | 118 | 88 | 131 | 129 | 127 |  |
|  | 1040 | Count Date : $07 / 11 / 2017$ |  | EBR | 77 | 65 | 73 | 55 | 64 | 59 | 68 | 68 | 66 | 58 | 64 | 57 | 58 | 61 | 73 | 56 |  |
|  | 1040 | 2017 |  | WBL | 1 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 1 | 0 | 0 | 0 |  |
|  | 1040 |  | wB | wbt | 120 | 123 | 138 | 137 | 143 | 130 | 137 | 130 | 122 | 161 | 137 | 135 | 155 | 152 | 147 | 127 |  |
|  | 1040 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1040 | PM Peak Hour: 4:45 PM-5:45 PM |  | NBL | 66 | 70 | 83 | 56 | 84 | 81 | ${ }^{67}$ | 69 | 68 | 59 | 90 | 76 | 96 | 103 | 82 | 54 |  |
|  | 1040 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 0 |  | 0 |  | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1040 | Volume Difference: 6 |  | NBR | 25 | 24 | 15 | 14 | 13 | 16 | 11 | 16 | 20 | 14 | 15 | 11 | 13 | 9 | 16 | 11 |  |
|  | 1040 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1040 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1040 | 0.93 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV | 1705 | 15 min SUM |  | 405 | 414 | 419 | 384 | 431 | 401 | 412 | 408 | 400 | 373 | 441 | 397 | 411 | 456 | 447 | 375 |  |
|  | Max 15 min | 456 | TEV |  |  |  |  | 1622 | 1648 | 1635 | 1628 | 1652 | 1621 | 1593 | 1622 | 1611 | 1622 | 1705 | 1711 | 1689 | 1711 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 31 | 1050 | Newmark Ave at Laclair St |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1050 |  | EB | Ebt | 165 | 177 | 164 | 151 | 152 | 150 | 142 | 152 | 170 | 124 | 148 | 165 | 125 | 163 | 163 | 160 |  |
|  | 1050 | Count Date : $07 / 11 / 2017$ |  | EBR | 2 | 6 | 6 | 3 | 8 | 4 | 5 | 9 | 5 | 2 | 7 | 3 | 1 | 6 | 6 | 3 |  |
|  | 1050 | 2017 |  | WBL | 20 | 18 | 18 | 16 | 15 | 16 | 16 | 10 | 8 | 10 | 15 | 16 | 13 | 12 | 10 | 12 |  |
|  | 1050 |  | WB | WBT | 152 | 142 | 164 | 160 | 145 | 164 | 155 | 161 | 149 | 189 | 161 | 155 | 177 | 184 | 158 | 146 |  |
|  | 1050 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1050 | PM Peak Hour: 4:45 PM-5:45 PM |  | NBL | 6 | 4 | 8 | 8 | 8 | 6 | 6 | 4 | 3 | 2 | 6 | 1 | 14 | 2 | 12 | 7 |  |
|  | 1050 | PM Peak Hour Used : 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1050 | Volume Difference: 24 |  | NBR | 28 | 23 | 23 | 29 | 28 | 24 | 25 | 21 | 36 | 22 | 20 | 31 | 45 | 23 | 32 | 28 |  |
|  | 1050 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1050 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1050 | 0.96 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV 1 | 1493 | 15 min SUM |  | 373 | 370 | 383 | 367 | 356 | 364 | 349 | 357 | 371 | 349 | 357 | 371 | 375 | 390 | 381 | 356 |  |
|  | Max 15 min | 390 | TEV |  |  |  |  | 1493 | 1476 | 1470 | 1436 | 1426 | 1441 | 1426 | 1434 | 1448 | 1452 | 1493 | 1517 | 1502 | 1517 |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1060 | Empire Blvd at Pacific Ave |  | EBL | 0 | , | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1060 |  | EB | EBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1060 | Count Date : $07 / 11 / 2017$ |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1060 | 2017 |  | WBL | 8 | 11 | 6 | 8 | 7 | 6 | 3 | 5 | 8 | 13 | 8 | 12 | 6 | 9 | 21 | 9 |  |
|  | 1060 |  | wB | WBT | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1060 |  |  | WBR | 0 | 0 | 0 | 0 | 1 | 0 |  | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 |  |
|  | 1060 | PM Peak Hour: 4:45 PM-5:45 PM |  | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1060 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 77 | 101 | 80 | 75 | 75 | 72 | 118 | 89 | 71 | 34 | 152 | 59 | 70 | 136 | 87 | 96 |  |
|  | 1060 V | Volume Difference: 62 |  | NBR | 6 | 6 | 7 | 3 | 4 | 7 | 10 | 8 | 12 | 5 | 15 | 2 | 7 | 15 | 4 | 3 |  |
|  | 1060 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 2 | 0 |  |
|  | 1060 P | PHF: | SB | SBT | 87 | 105 | 107 | 119 | 134 | 78 | 68 | 95 | 65 | 176 | 56 | 155 | 103 | 56 | 177 | 79 |  |
|  | 1060 | 0.94 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV 8 | 866 | 15 min SUM |  | 178 | 223 | 200 | 205 | 221 | 163 | 200 | 198 | 157 | 228 | 231 | 231 | 188 | 216 | 293 | 187 |  |
|  | Max 15 min | 231 | TEV |  |  |  |  | 806 | 849 | 789 | 789 | 782 | 718 | 783 | 814 | 847 | 878 | 866 | 928 | 884 | 928 |
| 33 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1070 | Thompson Rd at Woodland Dr |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1070 |  | Eb | EBT | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1070 | Count Date : 07/11/2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1070 | 2017 |  | WBL | ${ }^{12}$ | 8 | 8 | 9 | 5 | 11 | ${ }^{12}$ | 3 | 3 | 7 | 11 | 11 | 6 | 11 | 7 | 8 |  |
|  | 1070 |  | wB | WBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1070 |  |  | WBR | 49 | 43 | 46 | 39 | 49 | 51 | 48 | 42 | 43 | 38 | 48 | 54 | 45 | 39 | 24 | 27 |  |
|  | 1070 P | PM Peak Hour: 2:00 PM-3:00 PM |  | NBL | 0 |  | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 |  |
|  | 1070 P | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 73 | 77 | 80 | 70 | 72 | 60 | 84 | 60 | 80 | 70 | 78 | 78 | 72 | 70 | 49 | 52 |  |
|  | 1070 | Volume Difference: 72 |  | NBR | 6 | 17 | 5 | 9 | 6 | 6 |  | 6 | 4 | 6 | 8 | 12 | 4 | 2 |  | 4 |  |
|  | 1070 |  |  | SBL | 31 | 38 | 35 | 46 | 28 | 30 | ${ }^{24}$ | 31 | 32 | 32 | 31 | 25 | ${ }^{38}$ | ${ }^{26}$ | 24 | ${ }^{33}$ |  |
|  | 1070 P | PHF: | SB | SBT | 91 | 124 | 80 | 88 | 100 | 86 | 85 | 92 | 100 | ${ }^{93}$ | 77 | 84 | 103 | 79 | 77 | 67 |  |
|  | 1070 | 0.94 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV 1 | 1012 | 15 min SUM |  | 262 | 307 | 254 | 261 | 260 | 244 | 262 | 234 | 262 | 246 | 253 | 264 | 268 | 227 | 189 | 191 |  |
|  | Max 15 min 2 | 268 | TEV |  |  |  |  | 1084 | 1082 | 1019 | 1027 | 1000 | 1002 | 1004 | 995 | 1025 | 1031 | 1012 | 948 | 875 | 1084 |
|  |  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 34 | 1080 | Koosbay Blvd at Thompson Rd |  | EBL | 16 | 9 | 20 | 11 | 12 | 14 | ${ }^{13}$ | 18 | 17 | 7 | ${ }^{23}$ | 9 | ${ }^{27}$ | 16 | 12 | 10 |  |
|  | 1080 |  | EB | EBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1080 | Count Date : $07 / 11 / 2017$ |  | EBR | 34 | 27 | 44 | 36 | 43 | 41 | 47 | 38 | 42 | 36 | 60 | 38 | 54 | 43 | 44 | 38 |  |
|  | 1080 |  |  | WBL | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1080 |  | wB | wbt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1080 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

## E-WID Synchroid

Updated: 10/24/2018


Updated: 10/2412018

| -WI | Synchro ID | tersection | Direction | Movemen | 2:00 PN | : 15 PN | 2:30 PN | 2:45 PN | 3:00 PN | 3:15 PN | 3:30 PN | 3:45 PN | 4:00 PII | :15 P | 4:30 PM | 4:45 P | 5:00 P | 5:15 P | 30 | 5:45 PM | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 40 | 1140 | Commercial Ave at US 101 South | EB | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 |  |  | EBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 | Count Date : 07/11/2017 <br> 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 |  | wB | WBL | 6 | 5 | 9 | 7 | 5 | 3 | 6 | 8 | 6 | 7 | 8 | 4 | 10 | 12 | 8 | 3 |  |
|  | 1140 |  |  | wBt | 76 | 80 | 84 | 80 | 75 | 84 | 63 | 72 | 64 | 87 | 74 | 77 | 73 | 67 | 65 | 67 |  |
|  | 1140 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 | PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: : 4:30 PM-5:30 PM Volume Difference: 0 | NB | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 |  | SB | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1140 | PHF: |  | SBT | 258 | 240 | 264 | 268 | 269 | 256 | 268 | 296 | 286 | 259 | 280 | 303 | 311 | 317 | 280 | 236 |  |
|  | 1140 | 0.95 |  | SBR | 24 | 23 | 23 | 28 | 27 | 38 | 24 | 34 | 19 | 26 | 17 | 21 | 19 | 30 | 19 | 17 |  |
|  | PHVMax 15 min | 1623 | 15 min SUM |  | 364 | 348 | 380 | 383 | 376 | 381 | 361 | 410 | 375 | 379 | 379 | 405 | 413 | 426 | 372 | 323 |  |
|  |  | 426 | TEV |  |  |  |  | 1475 | 1487 | 1520 | 1501 | 1528 | 1527 | 1525 | 1543 | 1538 | 1576 | 1623 | 1616 | 1534 | 1623 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 41 | 1150 | Commercial Ave at US 101 North |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 |  | EB | EBt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 | Count Date : 07/12/2017 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 |  |  | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 |  | wB | wbt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 | PM Peak Hour: 2:15 PM-3:15 PM PM Peak Hour Used: : 4:30 PM-5:30 PM Volume Difference: 107 | NB | NBL | 77 | 76 | 78 | 69 | 80 | 67 | 72 | 65 | 83 | 84 | 71 | 62 | 64 | 79 | 58 | 66 |  |
|  | 1150 |  |  | NBT | 239 | 302 | 315 | 274 | 298 | 256 | 272 | 278 | 265 | 273 | 288 | 259 | 299 | 263 | 256 | 208 |  |
|  | 1150 |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 |  | SB | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 | PHF: |  | SBt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1150 | 0.95 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | PHV | 1385 | 15 min SUM |  | 316 | 378 | 393 | 343 | 378 | 323 | 344 | 343 | 348 | 357 | 359 | 321 | 363 | 342 | 314 | 274 |  |
|  | Max 15 min | 363 | TEV |  |  |  |  | 1430 | 1492 | 1437 | 1388 | 1388 | 1358 | 1392 | 1407 | 1385 | 1400 | 1385 | 1340 | 1293 | 1492 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 42 | 1160 | 10th St at Central Ave | EB | EBL | 2 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 7 | 0 | 3 | 4 | 4 | 4 | 2 | 1 |  |
|  | 1160 |  |  | EBT | 127 | 137 | 138 | 117 | 135 | 126 | 129 | 113 | 130 | 124 | 110 | 129 | 132 | 144 | 122 | 95 |  |
|  | 1160 | Count Date : 07/11/2017 2017 |  | EBR | 21 | 27 | 27 | 27 | 23 | 18 | 24 | 28 | 24 | 20 | 22 | 33 | 30 | 29 | 26 | 24 |  |
|  | 1160 |  | wB | WBL | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 1 | 0 | 0 |  | 2 | 3 | 1 | 0 | 0 |  |
|  | 1160 |  |  | Wbt | 98 | 112 | 105 | 108 | 98 | 102 | 107 | 85 | 88 | 111 | 105 | 96 | 109 | 101 | 91 | 77 |  |
|  | 1160 |  |  | WBR | 4 | 6 | 7 | 5 | 4 | 7 | 4 | 0 | 4 | 3 | 1 | 4 | 6 | 5 | 2 | 4 |  |
|  | 1160 | PM Peak Hour 4:45 PM-5:45 PM PM Peak Hour Used: : :30 PM-5:30 PM Volume Difference: 1 | NB | NBL | 30 | 38 | 34 | ${ }^{28}$ | 56 | 38 | ${ }^{41}$ | ${ }^{31}$ | 25 | ${ }^{43}$ | 39 | 41 | 43 | 42 | 32 | 29 |  |
|  | 1160 |  |  | NBT | 24 | 14 | 20 | 16 | 30 | 20 | 20 | 25 | 11 | 25 | 20 | 23 | 31 | 20 | 24 | 28 |  |
|  | 1160 |  |  | NBR | 5 | 1 | 1 | 3 | 1 | 2 | 3 |  | 1 | 1 | 5 | 5 | 2 | 4 | 1 | 0 |  |
|  | 1160 |  | SB | SBL | 37 | 33 | 49 | 34 | 42 | ${ }^{36}$ | 28 | 35 | ${ }^{33}$ | 30 | 32 | 33 | ${ }^{33}$ | 34 | 36 | 24 |  |
|  | 1160 | PHF: |  | SBT | 23 | 20 | 21 | 13 | 17 | 16 | 12 | 15 | 18 | 17 | 18 | 20 | 20 | 16 | 16 | 20 |  |
|  | 1160 | 0.94 |  | SBR | 8 | 4 | 6 | 4 | 2 | 6 | 5 | 5 | 8 | 6 | 1 | 4 | 6 | 7 | 5 | 7 |  |
|  | $\begin{array}{\|c\|} \hline \text { PHV } \\ \text { Max } 15 \text { min } \\ \hline \end{array}$ | 1576 | 15 min SUM |  | 379 | 392 | 410 | 357 | 412 | 373 | 375 | 342 | 349 | 380 | 356 | 394 | 419 | 407 | 357 | 309 |  |
|  |  | 419 | TEV |  |  |  |  | 1538 | 1571 | 1552 | 1517 | 1502 | 1439 | 1446 | 1427 | 1479 | 1549 | 1576 | 1577 | 1492 | 1577 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 43 | 1170 | Central Ave at 7th St | EB | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1170 |  |  | EBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1170 | Count Date : 07/12/2017 2017 |  | EBR | 151 | 143 | 148 | 154 | 132 | 138 | 165 | 161 | 155 | 142 | 177 | 130 | 159 | 145 | 141 | 130 |  |
|  | 1170 |  | wB | WBL | 7 | 3 | 0 | 3 | 5 | 3 | 3 |  | 4 | 3 | 2 | 1 | 4 | 3 | 0 | 1 |  |
|  | 1170 |  |  | wBt | 11 | 5 | 0 | 2 | 11 | 4 | 5 | 12 | 7 | 9 | 6 | 7 | 7 | 9 | 9 | 3 |  |
|  | 1170 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1170 | PM Peak Hour 3:45 PM-4:45 PM PM Peak Hour Used: :3:30 PM-5:30 PM Volume Difference: 63 | NB | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1170 |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1170 |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1170 |  | SB | SBL | 0 | 3 | 3 | 0 | 2 | 0 | 1 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |  |
|  | 1170 | PHF: |  | SBT | 31 | 27 | 18 | 17 | 25 | 9 | 24 | ${ }^{27}$ | 23 | 15 | 18 | 15 | 19 | 15 | 15 | 10 |  |
|  | 1170 | 0.91 |  | SBR | 117 | 102 | 125 | 97 | 97 | 98 | 95 | 98 | 108 | 117 | 98 | 97 | 121 | 92 | 84 | 92 |  |
|  | PHVMax 15 min | 1125 | 15 min SUM |  | 317 | 283 | 294 | 273 | 272 | 252 | 293 | 302 | 297 | 288 | 301 | 250 | 310 | 264 | 249 | 238 |  |
|  |  | 310 | TEV |  |  |  |  | 1167 | 1122 | 1091 | 1090 | 1119 | 1144 | 1180 | 1188 | 1136 | 1149 | 1125 | 1073 | 1061 | 1188 |
| ${ }^{44}$ |  | 7 th Stat Anderson Ave |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1180 |  | EB | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1180 |  |  | EBt | 14 | 11 | 10 | 15 | 10 | 9 | 14 | 10 | 13 | 11 | 12 | 14 | 12 | 10 |  | 14 |  |
|  | 1180 | 2017 |  | EBR | 7 | 6 | 5 | 4 | 5 | 7 | 5 |  | 4 | 10 | 8 |  | 8 | 5 | 8 | 5 |  |
|  | 1180 |  | wB | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1180 |  |  | WBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1180 |  |  | WBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1180 | PM Peak Hour: 3:30 PM-4:30 PM PM Peak Hour Used : 4:30 PM-5:30 PM Volume Difference: 56 | NB | NBL | ${ }^{28}$ | 30 | ${ }^{27}$ | 22 | 29 | ${ }^{23}$ | ${ }^{33}$ | 25 | ${ }^{23}$ | ${ }^{32}$ | 18 | 20 | ${ }^{24}$ | 17 | 16 | 16 |  |
|  | 1180 |  |  | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1180 |  |  | NBR | 8 | 8 | 4 | 3 | 4 | 7 | 5 | 3 | 4 | 2 | 4 | 4 | 4 | 4 | 6 | 5 |  |
|  | 1180 |  | SB | SBL | 165 | 161 | 140 | 153 | 137 | 134 | 167 | 169 | 160 | 145 | 177 | 127 | 153 | 137 | 141 | 127 |  |
|  | 1180 | PHF: |  | SBT | 25 | 22 | 27 | 28 | 30 | 27 | 31 | 24 | 26 | 20 | 26 | 22 | 33 | 31 | 25 | 18 |  |
|  | 1180 | 0.90 |  | SBR | 5 | 5 | 4 | 3 | 6 | 4 | 4 | 6 | 2 | 3 | 5 | 6 | 7 | 6 | 0 | 5 |  |
|  | PHV | 901 | 15 min SUM |  | 252 | 243 | 217 | 228 | 221 | 211 | 259 | 243 | 232 | 223 | 250 | 200 | 241 | 210 | 205 | 190 |  |
|  | Max 15 min | 250 | TEV |  |  |  |  | 940 | 909 | 877 | 919 | 934 | 945 | 957 | 948 | 905 | 914 | 901 | 856 | 846 | 957 |
| 45 |  | Elrod Ave at 10th St <br> Count Date : 07/12/2017 2017 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1190 |  | EB | EBL | 16 | 18 | 15 | ${ }^{21}$ | 19 | 10 | 20 | 18 | 19 | 12 | 15 | 18 | 18 | ${ }^{13}$ | 16 | 19 |  |
|  | 1190 |  |  | EBT | 0 | 3 | 5 | 2 | 2 | 4 | 4 |  | 1 |  | 2 | 1 | 3 | 3 | 5 | 3 |  |
|  | 1190 |  |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |  | 0 | 0 | 0 |  |
|  | 1190 |  | wB | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1190 |  |  | WBT | 1 | 3 | 0 | 3 | 3 | 4 | 0 | 2 | 2 | 1 | 5 | 8 | 6 | 3 | 4 | 7 |  |
|  | 1190 |  |  | WBR | 25 | 22 | 17 | 31 | 23 | 25 | 23 | 20 | 24 | 19 | 20 | 28 | 32 | 38 | 21 | 25 |  |
|  | 1190 | PM Peak Hour: 4:45 PM-5:45 PM PM Peak Hour Used: : 4:30 PM-5:30 PM Volume Difference: 19 |  | NBL | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 |  |
|  | 1190 |  | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1190 |  |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

## Intersection

Direction Updated: 10/24/2018


|  |  |  |  |  | Updated: | $10124 / 2018$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E-W ID | Synchro ID | Intersection | Direction | Movement | 2:00 PM | 2:15 PM | 2:30 PM | 2:45 PM | 3:00 PM | 3:15 PM | 3:30 PM | 3:45 PM | 4:00 PM | 4:15 PM | 4:30 PM | 4:45 PM | 5:00 PM | 5:15 PM | 5:30 PM | 5:45 PM | Max |
| 51 | 12501250 | Johnson Ave at US 101 North | EB | EBL | ${ }^{27}$ | 27 | 26 | 30 | 25 | 24 | 29 | ${ }^{22}$ | ${ }^{23}$ | 24 | 20 | ${ }^{23}$ | 29 | 20 | 22 | 16 |  |
|  |  |  |  | EBT | 79 | 86 | 73 | 75 | 95 | 77 | 83 | 82 | 78 | 74 | 70 | 83 | 89 | 89 | 78 | 65 |  |
|  | $\begin{aligned} & 1250 \\ & 1250 \end{aligned}$ | Count Date : 07/11/2017 2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  |  |  | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |  |
|  | 1250 |  | wB | WBt | 52 | 54 | 61 | 56 | 54 | ${ }^{63}$ | 53 | 62 | 77 | 64 | 53 | 63 | 65 | 71 | 72 | 84 |  |
|  | $\begin{aligned} & 1250 \\ & 1250 \end{aligned}$ |  |  | WBR | 51 | 63 | 52 | 36 | 49 | 52 | 53 | 57 | 35 | 63 | 45 | 47 | 45 | 47 | 56 | 50 |  |
|  |  | PM Peak Hour: 3:30 PM-4:30 PM |  | NBL | 5 | 3 | 2 | 7 | 9 | 5 | 10 | 8 | 7 | 4 | 13 | 8 | 5 | 6 | 6 | 7 |  |
|  | 1250 | PM Peak Hour Used : 4:30 PM-5:30 PM | NB | NBT | 215 | 221 | 226 | 246 | 233 | 237 | 253 | 230 | 251 | 250 | 246 | 242 | 243 | 221 | 187 | 214 |  |
|  | 1250 | Volume Difference: 23 |  | NBR | 36 | 24 | 33 | 27 | 25 | 35 | 27 | 32 | 24 | 29 | 30 | 34 | 29 | 45 | 28 | 25 |  |
|  | 1250 |  |  | SBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | $\begin{aligned} & 1250 \\ & 1250 \\ & 1 \end{aligned}$ | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  | 0.98 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | $\begin{gathered} \text { PHV } \\ \text { Max } 15 \text { min } \end{gathered}$ | 1981 | 15 min SUM |  | 465 | 478 | 473 | 477 | 490 | 493 | 508 | 493 | 495 | 508 | 477 | 500 | 505 | 499 | 449 | 461 |  |
|  |  | 505 | TEV |  |  |  |  | 1893 | 1918 | 1933 | 1968 | 1984 | 1989 | 2004 | 1973 | 1980 | 1990 | 1981 | 1953 | 1914 | 2004 |
| 52 |  | 7th St at Lockhart Ave/Southwest Bivd |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1260 |  |  | EBL | 3 | 8 | 7 | 11 | 5 | 11 | 7 | 9 | 7 | 3 | 4 | 8 | 9 |  | 9 | 12 |  |
|  |  |  | EB | EBT | 35 | 40 | 46 | 46 | 47 | 41 | 52 | 59 | 50 | 57 | 48 | 56 | 61 | 46 | 47 | 62 |  |
|  | $\begin{aligned} & 1260 \\ & 1260 \end{aligned}$ | Count Date : 07/12/2017 |  | EBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  | 2017 |  | WBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  |  | wB | wbt | 46 | 49 | 49 | 53 | 58 | 59 | 79 | 57 | 64 | 58 | 66 | 63 | 88 | 84 | 64 | 60 |  |
|  | $\begin{aligned} & 1260 \\ & 1260 \end{aligned}$ |  |  | WBR | 3 | 1 | 0 | 6 | 2 | 3 | 4 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 2 |  |
|  | $\begin{aligned} & 1260 \\ & 1260 \end{aligned}$ | PM Peak Hour: 4:45 PM-5:45 PM |  | NBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 12601260 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  | Volume Difference: 9 |  | NBR | 0 | 0 | 0 | , | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | $\begin{aligned} & 1260 \\ & 1260 \end{aligned}$ |  |  | SBL | 1 | 2 | 2 | 3 | 5 | 1 | 2 | 2 | 2 | 0 | 3 | 3 | 0 | 0 | 2 | 3 |  |
|  | 12601260 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  | 0.87 |  | SBR | 9 | 8 | 8 | 11 | 13 | 10 | 3 | 10 | 8 | 8 | 7 | 15 | 13 | 15 | 15 | 7 |  |
|  | $\begin{array}{\|c\|} \hline \text { PHV } \\ \text { Max } 15 \text { min } \end{array}$ | 599 | 15 min SUM |  | 97 | 108 | 112 | 130 | 130 | 125 | 147 | 138 | 132 | 130 | 129 | 146 | 173 | 151 | 138 | 146 |  |
|  |  | 173 | TEV |  |  |  |  | 447 | 480 | 497 | 532 | 540 | 542 | 547 | 529 | 537 | 578 | 599 | 608 | 608 | 608 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 53 | 1270 | 6th Ave at D St/ Coos River lighway |  | EBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 12701270 |  | EB | EBT | 3 | 4 | 4 | 2 | 0 | 4 | 3 | 3 | 4 | 1 | 5 | 3 | 5 | 5 | 0 | 1 |  |
|  |  | Count Date : 07/12/2017 |  | EBR | 12 | 12 | 5 | 15 | 9 | 11 | 10 | 12 | 12 | 10 | 6 | 14 | 15 | 12 | 14 | 19 |  |
|  | 1270 | 2017 |  | WBL | 40 | 54 | 33 | 35 | 46 | 39 | 42 | 40 | 34 | 57 | 76 | 34 | 26 | 46 | 34 | 34 |  |
|  | 1270 |  | WB | WBT | 3 | 2 |  | 4 | 6 | 1 | 0 | 5 | 5 | 2 | 4 |  | 4 | 5 | 2 | 4 |  |
|  | $\begin{aligned} & 1270 \\ & 1270 \end{aligned}$ |  |  | WBR | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  | PM Peak Hour: 4:30 PM-5:30 PM |  | NBL | 14 | 9 | 13 | 14 | 12 | 10 | 19 | 18 | 9 | 15 | 12 | 24 | 14 | 20 | 21 | ${ }^{21}$ |  |
|  | 1270 | PM Peak Hour Used : 4:30 PM-5:30 PM | NB | NBT | 0 | 2 | 0 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 0 |  |
|  | $\begin{aligned} & 1270 \\ & 1270 \end{aligned}$ | Volume Difference: 0 |  | NBR | 67 | 29 | 52 | 44 | 39 | 45 | 47 | 47 | 55 | 65 | 52 | 61 | 71 | 71 | 59 | 59 |  |
|  |  |  |  | SBL | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1270 | PHF: | SB | SBT | 2 | 1 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 |  |
|  | 1270 | 0.93 |  | SBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | $\begin{array}{\|c\|} \hline \text { PHV } \\ \text { Max } 15 \text { min } \\ \hline \end{array}$ | 593 | 15 min SUM |  | 141 | 115 | 110 | 115 | 115 | 114 | 124 | 127 | 122 | 151 | 155 | 142 | 136 | 160 | 132 | 139 |  |
|  |  | 160 | TEV |  |  |  |  | 481 | 455 | 454 | 468 | 480 | 487 | 524 | 555 | 570 | 584 | 593 | 570 | 567 | 593 |
| 54 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Coos River Rd at Ross Inlet Rd | EB | EBL EBT | 5 38 | 3 33 | 3 <br> 27 | 8 <br> 33 | 5 33 | 4 39 | 3 29 0 | 5 38 | 4 <br> 38 | 11 40 | 11 33 | 9 47 | 6 51 | 7 55 | 9 42 | 5 55 |  |
|  | $\begin{aligned} & 1280 \\ & 1280 \\ & 1 \end{aligned}$ | Count Date : 07/12/2017 |  | EBR |  | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 |  |
|  | 1280 | 2017 |  | WBL | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | $1280$ |  | wB | wBT | 38 | 40 | 32 | ${ }^{23}$ | 42 | 31 | 29 | 32 | 27 | 41 | 21 | 20 | 20 | 37 | 22 | 24 |  |
|  |  |  |  | WBR | 1 | 1 | 0 | 3 | 2 | 0 | 1 | 0 |  | 4 | 1 | 2 | 1 | 0 | 1 | 0 |  |
|  | $\begin{aligned} & 1280 \\ & 1280 \\ & 120 \end{aligned}$ | PM Peak Hour: 4:15 PM-5:15 PM |  | NBL | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1280 1280 | PM Peak Hour Used: 4:30 PM-5:30 PM | NB | NBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | $\begin{aligned} & 1280 \\ & 1280 \end{aligned}$ | Volume Difference: 2 |  | NBR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |  |  |  | SBL | 1 | 1 | 1 | 0 | 1 |  | 2 | 1 |  | 2 | 2 | 0 | 0 | 2 | 2 | 1 |  |
|  | 1280 | PHF: | SB | SBT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  | 1280 | 0.84 |  | SBR | 2 | 4 | 4 | 4 | 6 | , | 5 | 6 | 6 | 9 | 50 | 9 | 8 | 4 | 3 | 1 |  |
|  | $\begin{gathered} \hline \text { PHV } \\ \text { Max } 15 \text { min } \\ \hline \end{gathered}$ |  | 15 min SUM |  | 85 | 82 | 67 | 71 | 89 | 80 | 69 | 82 | 76 | 107 | 118 | 87 | 86 | 105 | 79 | 86 |  |
|  |  |  | TEV |  |  |  |  | 305 | 309 | 307 | 309 | 320 | 307 | 334 | 383 | 388 | 398 | 396 | 357 | 356 | 398 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  |  |  |  | Bicycles |  |  |  |  |  |  |  |  |  | Pedestrians |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ID Intersection |  |  | Traffic Count Length | Peak Hour (4:30-5:30 PM) |  |  |  |  | Total Traffic Count Volume (4hr or 16 hr ) |  |  |  |  | Peak Hour (4:30-5:30 PM) |  |  |  |  | Total Traffic Count Volume (4hr or 16 hr ) |  |  |  |  |
|  |  |  | North | South | East | West | Total | North | South | East | West | Total | North | South | East | West | Total | North | South | East | West | Total |
|  | 1 | Arthur Street at Colorado Loop |  | 4 hr | 0 | 1 | 2 | 1 | 4 | 0 | 1 | 6 | 6 | 13 | 0 | 2 | 0 | 2 | 4 | 0 | 15 | 7 | 2 | 24 |
|  | 2 | Oak Street/W Airport Way at Colorado Avenue/Maple Leaf | 4 hr | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 4 | 9 | 3 | 3 | 0 | 0 | 6 | 3 | 9 | 0 | 1 | 13 |
|  | 3 | Maple Leaf at E Airport Way | 4 hr | 0 | 0 | 1 | 4 | 5 | 1 | 0 | 6 | 16 | 23 | 2 | 0 | 0 | 0 | 2 | 3 | 0 | 2 | 1 | 6 |
|  | 4 | US 101 at Florida Avenue | 4 hr | 2 | 0 | 0 | 0 | 2 | 16 | 0 | 0 | 3 | 19 | 8 | 0 | 2 | 2 | 12 | 20 | 6 | 13 | 13 | 52 |
|  | 5 | Virginia Avenue at Arthur Street | 4 hr | 0 | 0 | 3 | 1 | 4 | 0 | 0 | 5 | 1 | 6 | 1 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 6 |
|  | 6 | Virginia Avenue at Oak Street | 4 hr | 0 | 2 | 1 | 0 | 3 | 0 | 2 | 3 | 1 | 6 | 2 | 0 | 2 | 0 | 4 | 11 | 18 | 5 | 6 | 40 |
|  | 7 | Virginia Avenue at Maple Street | 4 hr | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 1 | 4 | 6 | 0 | 0 | 1 | 7 | 25 | 0 | 0 | 5 | 30 |
|  | 8 | Virginia Avenue at Broadway Street | 16 hr | 0 | 0 | 2 | 1 | 3 | 1 | 1 | 16 | 18 | 36 | 7 | 8 | 0 | 5 | 20 | 128 | 125 | 2 | 90 | 345 |
|  | 9 | Virginia Avenue at Pony Village Main Driveway | 4 hr | 0 | 0 | 2 | 2 | 4 | 0 | 0 | 3 | 6 | 9 | 0 | 11 | 0 | 0 | 11 | 0 | 19 | 0 | 0 | 19 |
|  | 10 | Virginia Avenue at Harrison Avenue | 4 hr | 0 | 0 | 1 | 2 | 3 | 0 | 2 | 9 | 4 | 15 | 18 | 11 | 4 | 14 | 47 | 76 | 59 | 20 | 49 | 204 |
|  | 11 | Virginia Avenue at Meade Avenue | 4 hr | 0 | 1 | 2 | 2 | 5 | 0 | 1 | 5 | 5 | 11 | 10 | 11 | 3 | 0 | 24 | 60 | 54 | 3 | 0 | 117 |
|  | 12 | Virginia Avenue at US 101 South | 16 hr | 1 | 0 | 3 | 1 | 5 | 11 | 0 | 7 | 5 | 23 | 5 | 7 | 7 | 13 | 32 | 156 | 54 | 75 | 109 | 394 |
|  | 13 | Virginia Avenue at US 101 North | 16 hr | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 5 | 1 | 4 | 2 | 2 | 9 | 54 | 31 | 20 | 31 | 136 |
|  | 14 | Marion Avenue at Safeway Driveway | 4 hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 4 | 2 | 4 | 2 | 0 | 8 | 11 | 16 | 9 | 0 | 36 |
|  | 15 | Washington Avenue at US 101 South/Sherman Avenue | 4 hr | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 4 | 5 | 2 | 2 | 12 | 21 | 7 | 7 | 2 | 27 | 43 |
|  | 16 | Pony Creek Road at Crowell Lane | 4 hr | 0 | 3 | 0 | 1 | 4 | 4 | 4 | 0 | 1 | 9 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 19 | 19 |
|  | 17 | Oak Street at 16th/17th Street | 4 hr | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 4 | 1 | 0 | 0 | 0 | 1 | 5 | 5 | 2 | 2 | 14 |
|  | 18 | Broadway Street at 16th Street | 4 hr | 3 | 1 | 0 | 1 | 5 | 10 | 3 | 3 | 3 | 19 | 4 | 0 | 8 | 0 | 12 | 10 | 1 | 17 | 10 | 38 |
|  | 19 | Broadway Avenue at 17th Street | 4 hr | 3 | 0 | 0 | 0 | 3 | 13 | 4 | 0 | 0 | 17 | 0 | 0 | 8 | 2 | 10 | 0 | 0 | 26 | 22 | 48 |
|  | 20 | US 101 at Mill Casino Entrance | 16 hr | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 0 | 6 | 0 | 8 | 0 | 0 | 8 | 2 | 105 | 2 | 26 | 135 |
|  | 21 | Newmark Avenue at Oak Street | 4 hr | 0 | 0 | 2 | 1 | 3 | 1 | 0 | 12 | 3 | 16 |  | 0 | 2 | 0 | 5 | 31 | 0 | 10 | 0 | 41 |
|  | 22 | Broadway Street at Newmark Avenue | 16 hr | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 3 | 10 | 21 | 0 | 8 | 5 | 2 | 15 | 62 | 64 | 75 | 37 | 238 |
|  | 23 | Newmark Street at Edgewood Drive | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 25 | 0 | 0 | 25 |
|  | 24 | Newmark Avenue at Brusells Street | 4 hr | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 6 | 0 | 4 | 0 | 2 | 6 | 1 | 19 | 1 | 12 | 33 |
|  | 25 | Newmark Street at Sherman Avenue | 16 hr | 0 | 0 | 0 | 1 | 1 | 6 | 7 | 0 | 7 | 20 | 0 | 1 | 1 | 4 | 6 | 13 | 35 | 24 | 42 | 114 |
|  | 26 | US 101 at Newmark Street | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 1 | 19 | 26 |
| $\begin{aligned} & \text { 翯 } \\ & \text { a } \\ & \text { o } \end{aligned}$ | 27 | Morrison Street at Lakeshore Drive | 4 hr | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 6 | 2 | 8 | 0 | 2 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 5 |
|  | 28 | Newmark Avenue at Cape Arago Highway/Empire Boulevard | 4 hr | 0 | 0 | 4 | 0 | 4 | 0 | 4 | 12 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 0 | 3 | 11 |
|  | 29 | Newmark Avenue at Morrison Street | 16 hr | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 15 | 3 | 21 | 9 | 3 | 0 | 0 | 12 | 83 | 71 | 11 | 13 | 178 |
|  | 30 | Newmark Avenue at Ocean Boulevard | 16 hr | 0 | 2 | 1 | 4 | 7 | 0 | 21 | 34 | 41 | 96 | 0 | 1 | 4 | 0 | 5 | 0 | 35 | 49 | 8 | 92 |
|  | 31 | Newmark Avenue at Laclair Street | 4 hr | 0 | 0 | 5 | 1 | 6 | 0 | 1 | 18 | 6 | 25 | 0 | 6 | 9 | 0 | 15 | 0 | 29 | 42 | 4 | 75 |
|  | 32 | Empire Boulevard at Pacific Avenue | 4 hr | 4 | 0 | 0 | 0 | 4 | 9 | 2 | 0 | 0 | 11 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 4 | 0 | 5 |
|  | 33 | Thompson Road at Woodland Drive | 4 hr | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 11 | 0 | 11 |
|  | 34 | Koosbay Boulevard at Thompson Road | 4 hr | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 0 | 8 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 13 | 14 |
|  | 35 | Ocean Boulevard at Woodland Drive | 4 hr | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 3 | 5 | 2 | 0 | 0 | 2 | 4 | 2 | 0 | 0 | 4 | 6 |
|  | 36 | Ocean Boulevard at Butler Road | 4 hr | 0 | 1 | 0 | 0 | 1 | 5 | 3 | 1 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 5 |
|  | 37 | Koosbay Boulevard at 10th Street | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
|  | 38 | Us 101 at Koosbay Blvd | 16 hr | 7 | 0 | 0 | 0 | 7 | 26 | 11 | 0 | 2 | 39 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 48 | 49 |
|  | 39 | 7th Street at Commercial Avenue | 4 hr | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 6 | 4 | 10 | 0 | 0 | 0 | 2 | 2 | 0 | 10 | 0 | 14 | 24 |
|  | 40 | Commercial Avenue at US 101 South | 16 hr | 4 | 0 | 1 | 0 | 5 | 39 | 0 | 4 | 0 | 43 | 8 | 4 | 11 | 14 | 37 | 77 | 76 | 116 | 191 | 460 |
|  | 41 | Commercial Avenue at US 101 North | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 9 | 11 |
|  | 42 | 10th Street at Central Avenue | 16 hr | 2 | 1 | 0 | 0 | 3 | 7 | 5 | 3 | 5 | 20 |  | 3 | 0 | 0 | 6 | 32 | 25 | 64 | 91 | 212 |
|  | 43 | Central Avenue at 7th Street | 4 hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 4 | 7 | 4 | 4 | 0 | 15 | 34 | 14 | 23 | 4 | 75 |
|  | 44 | 7th Street at Anderson Avenue | 4 hr | 1 | 1 | 0 | 1 | 3 | 4 | 2 | 0 | 5 | 11 | 0 | 16 | 0 | 10 | 26 | 0 | 86 | 0 | 61 | 147 |
|  | 45 | Elrod Avenue at 10th Street | 4 hr | 6 | 0 | 0 | 1 | 7 | 7 | 0 | 1 | 3 | 11 | 1 | 0 | 1 | 2 | 4 | 7 | 0 | 5 | 6 | 18 |
|  | 46 | 11th Street at Ingersoll Avenue | 4 hr | 0 | 0 | 0 | 0 | 0 |  | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 8 | 0 | 8 |
|  | 47 | 7th Street at Ingersoll Avenue | 4 hr | 1 | 0 | 0 | 0 | 1 | 3 | 3 | 0 | 1 | 7 | 0 | 2 | 4 | 0 | 6 | 0 | 11 | 10 | 3 | 24 |
|  | 48 | Hall Avenue at US 101 South | 4 hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 7 | 1 | 2 | 7 | 17 | 22 | 9 | 15 | 20 | 66 |
|  | 49 | Hall Avenue at US 101 North | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 20 | 0 | 0 | 3 | 2 | 5 | 9 | 1 | 8 | 9 | 27 |
|  | 50 | Johnson Avenue at US 101 South | 16 hr | 2 | 0 | 0 | 0 | 2 | 16 | 0 | 3 | 7 | 26 | 10 | 8 | 12 | 1 | 31 | 43 | 59 | 25 | 42 | 169 |
|  | 51 | Johnson Avenue at US 101 North | 16 hr | 0 | 3 | 0 | 0 | 3 | 0 | 15 | 8 | 5 | 28 | 6 | 10 | 1 |  | 22 | 50 | 86 | 44 | 27 | 207 |
|  | 52 | 7th Street at Lockhart Avenue/Southwest Boulevard | 4 hr | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 3 | 6 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 4 |
|  | 53 | 6th Avenue at D street / Coos River Highway | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 6 | 0 | 0 | 0 | 6 | 11 | 0 | 0 | 0 | 11 |
|  | 54 | Coos River Road at Ross Inlet Road | 4 hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |

## Appendix C

Volume Development



| N-SID | $\begin{gathered} \text { Synchro } \\ \text { ID } \end{gathered}$ | Intersection | Diection | Movenent | Existing Counts <br> 1-Hr Volume PM Peak | Existing <br> Heavy Vehicle <br> Count | Existing Heavy Vehicle Percentage | $\begin{gathered} \text { FHWA 5-13 } \\ \text { Heavy Vehicle } \\ \text { Count } \\ \hline \end{gathered}$ | FHWA 5-13 <br> Heavy Vehicle Percentage | Base Year Adjustment Factor | Seasonal Adjustment Factor | 30DHV <br> PM Peak | Balancing <br> Adjustments | $\qquad$ | Volumes for FIGURE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 15 | 150 | Wastingoto Ave at US 101 SouthSherman Ave |  | EBL | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 150 |  | E | евт | 1 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 1 | 0 | 1 | <5 |
|  | 150 | Count Date: 071122017 | ${ }^{\text {EB }}$ | EBR | 5 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 150 | 2017 |  | EBR2 | 4 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 150 |  |  | WEL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 150 |  | wв | wbt | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 150 | PM Peak Hour 4.15 PM-5:175 PM |  | WBr | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 150 | PM Peak Hour Used: 4.30 PM.5.30 PM |  | NBL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 150 |  | NB | nвt | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 150 |  | NB | NBR | 8 | 1 | 1\% | 3 | 3\% | 1.00 | 1.01 | 90 | 0 | 90 | 90 |
|  | 150 |  |  | NBR2 | 10 | 0 | \% | 0 | \% | 1.00 | 1.01 | 10 | 0 | 10 | 10 |
|  | 150 |  |  | SBL2 | 15 | 1 | 7\% | 2 | 13\% | 1.00 | 1.01 | 15 | 0 | 15 | 15 |
|  | 150 | PHF: |  | sbl | 754 | 14 | 2\% | 31 | 4\% | 1.00 | 1.01 | 760 | 50 | 810 | 810 |
|  | 150 | 0.92 | Sb | sbt | 123 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 125 | 10 | 135 | 135 |
|  | 150 |  |  | SBR | 14 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 15 | 0 | 15 | 15 |
|  | 150 <br> 150 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 150 |  | TEV | TEV | 1013 | 16 | 2\% | ${ }_{36}$ | 4\% |  |  | 1020 | 60 | 1086 | 1086 |
| 16 | 160 | Pony Creek Rd a C Cowell Lane |  | EBL | 30 | 0 | 0\% | 1 | 3\% | 1.00 | 1.01 | 30 | 0 | 30 | 30 |
|  | 160 |  | Eв | EBt | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 160 | Count Date: 0711120017 |  | EBR | 23 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 25 | 0 | 25 | 25 |
|  | 160 |  |  | WEL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 160 |  | wв | wbt | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 160 |  |  | WBR | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 160 | PM Peak Hour: 4.45 Pm .54 .45 PM |  | NBL | 32 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 30 | 0 | 30 | 30 |
|  | 160 | PM Peak Hour Useed: 4300 PM -5:30 PM | NB | NBT | 148 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 150 | 0 | 150 | 150 |
|  | 160 |  |  | NBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 160 |  |  | SBL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 160 | PHF: | sb | SBT | 131 | 0 | 0\% | 1 | 1\% | 1.00 | 1.01 | 130 | 0 | 130 | 130 |
|  | 160 | 0.78 |  | SBR | 38 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 40 | 0 | 40 | 40 |
|  | 160 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 160 |  | TEV | TEV | 402 | 0 | 0\% | 2 | 0\% |  |  | 405 | 0 | 405 | 405 |
| 17 | 170 | Oak Stat 16th17th St |  | EBL | 6 | 0 | \% | 1 | 17\% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 170 |  | Eв | Ebt | ${ }^{21}$ | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 20 | 0 | 20 | 20 |
|  | 170 | Count Date: $07 / 1112017$ |  | EBR | 21 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 20 | 0 | 20 | 20 |
|  | 170 |  |  | WBL | 7 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 170 |  | wB | wвт | 48 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 50 | 0 | 50 | 50 |
|  | 170 |  |  | wbr | 11 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 10 | 0 | 10 | 10 |
|  | 170 | PM Peak Hour: 4.45 Pm. 5.45 PM |  | NBL | ${ }^{28}$ | 0 | \% | 1 | 4\% | 1.00 | 1.01 | 30 | 0 | 30 | 30 |
|  | 170 | PM Peak Hour Useed: 430 PM P-5.30 PM | nв | nBt | 57 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 60 | 0 | 60 | 60 |
|  | 170 |  |  | NBR | 4 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 170 |  |  | SBL | 6 | 0 | \% | 0 | \% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 170 | PHF: | sb | SBt | ${ }^{58}$ | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 60 | 0 | 60 | 60 |
|  | 170 | 0.86 |  | SBR | 4 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  | 170 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 170 |  | tev | TEV | 271 | 0 | \% | 2 | 1\% |  |  | 275 | 0 | 275 | 275 |
| 18 | 180 | Broadway Stat 16 Ch St |  | EBL | ${ }^{23}$ | 0 | \% | 0 | \% | 1.00 | 1.02 | 25 | 0 | 25 | 25 |
|  | 180 |  | Eв | Ebt | 13 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 15 | 0 | 15 | 15 |
|  | 180 | Count Daie: 0711112017 |  | EBR | 2 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 2 | 0 | 2 | < |
|  | 180 | 2017 |  | WEL | 83 | 0 | 0\% | 1 | 1\% | 1.00 | 1.02 | 85 | 0 | 85 | 85 |
|  | 180 |  | wB | wbt | ${ }^{21}$ | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 20 | 0 | 20 | 20 |
|  | 180 |  |  | WBr | 12 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 10 | 0 | 10 | 10 |
|  | 180 | PM Peak Hour: 4:15 PM.5.15 PM |  | NBL | 6 | 0 | \% | 0 | 0\% | 1.00 | 1.02 | 5 | 0 | 5 | 5 |
|  | 180 | PM Peak Hour Used: : 430 PM.5:30 PM | NB | NBT | 660 | 1 | 0\% | 12 | 2\% | 1.00 | 1.02 | 675 | 0 | 675 | 675 |
|  | 180 |  |  | NBR | 42 | 0 | 0\% | 1 | 2\% | 1.00 | 1.02 | 45 | 0 | 45 | 45 |
|  | 180 |  |  | SBL | 10 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 10 | 0 | 10 | 10 |
|  | 180 | PHF: | sb | SBT | 653 | 5 | 1\% | 15 | 2\% | 1.00 | 1.02 | 665 | 0 | 665 | 665 |
|  | 180 | 0.89 |  | SBR | 25 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 25 | 0 | 25 | 25 |
|  | 180 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 180 |  | TEV | TEV | 1550 | 6 | \% | 29 | 2\% |  |  | 1582 | 0 | 1582 | 1582 |
| 19 | 190 | Broadway Ave at 17 Th St |  | EBL | 6 | 0 | \% | 0 | 0\% | 1.00 | 1.02 | 5 | 0 | 5 | 5 |
|  | 190 |  | ${ }_{\text {ев }}$ | Ebt | 0 | 0 | \% | 0 | 0\% | 1.00 | 1.02 | 0 | 1 | 1 | $<5$ |
|  | 190 | Count Date: 071112017 |  | EBR | 20 | 0 | 0\% | 1 | 5\% | 1.00 | 1.02 | 20 | 0 | 20 | 20 |
|  | 190 | 2017 |  | WEL |  | 0 | \% | 0 | 0\% | 1.00 | 1.02 | 5 | 0 | 5 | 5 |
|  | 190 |  | wB | wBt | 0 | 0 | \%\% | 0 | 0\% | 1.00 | 1.02 | 0 | 1 | 5 | ${ }^{<}$ |
|  | 190 |  |  | WBR | 4 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 5 | 0 | 5 | 5 |
|  | 190 | PM Peax Hour: 4:15 PM-5.15 PM |  | NBL | 40 | 0 | 0\% |  | 3\% | 1.00 | 1.02 | 40 | 0 | 40 | 40 |
|  | 190 | PM Peak Hour Used: 4:30 Pm. $5: 30 \mathrm{PM}$ | NB | NBT | 704 | 1 | 0\% | 8 | 1\% | 1.00 | 1.02 | 720 | O | ${ }^{720}$ | 720 |
|  | 190 |  |  | NBR | 3 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 5 | 0 | 5 | 5 |
|  | 190 |  |  | SBL | 2 | 0 | 0\% | 1 | 50\% | 1.00 | 1.02 | 2 | 0 | 2 | <5 |
|  | 190 | PHF: | SB | ${ }^{\text {SBT }}$ | ${ }^{741}$ | 5 | 1\% | 15 | 2\% | 1.00 | 1.02 | 755 | 0 | 755 | 755 |
|  | 190 | 0.88 |  | SBR | 3 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 5 | 0 | 5 | 5 |
|  | 190 |  | TEV | tev | 1526 | 6 | 0\% | 26 | 2\% |  |  | 1562 | 2 | 1564 | 1564 |
| ${ }^{20}$ | 200 | US 101 at Mili Casino Entrance |  | EBL | 5 | 0 | 0\% | 0 | 0\% | 1.008 | 1.18 | 5 | 0 | 5 | 5 |
|  | 200 |  | ев | Ebt |  |  | 0\% | - | 0\% | 1.008 | 1.18 |  |  | 2 | < |
|  | 200 | Count Date: 0412220016 |  | Ebr | 7 | 0 | 0\% | 0 | 0\% | 1.008 | 1.18 | 10 | 0 | 10 | 10 |
|  | 200 | 2016 |  | WEL | 75 | 0 | 0\% | 0 | 0\% | 1.008 | 1.18 | 90 | 0 | 90 | 90 |
|  | 200 |  | wB | wbt |  | 0 | 0\% | - | 0\% | 1.008 | 1.18 | 0 | 1 |  | < |
|  | 200 |  |  | WBr | 47 | 0 | 0\% | 0 | 0\% | 1.008 | 1.18 | 55 | 0 | 55 | 55 |
|  | 200 | PM Peak Hour 2.45 PM-3.45 PM |  | NBL | ${ }^{2}$ | 0 | 0\% | 0 | 0\% | 1.008 | 1.18 | $\stackrel{2}{2}$ | 0 | $\stackrel{2}{2}$ | $\stackrel{5}{5}$ |
|  | 200 | PM Peak Hour Used: 4.30 Pm P.5:30 PM | NB | nвт | ${ }^{726}$ | 10 | 1\% | ${ }^{27}$ | 4\% | 1.008 | 1.18 | 865 | -5 | 860 | 860 |
|  | 200 |  |  | NBR | 83 | 0 | 0\% | 0 | 0\% | 1.008 | 1.18 | 100 | 0 | 100 | 100 |
|  | 200 |  |  | SBL | 32 | 0 | 0\% | 1 | 3\% | 1.008 | 1.18 | 40 | 0 | 40 | 40 |
|  | 200 | PHF: | sB | SBT | 630 | 16 | 3\% | 29 | 5\% | 1.008 | 1.18 | 750 | -5 | 745 | 745 |
|  | 200 | 0.93 |  | SBR | 1 | 0 | 0\% |  | 0\% | 1.008 | 1.18 | 1 | 0 | 1 | <5 |
|  | ${ }^{200}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 200 |  | TEV | TEV | 1610 | 26 | 2\% | 57 | 4\% |  |  | 1920 | -9 | 1911 | 1911 |
| 21 | 210 <br> 210 <br> 210 <br> 210 <br> 210 <br> 210 <br> 210 <br> 210 <br> 210 <br> 210 <br> 210 | Newmark Ave at Oak St <br> Count Date : 07/11/2017 <br> 2017 <br> PM Peak Hour: 2:00 PM-3:00 PM <br> PM Peak Hour Used: 4:30 PM-5:30 PM <br> PHF: |  | EBL | 62 | 0 | 0\% | 1 | 2\% | 1.00 | 1.02 | 65 | 0 | 65 | 65 |
|  |  |  | ев | EBt | 915 | 2 | 0\% | 10 | 1\% | 1.00 | 1.02 | ${ }_{9} 95$ | 0 | 935 | 935 |
|  |  |  |  | EBR | 0 | 0 | 0\% |  | 0\% | 1.00 | 1.02 | 0 | 0 |  | 0 |
|  |  |  |  | WEL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  |  |  | wB | wBt | ${ }^{893}$ | 6 | 1\% | 16 | 2\% | 1.00 | 1.02 | 910 | 0 | 910 | 910 |
|  |  |  |  | WBR | 54 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 55 | 0 | 55 | 55 |
|  |  |  |  | NBL | 0 | 0 | 0\% |  | 0\% | 1.00 | 1.02 | 0 | 0 | 0 |  |
|  |  |  | Nв | NBT NBR | 0 | 0 | 0\% $0 \%$ | - | 0\% | 1.00 1.00 | 1.02 1.02 | 0 | 0 | 0 | 0 |
|  |  |  |  |  | 54 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 1.02 | ${ }_{55}$ | 0 | ${ }_{55}$ | ${ }_{5}$ |
|  |  |  | SB | SBT | 5 | 0 | 0\% | 0 | \%\% | 1.00 | 1.02 | 5 | 0 | 5 | S |




| N-SID | $\begin{gathered} \text { Synchro } \\ \text { ID } \end{gathered}$ | Intersection | Diection | Movement | Existing Counts <br> 1-Hr Volume PM Peak | Existing <br> Heavy Vehicle <br> Count | Existing <br> Heavy Vehicle <br> Percentage | $\qquad$ | FHWA 5-13 Heavy Vehicle Percentage | $\begin{gathered} \hline \text { Base } \\ \text { Year } \\ \text { Adjustment } \\ \text { Factor } \\ \hline \end{gathered}$ | Seasonal <br> Adjustment Factor | 30DHV <br> PM Peak | Balancing <br> Adjustments | 30th Highest Hour 2017 Balanced Volumes PM Peak | Volumes for FIGURE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1090 |  |  | SBL | 261 | 0 | \% | 1 | 0\% | 1.00 | 1.01 | 265 | 0 | 265 | 265 |
|  | 1090 | PHF: | sв | SBt | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1090 | 0.91 |  | SBR | 145 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 145 | 0 | 145 | 145 |
|  | 1090 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1090 |  | TEV | TEV | 1492 | 2 | 0\% | 8 | 1\% |  |  | 1505 | 0 | 1505 | 1505 |
| ${ }^{36}$ | 1100 | ean Blvd at Butuer Rd |  | EBL | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1100 |  | ев | евт | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1100 | Count Date :0711220017 |  | EBR | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1100 | 2017 |  | WEL | 14 | 0 | \% | 0 | \% | 1.00 | 1.01 | 15 | 0 | 15 | 15 |
|  | 1100 |  | wв | wbt | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1100 |  |  | wbr | 50 | 0 | \% | 0 | \% | 1.00 | 1.01 | 50 | 0 | 50 | 50 |
|  | 1100 | PM Peak Hour: 4.45 PM-5.45 PM |  | NBL | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1100 | PM Peak Hor Used: 4:30 PM:5.30 PM | NB | nBt | 534 | 4 | 1\% | 6 | 1\% | 1.00 | 1.01 | 540 | 0 | 540 | 540 |
|  | 1100 |  |  | NBR | 13 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 15 | 0 | 15 | 15 |
|  | 1100 |  |  | SBL | ${ }^{37}$ | 0 | \% | 0 | \% | 1.00 | 1.01 | 35 | 0 | 35 | 35 |
|  | 1100 | PHF: | SB | SBT | 619 | 4 | 1\% | 10 | 2\% | 1.00 | 1.01 | 625 | 0 | 625 | 625 |
|  | 1100 | 0.85 |  | SBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1100 |  | TEV | TEV | 1267 | 8 | 1\% | 16 | 1\% |  |  | 1280 | 0 | 1280 | 1280 |
| ${ }^{37}$ | 1110 | Koossay Blvd at 10 St St |  | EBL | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1110 |  | EB | EBt | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1110 | Count Date :0711220017 |  | EBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1110 | 2017 |  | WEL | 40 | 0 | 0\% | 1 | 3\% | 1.00 | 1.01 | 40 | 0 | 40 | 40 |
|  | 1110 |  | wB | wвт | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1110 |  |  | wbr | 125 | 0 | \% | 3 | 2\% | 1.00 | 1.01 | 125 | 0 | 125 | 125 |
|  |  | PM Peak Hour: 4:30 Pm-5.30 PM |  | NBL | 0 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  |  | PM Peak Hori Used: 4:30 PM-5.30 PM | NB | NBT | 181 | 0 | 0\% | 1 | 1\% | 1.00 | 1.01 | 185 | 0 | 185 | 185 |
|  | 1110 |  |  | NBR | 31 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 30 | 0 | 30 | 30 |
|  | 1110 |  |  | SBL | 172 | 0 | \% | 0 | \% | 1.00 | 1.01 | 175 | 0 | 175 | 175 |
|  |  | PHF: | SB | SBT | 196 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 200 | 0 | 200 | 200 |
|  | 1110 | 0.85 |  | SBR | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1110 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1110 |  | tev | tev | 745 | 0 | 0\% | 5 | 1\% |  |  | 755 | 0 | 755 | 755 |
| ${ }^{38}$ | 1120 | US 101 at Kooshay Blvd |  | EBL | 16 | 0 | \% | 0 | \% | 1.00 | 1.02 | 15 | 0 | 15 | 15 |
|  | 1120 |  | Eв | Ebt | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  | 1120 | Count Date: 071112017 |  | EBR | 153 | 1 | 1\% | 3 | 2\% | 1.00 | 1.02 | 155 | 0 | 155 | 155 |
|  | 1120 | 2017 |  | WEL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  | 1120 |  | wB | wвт | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  | 1120 |  |  | wbr | 0 | 0 | \% | 0 | \% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  |  | PM Peak Hour: 4.30 PM.5.30 PM |  | NBL | 86 |  | 1\% | 4 | 5\% | 1.00 | 1.02 | 90 | 0 | 90 | 90 |
|  | 1120 | PM Peak Hor Used: 4:30 PM.5.30 PM | NB | NBT | 981 | ${ }^{23}$ | 2\% | 41 | 4\% | 1.00 | 1.02 | 1000 | 0 | 1000 | 1000 |
|  | 1120 |  |  | NBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  | 1120 |  |  | SBL | 0 | 0 | \% | 0 | 0\% | 1.00 | 1.02 | 0 | 0 | 0 | 0 |
|  | 1120 | PHF: | sb | Sbt | 1097 | ${ }^{25}$ | 2\% | 51 | 5\% | 1.00 | 1.02 | 1120 | 0 | 1120 | 1120 |
|  | 1120 | 0.91 |  | SBR | 33 | 0 | 0\% | 0 | 0\% | 1.00 | 1.02 | 35 | 0 | 35 | 35 |
|  | 1120 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1120 |  | tev | TEV | 2366 | 50 | 2\% | 99 | 4\% |  |  | 2415 | 0 | 2415 | 2415 |
| 39 | 1130 | 7 th Stat Commercial Ave |  | EBL | 0 | 0 | \% | 0 | \% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 |  | Eв | Ebt | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 | Count Date: 0991220017 |  | EBR | 45 | 1 | 2\% | 2 | 4\% | 1.00 | 1.03 | 45 | 0 | 45 | 45 |
|  | 1130 | 2017 |  | WEL | 437 | 0 | 0\% | 3 | 1\% | 1.00 | 1.03 | 450 | 0 | 450 | 450 |
|  | 1130 |  | wB | wBt | 187 | 0 | \% | 1 | 1\% | 1.00 | 1.03 | 195 | 0 | 195 | 195 |
|  | 1130 |  |  | WBr | 0 | 0 | \% | 0 | \% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 | PM Peak Hour: 2:00 PM.3.00 PM |  | NBL | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 | PM Peak Hor Used: 4:30 PM-5.30 PM | NB | NBT | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 |  |  | NBR | 0 | 0 | \% | 0 | \% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 |  |  | SBL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 | PHF: | sB | SBt | 0 | 0 | \% | 0 | \% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 | 0.88 |  | SBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.03 | 0 | 0 | 0 | 0 |
|  | 1130 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1130 |  | TEV | TEV | 669 | 1 | 0\% | 6 | 1\% |  |  | 690 | 0 | 690 | 690 |
| 40 | 1140 | Commercial Ave at US 101 South |  | EBL | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 |  | ев | EBt | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 | Count Date :071112017 |  | EBR | 0 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 | 2017 |  | WEL | 34 | 0 | 0\% | 1 | 3\% | 1.00 | 1.01 | 35 | 0 | 35 | 35 |
|  | 1140 |  | wB | wBt | 291 | 0 | \%\% | 9 | ${ }^{3 \%}$ | 1.00 | 1.01 | 295 | 0 | 295 | 295 |
|  | 1140 |  |  | wbr | 0 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 | PM Peak Hour: 4:30 Pm-5.30 PM |  | NBL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 | PM Peak Hour Used: : 430 PM P. 530 PM | NB | ${ }^{\text {NBT }}$ | 0 | 0 | \%\% | 0 | \%\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 |  |  | NBR | , | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1140 |  |  | SBL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | ${ }^{1140}$ | PHF: | sв | SBT | ${ }^{1211}$ | 18 | 1\% | ${ }^{33}$ | ${ }^{3 \%}$ | 1.00 | 1.01 | ${ }^{1225}$ | 0 | ${ }^{1225}$ | ${ }^{1225}$ |
|  | 1140 | 0.95 |  | SBR | 87 | 0 | 0\% | 2 | 2\% | 1.00 | 1.01 | 90 | 0 | 90 | 90 |
|  | 1140 |  | TEV | TEV | 1623 | 18 | 1\% | 45 | 3\% |  |  | 1645 | 0 | 1645 | 1645 |
| ${ }^{41}$ | 1150 | Commercial Ave at US 101 North |  |  | 0 | 0 | 0\% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 |  | ${ }_{\text {EB }}$ | EBt | 0 | 0 | 0\% | 0 | \%\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 | Count Date: 0711220017 |  | EBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 | 2017 |  | WEL | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 |  | wB | wbt | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 |  |  | WBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 | PM Peak Hour 2:15 PM-3:15 PM |  | NBL | 276 | 1 | 0\% | 4 | 1\% | 1.00 | 1.01 | 280 | 0 | 280 | 280 |
|  | 1150 | PM Peak Hor Useed: 4.30 PM-5.30 PM | NB | NBT | 1109 | ${ }^{37}$ | 3\% | 70 | 6\% | 1.00 | 1.01 | 1120 | 0 | 1120 | 1120 |
|  | 1150 |  |  | NBR | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 |  |  | sbl | 0 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 | PHF: | sB | sbt | 0 | 0 | \% | 0 | \% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 | 0.95 |  | SBR | 0 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 0 | 0 | 0 | 0 |
|  | 1150 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1150 |  | TEV | TEV | 1385 | 38 | 3\% | 74 | 5\% |  |  | 1400 | 0 | 1400 | 1400 |
| ${ }^{42}$ | $\begin{aligned} & 1160 \\ & 1160 \\ & 1160 \\ & 1160 \\ & 1160 \\ & 1160 \\ & 1160 \\ & 1160 \end{aligned}$ | 10th St at Central Ave <br> Count Date : 07/11/2017 <br> 2017 <br> PM Peak Hour: 4:45 PM-5:45 PM <br> PM Peak Hour Used: 4:30 PM-5:30 PM |  | EBL | 15 | 0 | \% | 0 | 0\% | 1.00 | 1.01 | 15 | 0 | 15 | 15 |
|  |  |  | ев | EBT | 515 | 0 | 0\% | 6 | 1\% | 1.00 | 1.01 | 520 | 0 | 520 | 520 |
|  |  |  |  | EBR | 114 | 0 | 0\% | 2 | 2\% | 1.00 | 1.01 | 115 | 0 | 115 | 115 |
|  |  |  |  | WEL | 6 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 5 | 0 | 5 | 5 |
|  |  |  | wв | ${ }_{\text {WBT }}$ | ${ }_{4}^{411}$ | 2 | \%\% | ${ }^{12}$ | 3\% | 1.00 | 1.01 | 415 | 0 | 415 | 415 |
|  |  |  |  | WBR | 16 | 0 | 0\% | 0 | 0\% | 1.00 | 1.01 | 15 | 0 | 15 | 15 |
|  |  |  | NB | NBL NBT | 165 94 | 0 | 0\% | 0 | 0\% | 1.00 1.00 | 1.01 1.01 | 165 95 | 0 | 165 95 | 165 95 |




## Appendix D

Synchro Worksheets

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 6.6 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | * |  |  | * |  |  | $\$$ |  |  | \$ |  |
| Traffic Vol, veh/h | 0 | 0 | 0 | 10 | 0 | 5 | 0 | 1 | 10 | 5 | 1 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 10 | 0 | 5 | 0 | 1 | 10 | 5 | 1 | 0 |
| Conflicting Peds, \#/hr | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 0 | 14 | 0 | 7 | 0 | 1 | 14 | 7 | 1 | 0 |



| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 0.7 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | \$ |  |  | \& |  |  | \$ |  |  | $\ddagger$ |  |
| Traffic Vol, veh/h | 1 | 120 | 10 | 2 | 55 | 1 | 5 | 1 | 1 | 1 | 2 | 1 |
| Future Vol, veh/h | 1 | 120 | 10 | 2 | 55 | 1 | 5 | 1 | 1 | 1 | 2 | 1 |
| Conflicting Peds, \#/hr | 3 | 0 | 3 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 1 | 160 | 13 | 3 | 73 | 1 | 7 | 1 | 1 | 1 | 3 | 1 |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |



c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 195 | 0 | - | 0 | 311 | 184 |
| Stage 1 | - | - | - | - | 184 | - |
| Stage 2 | - | - | - | - | 127 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1390 | - | - | - | 686 | 864 |
| Stage 1 | - | - | - | - | 852 | - |
| Stage 2 | - | - | - | - | 904 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1390 | - | - | - | 683 | 864 |
| Mov Cap-2 Maneuver | - | - | - | - | 683 | - |
| Stage 1 | - | - | - | - | 848 | - |
| Stage 2 | - | - | - | - | 904 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 0.4 |  | 0 |  | 10 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT WBT |  | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1390 | - | - | - | 726 |
| HCM Lane V/C Ratio |  | 0.004 | - | - | - | 0.011 |
| HCM Control Delay (s) |  | 7.6 | 0 | - | - | 10 |
| HCM Lane LOS |  | A | A | - | - | B |
| HCM 95th \%tile Q(veh) |  | 0 | - | - | - | 0 |




| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 2.7 |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  | 4 | 个 | $\mathbf{7}$ | r |  |
| Traffic Vol, veh/h | 0 | 230 | 345 | 110 | 155 | 15 |
| Future Vol, veh/h | 0 | 230 | 345 | 110 | 155 | 15 |
| Conflicting Peds, \#/hr | 6 | 0 | 0 | 6 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Stop |
| Storage Length | - | - | - | 0 | 0 | - |
| Veh in Median Storage, \# | - | 0 | 0 | - | 0 | - |
| Grade, \% | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 245 | 367 | 117 | 165 | 16 |


| Major/Minor M | Major1 |  |  |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | - | 0 | - | 0 | 618 | 374 |
| Stage 1 | - | - | - | - | 373 | - |
| Stage 2 | - | - | - | - | 245 | - |
| Critical Hdwy | - | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 0 | - | - | - | 456 | 677 |
| Stage 1 | 0 | - | - | - | 701 | - |
| Stage 2 | 0 | - | - | - | 800 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | - | - | - | - | 451 | 672 |
| Mov Cap-2 Maneuver | - | - | - | - | 543 | - |
| Stage 1 | - | - | - | - | 697 | - |
| Stage 2 | - | - | - | - | 795 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | B |  | SB |  |
| HCM Control Delay, s | 0 |  | 0 |  | 13.7 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt EBT WBT WBR SBLn1 |  |  |  |  |  |  |
| Capacity (veh/h) |  | - | - | - | 596 |  |
| HCM Lane V/C Ratio |  | - | - | - | 0.303 |  |
| HCM Control Delay (s) |  | - | - | - | 13.7 |  |
| HCM Lane LOS |  | - | - | - | B |  |
| HCM 95th \%tile Q(veh) |  | - | - | - | 1.3 |  |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{7}$ | 性 |  | \％ | 个t |  |  | $\uparrow$ | 「 | ${ }^{7}$ | $\uparrow$ |  |
| Traffic Volume（vph） | 20 | 300 | 115 | 395 | 300 | 10 | 155 | 40 | 395 | 45 | 45 | 15 |
| Future Volume（vph） | 20 | 300 | 115 | 395 | 300 | 10 | 155 | 40 | 395 | 45 | 45 | 15 |
| Ideal Flow（vphpl） | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time（s） | 4.0 | 4.0 |  | 4.0 | 4.0 |  |  | 4.0 | 5.0 | 4.0 | 4.0 |  |
| Lane Util．Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frpb，ped／bikes | 1.00 | 0.99 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Flpb，ped／bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.96 |  | 1.00 | 1.00 |  |  | 1.00 | 0.85 | 1.00 | 0.96 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.96 | 1.00 | 0.95 | 1.00 |  |
| Satd．Flow（prot） | 1662 | 3162 |  | 1646 | 3305 |  |  | 1677 | 1473 | 1662 | 1677 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.73 | 1.00 | 0.52 | 1.00 |  |
| Satd．Flow（perm） | 1662 | 3162 |  | 1646 | 3305 |  |  | 1268 | 1473 | 904 | 1677 |  |
| Peak－hour factor，PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj．Flow（vph） | 22 | 323 | 124 | 425 | 323 | 11 | 167 | 43 | 425 | 48 | 48 | 16 |
| RTOR Reduction（vph） | 0 | 37 | 0 | 0 | 2 | 0 | 0 | 0 | 90 | 0 | 11 | 0 |
| Lane Group Flow（vph） | 22 | 410 | 0 | 425 | 332 | 0 | 0 | 210 | 335 | 48 | 53 | 0 |
| Confl．Peds．（\＃／hr） | 7 |  | 8 | 8 |  | 7 | 5 |  |  |  |  | 5 |
| Heavy Vehicles（\％） | 0\％ | 0\％ | 1\％ | 1\％ | 0\％ | 0\％ | 0\％ | 0\％ | 1\％ | 0\％ | 0\％ | 0\％ |
| Turn Type | Split | NA |  | Split | NA |  | Perm | NA | pt＋ov | Perm | NA |  |
| Protected Phases | 2 | 2 |  | 6 | 6 |  |  | 8 | 86 |  | ， |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | ， |  |  |
| Actuated Green，G（s） | 14.9 | 14.9 |  | 24.0 | 24.0 |  |  | 16.0 | 45.5 | 16.0 | 16.0 |  |
| Effective Green， g （s） | 15.4 | 15.4 |  | 25.5 | 25.5 |  |  | 17.0 | 40.0 | 17.0 | 17.0 |  |
| Actuated g／C Ratio | 0.22 | 0.22 |  | 0.36 | 0.36 |  |  | 0.24 | 0.57 | 0.24 | 0.24 |  |
| Clearance Time（s） | 4.5 | 4.5 |  | 5.5 | 5.5 |  |  | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension（s） | 2.5 | 2.5 |  | 2.5 | 2.5 |  |  | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap（vph） | 366 | 696 |  | 600 | 1205 |  |  | 308 | 842 | 219 | 407 |  |
| v／s Ratio Prot | 0.01 | c0．13 |  | c0．26 | 0.10 |  |  |  | 0.23 |  | 0.03 |  |
| v／s Ratio Perm |  |  |  |  |  |  |  | c0．17 |  | 0.05 |  |  |
| v／c Ratio | 0.06 | 0.59 |  | 0.71 | 0.28 |  |  | 0.68 | 0.40 | 0.22 | 0.13 |  |
| Uniform Delay，d1 | 21.5 | 24.4 |  | 19.0 | 15.7 |  |  | 24.0 | 8.3 | 21.1 | 20.7 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Incremental Delay，d2 | 0.1 | 1.1 |  | 3.5 | 0.1 |  |  | 5.6 | 0.2 | 0.4 | 0.1 |  |
| Delay（s） | 21.6 | 25.5 |  | 22.6 | 15.8 |  |  | 29.6 | 8.5 | 21.5 | 20.8 |  |
| Level of Service | C | C |  | C | B |  |  | C | A | C | C |  |
| Approach Delay（s） |  | 25.3 |  |  | 19.6 |  |  | 15.5 |  |  | 21.1 |  |
| Approach LOS |  | C |  |  | B |  |  | B |  |  | C |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 19.7 |  | HCM 2000 | Level of | ervice |  | B |  |  |  |
| HCM 2000 Control Delay to Capacity ratio |  |  | 0.70 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length（s） |  |  | 69.9 |  | Sum of los | time（s） |  |  | 14.5 |  |  |  |
| Intersection Capacity Utilization |  |  | 67．4\％ |  | CU Level | f Service |  |  | C |  |  |  |
| Analysis Period（min） |  |  | 15 |  |  |  |  |  |  |  |  |  |

c Critical Lane Group

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | \% | 中t |  | ${ }^{7}$ | 中 ${ }^{\text {c }}$ |  | ${ }^{7}$ | F |  |  | ¢ |  |
| Traffic Volume (vph) | 5 | 770 | 55 | 48 | 796 | 1 | 50 | 1 | 70 | 10 | 1 | 5 |
| Future Volume (vph) | 5 | 770 | 55 | 48 | 796 | 1 | 50 | 1 | 70 | 10 | 1 | 5 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.5 | 6.5 |  | 4.5 | 6.5 |  | 4.5 | 4.5 |  |  | 4.5 |  |
| Lane Util. Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  | 1.00 | 1.00 |  |  | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.99 |  |  | 0.99 |  |
| Flpb, ped/bikes | 0.99 | 1.00 |  | 1.00 | 1.00 |  | 0.99 | 1.00 |  |  | 1.00 |  |
| Frt | 1.00 | 0.99 |  | 1.00 | 1.00 |  | 1.00 | 0.85 |  |  | 0.96 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.97 |  |
| Satd. Flow (prot) | 1649 | 3283 |  | 1662 | 3324 |  | 1651 | 1470 |  |  | 1519 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.75 | 1.00 |  |  | 0.86 |  |
| Satd. Flow (perm) | 1649 | 3283 |  | 1662 | 3324 |  | 1297 | 1470 |  |  | 1342 |  |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 5 | 837 | 60 | 52 | 865 | 1 | 54 | 1 | 76 | 11 | 1 | 5 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 5 | 892 | 0 | 52 | 866 | 0 | 54 | 17 | 0 | 0 | 13 | 0 |
| Confl. Peds. (\#/hr) | 18 |  | 11 | 11 |  | 18 | 14 |  | 4 | 4 |  | 14 |
| Heavy Vehicles (\%) | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 10\% | 0\% | 0\% |
| Turn Type | Prot | NA |  | Prot | NA |  | Perm | NA |  | Perm | NA |  |
| Protected Phases | 1 | 6 |  | 5 | 2 |  |  | 8 |  |  | 4 |  |


| Permitted Phases |  |  |  |  | 8 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | 4 |
| Actuated Green, G (s) | 0.7 | 32.0 | 4.4 | 35.7 |  |  | 13.8 | 13.8 | 13.8 |
| Effective Green, g (s) | 0.7 | 32.0 | 4.4 | 35.7 | 13.8 | 13.8 | 13.8 |
| Actuated g/C Ratio | 0.01 | 0.49 | 0.07 | 0.54 | 0.21 | 0.21 | 0.21 |
| Clearance Time (s) | 4.5 | 6.5 | 4.5 | 6.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 2.0 | 4.8 | 2.5 | 4.8 | 2.5 | 2.5 | 2.5 |
| Lane Grp Cap (vph) | 17 | 1599 | 111 | 1806 | 272 | 308 | 281 |
| v/s Ratio Prot | 0.00 | c0.27 | c0.03 | c0.26 |  | 0.01 |  |
| v/s Ratio Perm |  |  |  |  | c0.04 |  | 0.01 |
| v/c Ratio | 0.29 | 0.56 | 0.47 | 0.48 | 0.20 | 0.06 | 0.05 |
| Uniform Delay, d1 | 32.3 | 11.9 | 29.5 | 9.3 | 21.4 | 20.7 | 20.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.5 | 0.7 | 2.3 | 0.4 | 0.3 | 0.1 | 0.0 |
| Delay (s) | 35.7 | 12.6 | 31.8 | 9.7 | 21.7 | 20.8 | 20.8 |
| Level of Service | D | B | C | A | C | C | C |
| Approach Delay (s) |  | 12.7 |  | 10.9 |  | 21.1 | 20.8 |
| Approach LOS |  | B |  | B |  | C | C |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 12.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.45 |  | 15.5 |
| Actuated Cycle Length (s) | 65.7 | Sum of lost time (s) | B |
| Intersection Capacity Utilization | $59.4 \%$ | ICU Level of Service |  |
| Analysis Period (min) | 15 |  |  |

c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 4.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | * $\uparrow$ |  |  | 中 ${ }^{\text {a }}$ |  |  | \& |  |  | \& |  |
| Traffic Vol, veh/h | 255 | 515 | 0 | 0 | 730 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Future Vol, veh/h | 255 | 515 | 0 | 0 | 730 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Conflicting Peds, \#/hr | 10 | 0 | 11 | 11 | 0 | 10 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 280 | 566 | 0 | 0 | 802 | 16 | 5 | 1 | 16 | 5 | 0 | 121 |




C Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 6.1 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | 1 |  |  | - |
| Traffic Vol, veh/h | 95 | 55 | 25 | 60 | 60 | 35 |
| Future Vol, veh/h | 95 | 55 | 25 | 60 | 60 | 35 |
| Conflicting Peds, \#/hr | 2 | 4 | 0 | 2 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 2 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 101 | 59 | 27 | 64 | 64 | 37 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 228 | 65 | 0 | 0 | 93 | 0 |
| Stage 1 | 61 | - | - | - | - | - |
| Stage 2 | 167 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.22 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.318 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 765 | 999 | - | - | 1514 | - |
| Stage 1 | 967 | - | - | - | - | - |
| Stage 2 | 867 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 729 | 993 | - | - | 1511 | - |
| Mov Cap-2 Maneuver | 729 | - | - | - | - | - |
| Stage 1 | 923 | - | - | - | - | - |
| Stage 2 | 865 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 10.5 |  | 0 |  | 4.7 |  |
| HCM LOS | B |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRWBLn1 |  | SBL | SBT |
| Capacity (veh/h) |  | - | - | 808 | 1511 | - |
| HCM Lane V/C Ratio |  | - | - | 0.197 | 0.042 | - |
| HCM Control Delay (s) |  | - | - | 10.5 | 7.5 | 0 |
| HCM Lane LOS |  | - | - | B | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 0.7 | 0.1 | - |




| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 2.1 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Mr |  |  | -1 | F |  |
| Traffic Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Future Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Conflicting Peds, \#/hr | 0 | 0 | 4 | 0 | 0 | 4 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 38 | 32 | 38 | 192 | 167 | 51 |



| Intersection |  |
| :--- | ---: | :--- |
| Intersection Delay, s/veh | 7.7 |
| Intersection LOS | A |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | \& |  |  | \& |  |  | \& |  |  | ¢ |  |
| Traffic Vol, veh/h | 5 | 20 | 20 | 5 | 50 | 10 | 30 | 60 | 5 | 5 | 60 | 5 |
| Future Vol, veh/h | 5 | 20 | 20 | 5 | 50 | 10 | 30 | 60 | 5 | 5 | 60 | 5 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 6 | 23 | 23 | 6 | 58 | 12 | 35 | 70 | 6 | 6 | 70 | 6 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Right | NB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.4 |  |  | 7.7 |  |  | 7.9 |  |  | 7.7 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $32 \%$ | $11 \%$ | $8 \%$ | $7 \%$ |
| Vol Thru, \% | $63 \%$ | $44 \%$ | $77 \%$ | $86 \%$ |
| Vol Right, \% | $5 \%$ | $44 \%$ | $15 \%$ | $7 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 95 | 45 | 65 | 70 |
| LT Vol | 30 | 5 | 5 | 5 |
| Through Vol | 60 | 20 | 50 | 60 |
| RT Vol | 5 | 20 | 10 | 5 |
| Lane Flow Rate | 110 | 52 | 76 | 81 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.129 | 0.061 | 0.09 | 0.097 |
| Departure Headway (Hd) | 4.217 | 4.166 | 4.307 | 4.28 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 836 | 863 | 835 | 842 |
| Service Time | 2.311 | 2.174 | 2.315 | 2.28 |
| HCM Lane V/C Ratio | 0.132 | 0.06 | 0.091 | 0.096 |
| HCM Control Delay | 7.9 | 7.4 | 7.7 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.2 | 0.3 | 0.3 |



C Critical Lane Group



c Critical Lane Group


|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |

C Critical Lane Group



c Critical Lane Group


C Critical Lane Group


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 4.9 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | $\uparrow$ |  |  | -1 | Y |  |
| Traffic Vol, veh/h | 50 | 1 | 40 | 55 | 5 | 95 |
| Future Vol, veh/h | 50 | 1 | 40 | 55 | 5 | 95 |
| Conflicting Peds, \#/hr | 0 | 2 | 2 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, \% | 2 | 0 | 0 | 2 | 0 | 0 |
| Mvmt Flow | 56 | 1 | 44 | 61 | 6 | 106 |


| Major/Minor M | Major1 |  | Major2 |  | Minor1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 0 | 0 | 59 | 0 | 208 | 59 |
| Stage 1 | - | - | - | - | 59 | - |
| Stage 2 | - | - | - | - | 149 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1558 | - | 785 | 1012 |
| Stage 1 | - | - | - | - | 969 | - |
| Stage 2 | - | - | - | - | 884 | - |
| Platoon blocked, \% | - | - |  | - |  |  |
| Mov Cap-1 Maneuver | - | - | 1555 | - | 761 | 1010 |
| Mov Cap-2 Maneuver | - | - | - | - | 761 | - |
| Stage 1 | - | - | - | - | 939 | - |
| Stage 2 | - | - | - | - | 884 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | NB |  |
| HCM Control Delay, s | 0 |  | 3.1 |  | 9.1 |  |
| HCM LOS |  |  |  |  | A |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBLn1 | EBT | EBR | WBL WBT |  |
| Capacity (veh/h) |  | 994 | - | - | 1555 | - |
| HCM Lane V/C Ratio |  | 0.112 | - |  | 0.029 | - |
| HCM Control Delay (s) |  | 9.1 | - | - | 7.4 | 0 |
| HCM Lane LOS |  | A | - | - | A | A |
| HCM 95th \%tile Q(veh) |  | 0.4 | - | - | 0.1 | - |




| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh 2.9 |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ${ }^{*}$ | 㻢 |  | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  |  | $\uparrow$ |  |  | $\uparrow$ |  |
| Traffic Vol, veh/h | 5 | 605 | 30 | 160 | 730 | 5 | 10 | 1 | 150 | 5 | 1 | 2 |
| Future Vol, veh/h | 5 | 605 | 30 | 160 | 730 | 5 | 10 | 1 | 150 | 5 | 1 | 2 |
| Conflicting Peds, \#/hr | 9 | 0 | 3 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 200 | - | - | 200 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 5 | 637 | 32 | 168 | 768 | 5 | 11 | 1 | 158 | 5 | 1 | 2 |





| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.8 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | $\uparrow$ |  |  | -1 |
| Traffic Vol, veh/h | 35 | 2 | 425 | 40 | 5 | 375 |
| Future Vol, veh/h | 35 | 2 | 425 | 40 | 5 | 375 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 2 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 1 |
| Mvmt Flow | 37 | 2 | 452 | 43 | 5 | 399 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 885 | 476 | 0 | 0 | 497 | 0 |
| Stage 1 | 476 | - | - | - | - | - |
| Stage 2 | 409 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 318 | 593 | - | - | 1077 | - |
| Stage 1 | 629 | - | - | - | - | - |
| Stage 2 | 675 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 315 | 592 | - | - | 1075 | - |
| Mov Cap-2 Maneuver | 315 | - | - | - | - | - |
| Stage 1 | 624 | - | - | - | - | - |
| Stage 2 | 675 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 17.7 |  | 0 |  | 0.1 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRWBLn1 |  | SBL | SBT |
| Capacity (veh/h) |  | - | - | 323 | 1075 | - |
| HCM Lane V/C Ratio |  | - | - | 0.122 | 0.005 | - |
| HCM Control Delay (s) |  | - | - | 17.7 | 8.4 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 0.4 | 0 | - |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 4.1 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | T | $\mathbf{7}$ | $\mathbf{F}$ |  | a | 4 |
| Traffic Vol, veh/h | 40 | 190 | 300 | 25 | 121 | 349 |
| Future Vol, veh/h | 40 | 190 | 300 | 25 | 121 | 349 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 1 | 1 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | 60 | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 43 | 202 | 319 | 27 | 129 | 371 |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 6.4 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | M |  |  | 4 | l |  |
| Traffic Vol, veh/h | 75 | 195 | 105 | 235 | 192 | 33 |
| Future Vol, veh/h | 75 | 195 | 105 | 235 | 192 | 33 |
| Conflicting Peds, \#/hr | 1 | 0 | 1 | 0 | 0 | 1 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | 60 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 82 | 214 | 115 | 258 | 211 | 36 |


| Major/Minor M | Minor2 |  | Major1 |  | ajor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 719 | 230 | 248 | 0 | - | 0 |
| Stage 1 | 230 | - | - | - | - | - |
| Stage 2 | 489 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | 4.11 | - | - | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | 2.209 | - | - | - |
| Pot Cap-1 Maneuver | 398 | 814 | 1324 | - | - | - |
| Stage 1 | 813 | - | - | - | - | - |
| Stage 2 | 621 | - | - | - | - | - |
| Platoon blocked, \% |  |  |  | - | - | - |
| Mov Cap-1 Maneuver | 363 | 813 | 1323 | - | - | - |
| Mov Cap-2 Maneuver | 363 | - | - | - | - | - |
| Stage 1 | 741 | - | - | - | - | - |
| Stage 2 | 620 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | NB |  | SB |  |
| HCM Control Delay, s | 16.5 |  | 2.5 |  | 0 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBL NBT EBLn1 |  |  | SBT | BR |
| Capacity (veh/h) |  | 1323 | - | 605 | - | - |
| HCM Lane V/C Ratio |  | 0.087 | - | 0.49 | - | - |
| HCM Control Delay (s) |  | 8 | - | 16.5 | - | - |
| HCM Lane LOS |  | A | - | C | - | - |
| HCM 95th \%tile Q(veh) |  | 0.3 | - | 2.7 | - | - |



|  | $\bigcirc$ | 4 |  |  |  | 1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |  |
| Lane Configurations | ${ }^{7}$ | 「 | $\uparrow$ |  | ${ }^{7}$ | 4 |  |
| Traffic Volume (vph) | 15 | 50 | 540 | 15 | 35 | 625 |  |
| Future Volume (vph) | 15 | 50 | 540 | 15 | 35 | 625 |  |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |  |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.85 | 1.00 |  | 1.00 | 1.00 |  |
| Flt Protected | 0.95 | 1.00 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1488 | 1727 |  | 1662 | 1733 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 |  | 0.38 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1488 | 1727 |  | 669 | 1733 |  |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |  |
| Adj. Flow (vph) | 18 | 59 | 635 | 18 | 41 | 735 |  |
| RTOR Reduction (vph) | 0 | 54 | 1 | 0 | 0 | 0 |  |
| Lane Group Flow (vph) | 18 | 5 | 652 | 0 | 41 | 735 |  |
| Heavy Vehicles (\%) | 0\% | 0\% | 1\% | 0\% | 0\% | 1\% |  |
| Turn Type | Prot | Perm | NA |  | Perm | NA |  |
| Protected Phases | 4 |  | 2 |  |  | 2 |  |
| Permitted Phases |  | 4 |  |  | 2 |  |  |
| Actuated Green, G (s) | 3.2 | 3.2 | 27.9 |  | 27.9 | 27.9 |  |
| Effective Green, g (s) | 3.2 | 3.2 | 28.9 |  | 28.9 | 28.9 |  |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.72 |  | 0.72 | 0.72 |  |
| Clearance Time (s) | 4.0 | 4.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 3.0 | 3.0 | 5.2 |  | 5.2 | 5.2 |  |
| Lane Grp Cap (vph) | 132 | 118 | 1244 |  | 482 | 1248 |  |
| v/s Ratio Prot | c0.01 |  | 0.38 |  |  | c0.42 |  |
| v/s Ratio Perm |  | 0.00 |  |  | 0.06 |  |  |
| v/c Ratio | 0.14 | 0.04 | 0.52 |  | 0.09 | 0.59 |  |
| Uniform Delay, d1 | 17.2 | 17.0 | 2.5 |  | 1.7 | 2.7 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.5 | 0.1 | 0.8 |  | 0.2 | 1.2 |  |
| Delay (s) | 17.6 | 17.2 | 3.3 |  | 1.8 | 3.9 |  |
| Level of Service | B | B | A |  | A | A |  |
| Approach Delay (s) | 17.3 |  | 3.3 |  |  | 3.8 |  |
| Approach LOS | B |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 4.3 |  | HCM 2000 | evel of Service | A |
| HCM 2000 Volume to Capacity ratio |  |  | 0.54 |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 40.1 |  | Sum of los | me (s) | 8.0 |
| Intersection Capacity Utilization |  |  | 46.5\% |  | CU Level | Service | A |
| Analysis Period (min) |  |  | 15 |  |  |  |  |
| C Critical Lane Group |  |  |  |  |  |  |  |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 5.3 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | $\mathbf{F}$ |  |  | $\uparrow$ |
| Traffic Vol, veh/h | 40 | 125 | 185 | 30 | 175 | 200 |
| Future Vol, veh/h | 40 | 125 | 185 | 30 | 175 | 200 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 85 | 85 | 85 | 85 | 85 | 85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 47 | 147 | 218 | 35 | 206 | 235 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 883 | 236 | 0 | 0 | 253 | 0 |
| Stage 1 | 236 | - | - | - | - | - |
| Stage 2 | 647 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 319 | 808 | - | - | 1324 | - |
| Stage 1 | 808 | - | - | - | - | - |
| Stage 2 | 525 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 262 | 808 | - | - | 1324 | - |
| Mov Cap-2 Maneuver | 262 | - | - | - | - | - |
| Stage 1 | 663 | - | - | - | - | - |
| Stage 2 | 525 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 15.5 |  | 0 |  | 3.8 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRWBLn1 |  | SBL | SBT |
| Capacity (veh/h) |  | - | - | 537 | 1324 | - |
| HCM Lane V/C Ratio |  | - | - | 0.361 | 0.156 | - |
| HCM Control Delay (s) |  | - | - | 15.5 | 8.2 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 1.6 | 0.6 | - |


|  | 4 |  | 4 |  | $\ddagger$ | $\downarrow$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |  |
| Lane Configurations | * |  | ${ }^{7}$ | 44 | 中 ${ }^{\text {c }}$ |  |  |
| Traffic Volume (vph) | 15 | 155 | 90 | 1000 | 1120 | 35 |  |
| Future Volume (vph) | 15 | 155 | 90 | 1000 | 1120 | 35 |  |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |  |
| Total Lost time (s) | 4.0 |  | 4.0 | 4.5 | 4.5 |  |  |
| Lane Util. Factor | 1.00 |  | 1.00 | 0.95 | 0.95 |  |  |
| Frpb, ped/bikes | 1.00 |  | 1.00 | 1.00 | 1.00 |  |  |
| Flpb, ped/bikes | 1.00 |  | 1.00 | 1.00 | 1.00 |  |  |
| Frt | 0.88 |  | 1.00 | 1.00 | 1.00 |  |  |
| Flt Protected | 1.00 |  | 0.95 | 1.00 | 1.00 |  |  |
| Satd. Flow (prot) | 1514 |  | 1646 | 3260 | 3245 |  |  |
| Flt Permitted | 1.00 |  | 0.95 | 1.00 | 1.00 |  |  |
| Satd. Flow (perm) | 1514 |  | 1646 | 3260 | 3245 |  |  |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |  |
| Adj. Flow (vph) | 16 | 170 | 99 | 1099 | 1231 | 38 |  |
| RTOR Reduction (vph) | 150 | 0 | 0 | 0 | 2 | 0 |  |
| Lane Group Flow (vph) | 36 | 0 | 99 | 1099 | 1267 | 0 |  |
| Confl. Peds. (\#/hr) |  |  | 1 |  |  | 1 |  |
| Heavy Vehicles (\%) | 0\% | 1\% | 1\% | 2\% | 2\% | 0\% |  |
| Turn Type | Prot |  | Prot | NA | NA |  |  |
| Protected Phases | 8 |  | 1 | 6 | 2 |  |  |
| Permitted Phases |  |  |  |  |  |  |  |
| Actuated Green, G (s) | 6.9 |  | 7.5 | 46.2 | 34.2 |  |  |
| Effective Green, g (s) | 7.4 |  | 8.0 | 46.7 | 34.7 |  |  |
| Actuated g/C Ratio | 0.12 |  | 0.13 | 0.75 | 0.55 |  |  |
| Clearance Time (s) | 4.5 |  | 4.5 | 5.0 | 5.0 |  |  |
| Vehicle Extension (s) | 2.5 |  | 2.5 | 4.8 | 4.8 |  |  |
| Lane Grp Cap (vph) | 178 |  | 210 | 2431 | 1798 |  |  |
| v/s Ratio Prot | c0.02 |  | 0.06 | c0.34 | c0.39 |  |  |
| v/s Ratio Perm |  |  |  |  |  |  |  |
| v/c Ratio | 0.20 |  | 0.47 | 0.45 | 0.70 |  |  |
| Uniform Delay, d1 | 24.9 |  | 25.3 | 3.0 | 10.2 |  |  |
| Progression Factor | 1.00 |  | 1.00 | 1.00 | 1.00 |  |  |
| Incremental Delay, d2 | 0.4 |  | 1.2 | 0.3 | 1.5 |  |  |
| Delay (s) | 25.3 |  | 26.6 | 3.3 | 11.8 |  |  |
| Level of Service | C |  | C | A | B |  |  |
| Approach Delay (s) | 25.3 |  |  | 5.2 | 11.8 |  |  |
| Approach LOS | C |  |  | A | B |  |  |
| Intersection Summary |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 9.8 |  | HCM 2000 | evel of Service | A |
| HCM 2000 Volume to Capacity ratio |  |  | 0.60 |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 62.6 |  | Sum of los | me (s) | 12.5 |
| Intersection Capacity Utilization |  |  | 62.0\% |  | ICU Level of Service |  | B |
| Analysis Period (min) |  |  | 15 |  |  |  |  |

c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.6 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | $\mathbf{T}$ | A | $\mathbf{-}$ |  |  |
| Traffic Vol, veh/h | 0 | 45 | 450 | 195 | 0 | 0 |
| Future Vol, veh/h | 0 | 45 | 450 | 195 | 0 | 0 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 0 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 16974 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 2 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 51 | 511 | 222 | 0 | 0 |


| Major/Minor | Minor2 |  |  | Major2 |  |
| :--- | ---: | ---: | ---: | :--- | :---: |
| Conflicting Flow All | - | 222 | 0 | 0 |  |
| $\quad$ Stage 1 | - | - | - | - |  |
| $\quad$ Stage 2 | - | - | - | - |  |
| Critical Hdwy | - | 6.22 | 4.1 | - |  |
| Critical Hdwy Stg 1 | - | - | - | - |  |
| Critical Hdwy Stg 2 | - | - | - | - |  |
| Follow-up Hdwy | -3.318 | 2.2 | - |  |  |
| Pot Cap-1 Maneuver | 0 | 818 | - | - |  |
| $\quad$ Stage 1 | 0 | - | - | - |  |
| $\quad$ Stage 2 | 0 | - | - | - |  |
| Platoon blocked, \% |  |  |  | - |  |
| Mov Cap-1 Maneuver | 0 | 818 | - | - |  |
| Mov Cap-2 Maneuver | 0 | - | - | - |  |
| Stage 1 | 0 | - | - | - |  |
| Stage 2 | 0 | - | - | - |  |


|  | EB | WB |  |
| :--- | ---: | ---: | :--- |
| Approach |  |  |  |
| HCM Control Delay, s | 9.7 |  |  |
| HCM LOS | A |  |  |
|  |  |  |  |
| Minor Lane/Major Mvmt | EBLn1 | WBL | WBT |
| Capacity (veh/h) | 818 | - | - |
| HCM Lane V/C Ratio | 0.063 | - | - |
| HCM Control Delay (s) | 9.7 | - | - |
| HCM Lane LOS | A | - | - |
| HCM 95th \%tile Q(veh) | 0.2 | - | - |



C Critical Lane Group

c Critical Lane Group





| Intersection |  |
| :--- | ---: |
| Intersection Delay, s/veh | 8 |
| Intersection LOS | A |


| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Lane Configurations |  | $\uparrow$ | $\uparrow$ |  | Fr |  |
| Traffic Vol, veh/h | 65 | 10 | 20 | 120 | 50 | 105 |
| Future Vol, veh/h | 65 | 10 | 20 | 120 | 50 | 105 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 76 | 12 | 24 | 141 | 59 | 124 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 |
| Approach | EB |  | WB |  | SB |  |
| Opposing Approach | WB | EB |  |  |  |  |
| Opposing Lanes | 1 |  | 1 |  |  |  |
| Conflicting Approach Left SB |  |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  | 0 | 1 |  |  |
| Conflicting Approach Right |  | SB | EB |  |  |  |
| Conflicting Lanes Right | 0 | 1 | 1 |  |  |  |
| HCM Control Delay | 8.2 | 7.7 | 8.2 |  |  |  |


| Lane | EBLn1WBLn1 SBLn1 |  |  |
| :--- | ---: | ---: | ---: |
| Vol Left, \% | $87 \%$ | $0 \%$ | $32 \%$ |
| Vol Thru, \% | $13 \%$ | $14 \%$ | $0 \%$ |
| Vol Right, \% | $0 \%$ | $86 \%$ | $68 \%$ |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 75 | 140 | 155 |
| LT Vol | 65 | 0 | 50 |
| Through Vol | 10 | 20 | 0 |
| RT Vol | 0 | 120 | 105 |
| Lane Flow Rate | 88 | 165 | 182 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.114 | 0.178 | 0.208 |
| Departure Headway (Hd) | 4.632 | 3.884 | 4.098 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 776 | 926 | 877 |
| Service Time | 2.649 | 1.898 | 2.113 |
| HCM Lane V/C Ratio | 0.113 | 0.178 | 0.208 |
| HCM Control Delay | 8.2 | 7.7 | 8.2 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.6 | 0.8 |

Intersection
Intersection Delay, s/veh 7.5
Intersection LOS A

| Movement EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | * |  |  | * |  |  | 4 |  |  | \& |  |
| Traffic Vol, veh/h 1 | 1 | 1 | 5 | 5 | 55 | 1 | 2 | 5 | 90 | 5 | 1 |
| Future Vol, veh/h 1 | 1 | 1 | 5 | 5 | 55 | 1 | 2 | 5 | 90 | 5 | 1 |
| Peak Hour Factor 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow 1 | 1 | 1 | 6 | 6 | 65 | 1 | 2 | 6 | 106 | 6 | 1 |
| Number of Lanes 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach RighNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay 7.1 |  |  | 7 |  |  | 6.9 |  |  | 7.9 |  |  |
| HCM LOS A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $12 \%$ | $33 \%$ | $8 \%$ | $94 \%$ |
| Vol Thru, \% | $25 \%$ | $33 \%$ | $8 \%$ | $5 \%$ |
| Vol Right, \% | $62 \%$ | $33 \%$ | $85 \%$ | $1 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 8 | 3 | 65 | 96 |
| LT Vol | 1 | 1 | 5 | 90 |
| Through Vol | 2 | 1 | 5 | 5 |
| RT Vol | 5 | 1 | 55 | 1 |
| Lane Flow Rate | 9 | 4 | 76 | 113 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.01 | 0.004 | 0.077 | 0.133 |
| Departure Headway (Hd) | 3.775 | 4.037 | 3.621 | 4.227 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 942 | 875 | 977 | 849 |
| Service Time | 1.823 | 2.115 | 1.689 | 2.249 |
| HCM Lane V/C Ratio | 0.01 | 0.005 | 0.078 | 0.133 |
| HCM Control Delay | 6.9 | 7.1 | 7 | 7.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0 | 0.2 | 0.5 |


| Intersection |
| :--- |
| Intersection Delay, s/veh 7.5 |
| Intersection LOS A |


| Movement EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 4 |  |  | * |  |  | 4 |  |  | 4 |  |
| Traffic Vol, veh/h 5 | 10 | 5 | 1 | 10 | 5 | 15 | 45 | 5 | 5 | 80 | 10 |
| Future Vol, veh/h 5 | 10 | 5 | 1 | 10 | 5 | 15 | 45 | 5 | 5 | 80 | 10 |
| Peak Hour Factor 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| Mvmt Flow 6 | 12 | 6 | 1 | 12 | 6 | 18 | 53 | 6 | 6 | 94 | 12 |
| Number of Lanes 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach RighNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay 7.3 |  |  | 7.2 |  |  | 7.5 |  |  | 7.6 |  |  |
| HCM LOS A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $23 \%$ | $25 \%$ | $6 \%$ | $5 \%$ |
| Vol Thru, \% | $69 \%$ | $50 \%$ | $62 \%$ | $84 \%$ |
| Vol Right, \% | $8 \%$ | $25 \%$ | $31 \%$ | $11 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 65 | 20 | 16 | 95 |
| LT Vol | 15 | 5 | 1 | 5 |
| Through Vol | 45 | 10 | 10 | 80 |
| RT Vol | 5 | 5 | 5 | 10 |
| Lane Flow Rate | 76 | 24 | 19 | 112 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.086 | 0.027 | 0.021 | 0.124 |
| Departure Headway (Hd) | 4.058 | 4.138 | 4.066 | 3.979 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 879 | 853 | 867 | 899 |
| Service Time | 2.1 | 2.223 | 2.154 | 2.014 |
| HCM Lane V/C Ratio | 0.086 | 0.028 | 0.022 | 0.125 |
| HCM Control Delay | 7.5 | 7.3 | 7.2 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 0.1 | 0.1 | 0.4 |



C Critical Lane Group



c Critical Lane Group

|  | 4 |  |  | $\checkmark$ |  |  | 4 | $\uparrow$ | P |  | $\downarrow$ | $\checkmark$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\uparrow \uparrow$ |  |  | $\uparrow$ | F |  | $\uparrow \uparrow$ | F |  |  |  |
| Traffic Volume (vph) | 95 | 335 | 0 | 0 | 255 | 185 | 30 | 960 | 140 | 0 | 0 | 0 |
| Future Volume (vph) | 95 | 335 | 0 | 0 | 255 | 185 | 30 | 960 | 140 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) |  | 4.0 |  |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |  |  |
| Lane Util. Factor |  | 0.95 |  |  | 1.00 | 1.00 |  | 0.95 | 1.00 |  |  |  |
| Frpb, ped/bikes |  | 1.00 |  |  | 1.00 | 0.98 |  | 1.00 | 0.99 |  |  |  |
| Flpb, ped/bikes |  | 1.00 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Frt |  | 1.00 |  |  | 1.00 | 0.85 |  | 1.00 | 0.85 |  |  |  |
| Flt Protected |  | 0.99 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Satd. Flow (prot) |  | 3272 |  |  | 1750 | 1446 |  | 3220 | 1468 |  |  |  |
| Flt Permitted |  | 0.71 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Satd. Flow (perm) |  | 2361 |  |  | 1750 | 1446 |  | 3220 | 1468 |  |  |  |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 97 | 342 | 0 | 0 | 260 | 189 | 31 | 980 | 143 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 120 | 0 | 0 | 53 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 439 | 0 | 0 | 260 | 69 | 0 | 1011 | 90 | 0 | 0 | 0 |
| Confl. Peds. (\#/hr) | 6 |  | 10 | 10 |  | 6 | 5 |  | 1 | 1 |  | 5 |
| Heavy Vehicles (\%) | 2\% | 0\% | 0\% | 0\% | 0\% | 1\% | 6\% | 3\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | pm+pt | NA |  |  | NA | Perm | Perm | NA | Perm |  |  |  |
| Protected Phases | 3 | 8 |  |  | 4 |  |  | 6 |  |  |  |  |
| Permitted Phases | 8 |  |  |  |  | 4 | 6 |  | 6 |  |  |  |
| Actuated Green, G (s) |  | 17.2 |  |  | 17.2 | 17.2 |  | 42.8 | 42.8 |  |  |  |
| Effective Green, g (s) |  | 17.7 |  |  | 17.7 | 17.7 |  | 44.3 | 44.3 |  |  |  |
| Actuated g/C Ratio |  | 0.25 |  |  | 0.25 | 0.25 |  | 0.63 | 0.63 |  |  |  |
| Clearance Time (s) |  | 4.5 |  |  | 4.5 | 4.5 |  | 5.5 | 5.5 |  |  |  |
| Vehicle Extension (s) |  | 2.5 |  |  | 2.5 | 2.5 |  | 5.0 | 5.0 |  |  |  |
| Lane Grp Cap (vph) |  | 596 |  |  | 442 | 365 |  | 2037 | 929 |  |  |  |
| v/s Ratio Prot |  |  |  |  | 0.15 |  |  |  |  |  |  |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Perm |  | c0. 19 |  |  |  | 0.05 |  | 0.31 | 0.06 |  |  |  |
| v/c Ratio |  | 0.74 |  |  | 0.59 | 0.19 |  | 0.50 | 0.10 |  |  |  |
| Uniform Delay, d1 |  | 24.0 |  |  | 23.0 | 20.5 |  | 6.9 | 5.0 |  |  |  |
| Progression Factor |  | 1.29 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Incremental Delay, d2 |  | 4.4 |  |  | 1.7 | 0.2 |  | 0.9 | 0.2 |  |  |  |
| Delay (s) |  | 35.4 |  |  | 24.6 | 20.7 |  | 7.7 | 5.2 |  |  |  |
| Level of Service |  | D |  |  | C | C |  | A | A |  |  |  |
| Approach Delay (s) |  | 35.4 |  |  | 23.0 |  |  | 7.4 |  |  | 0.0 |  |
| Approach LOS |  | D |  |  | C |  |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 16.9 |  | HCM 2000 | Level of S | ervice |  | B |  |  |  |
| HCM 2000 Volume to Capacity ratio |  |  | 0.61 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 70.0 |  | Sum of los | time (s) |  |  | 12.5 |  |  |  |
| Intersection Capacity Utilization |  |  | 72.7\% |  | CU Level | f Service |  |  | C |  |  |  |
| Analysis Period (min) |  |  | 15 |  |  |  |  |  |  |  |  |  |
| c Critical Lane Group |  |  |  |  |  |  |  |  |  |  |  |  |

c Critical Lane Group



| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 9.8 |  |  |  |  |  |  |  |  |  |  |  |
| Movement E | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\uparrow$ |  |  | $\uparrow$ |  | ${ }^{*}$ |  |  |  | $\uparrow$ |  |
| Traffic Vol, veh/h | 0 | 20 | 45 | 185 | 15 | 0 | 70 | 0 | 260 | 0 | 0 | 0 |
| Future Vol, veh/h | 0 | 20 | 45 | 185 | 15 | 0 | 70 | 0 | 260 | 0 | 0 | 0 |
| Conflicting Peds, \#/hr | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control Stop | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | Free | - | - | None |
| Storage Length | - | - | - | - | - | - | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 16974 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 93 | 93 | 93 | 93 | 92 | 93 | 92 | 93 | 92 | 92 | 92 |
| Heavy Vehicles, \% | 2 | 0 | 0 | 0 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 48 | 199 | 16 | 0 | 75 | 0 | 280 | 0 | 0 | 0 |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 125 | 0 | - | 0 | 432 | 122 |
| Stage 1 | - | - | - | - | 122 | - |
| Stage 2 | - | - | - | - | 310 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.21 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.309 |
| Pot Cap-1 Maneuver | 1474 | - | - | - | 584 | 932 |
| Stage 1 | - | - | - | - | 908 | - |
| Stage 2 | - | - | - | - | 748 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1474 | - | - | - | 568 | 932 |
| Mov Cap-2 Maneuver | - | - | - | - | 568 | - |
| Stage 1 | - | - | - | - | 883 | - |
| Stage 2 | - | - | - | - | 748 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 1.2 |  | 0 |  | 9.5 |  |
| HCM LOS |  |  |  |  | A |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT | WBT | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1474 | - | - | - | 894 |
| HCM Lane V/C Ratio |  | 0.028 | - | - | - | 0.1 |
| HCM Control Delay (s) |  | 7.5 | - | - | - | 9.5 |
| HCM Lane LOS |  | A | - | - | - | A |
| HCM 95th \%tile Q(veh) |  | 0.1 | - | - | - | 0.3 |

## Appendix E <br> Crash Data and Calculations

## Oregon Department of Transportation

Region

## 2016 - On-State, Top 10\% SPIS Groups - By Hwy, MP

| Rte | Rdwy | BMP | EMP Length | ADT | Crash | Fatal | A | B | C | PDO | City | County | Connection |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 231 | Elkton-Sutherlin |  |  |  |  |  |  |  |  |  | Percent | SPIS |  |  |
| OR-138 | 1 | 13.65 | 13.79 | 0.14 | 1,800 | 7 | 0 | 1 | 2 | 1 | 3 |  | Douglas | TYEE RD. |


| 240 Cape Arago |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OR-540 | 1 | 0.07 | 0.25 | 0.18 | 16,000 | 19 | 1 | 1 | 3 | 6 | 8 | North Bend | Coos | MCPHERSON AVE. | 95 | 66.28 |
| OR-540 | 1 | 1.69 | 1.87 | 0.18 | 18,300 | 35 | 0 | 3 | 0 | 12 | 20 | North Bend | Coos | HWY. 240(BROADWAY <br> ST.) M.P. (2)1.70 | 95 | 78.51 |

## 241 Coos River

| OR-241 | 1 | 0.09 | 0.19 | 0.10 | 9,033 | 13 | 0 | 1 | 2 | 2 | 8 | Coos | ELLEN ST. |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |


|  | 1 | -7.21 | -7.07 | 0.14 | 5,700 | 6 | 0 | 2 | 1 | 1 | 2 | Jackson |  | 90 | 54.79 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | -0.59 | -0.41 | 0.18 | 4,600 | 6 | 0 | 2 | 1 | 1 | 2 | Jackson | ANTELOPE RD. | 90 | 58.69 |
| OR-140 | 1 | 0.94 | 1.12 | 0.18 | 5,800 | 6 | 0 | 2 | 2 | 0 | 2 | Jackson | LAKEVIEW DR. | 90 | 54.69 |
| OR-140 | 1 | 2.20 | 2.38 | 0.18 | 5,900 | 9 | 0 | 4 | 0 | 1 | 4 | Jackson | KERSHAW RD. | 95 | 72.07 |
| OR-140 | 1 | 3.50 | 3.59 | 0.09 | 5,900 | 9 | 0 | 1 | 2 | 6 | 0 | Jackson | RILEY RD. | 90 | 51.96 |


| 271 Sams Valley |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OR-234 | 1 | 10.57 | 10.77 | 0.20 | 2,811 | 4 | 0 | 2 | 1 | 0 | 1 | Jackson | LEG (TO TABLE ROCK RD.) | 90 | 54.01 |
| OR-234 | 1 | 12.52 | 12.68 | 0.16 | 2,500 | 9 | 0 | 1 | 2 | 3 | 3 | Jackson | ANTIOCH RD. | 90 | 54.48 |
| OR-234 | 1 | 14.57 | 14.73 | 0.16 | 2,500 | 6 | 0 | 1 | 2 | 2 | 1 | Jackson | MODOC RD. | 90 | 47.15 |


| 272 Jacksonville |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OR-238 | 1 | 0.04 | 0.21 | 0.17 | 23,800 | 44 | 0 | 0 | 10 | 17 | 17 | Grants Pass | Josephine | HWY. 272 M.P. 0.19 | 95 | 74.47 |
| OR-238 | 1 | 0.15 | 0.36 | 0.21 | 19,022 | 37 | 0 | 2 | 7 | 17 | 11 | Grants Pass | Josephine | HWY. 272 M.P. 0.19 | 95 | 79.92 |
| OR-238 | 1 | 34.78 | 34.96 | 0.18 | 8,366 | 16 | 0 | 3 | 4 | 4 | 5 |  | Jackson | LEG (TO W MAIN ST.) | 95 | 79.39 |

## 482 Redwood Spur

| US-199 | 1 | -0.11 | 0.07 | 0.18 | 26,700 | 29 | 1 | 0 | 4 | 14 | 10 | Grants Pass | Josephine | PARKDALE DR. |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| US-199 | 1 | 0.78 | 0.96 | 0.18 | 23,000 | 39 | 0 | 1 | 5 | 17 | 16 | Grants Pass | Josephine | F ST. |

[^41]
## Oregon Department of Transportation

Region

## 2016 - On-State, Top 10\% SPIS Groups - By Hwy, MP

| Rte | Rdwy | BMP | EMP | Length | ADT | Crash | Fatal | A | B | C | PDO | City | County | Connection | Percent | SPIS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 001 Pacific |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I-5 | 1 | 3.91 | 4.02 | 0.11 | 14,600 | 6 | 1 | 1 | 2 | 0 | 2 |  | Jackson |  | 90 | 50.53 |
| I-5 | 1 | 5.41 | 5.55 | 0.14 | 15,000 | 14 | 1 | 1 | 4 | 1 | 7 |  | Jackson |  | 95 | 62.82 |
| I-5 | 1 | 6.93 | 7.06 | 0.13 | 15,000 | 16 | 0 | 1 | 2 | 3 | 10 |  | Jackson |  | 90 | 48.96 |
| I-5 | 1 | 30.23 | 30.34 | 0.11 | 42,555 | 6 | 0 | 2 | 0 | 1 | 3 | Medford | Jackson |  | 90 | 46.74 |
| I-5 | 1 | 30.27 | 30.38 | 0.11 | 37,711 | 6 | 0 | 2 | 0 | 1 | 3 | Medford | Jackson |  | 90 | 46.88 |
| I-5 | 1 | 39.93 | 40.09 | 0.16 | 35,900 | 14 | 0 | 1 | 3 | 4 | 6 |  | Jackson |  | 90 | 46.49 |
| I-5 | 1 | 68.06 | 68.19 | 0.13 | 19,300 | 15 | 0 | 1 | 3 | 2 | 9 |  | Josephine |  | 90 | 46.77 |
| I-5 | 1 | 107.92 | 108.09 | 0.17 | 26,300 | 12 | 0 | 4 | 0 | 3 | 5 |  | Douglas |  | 95 | 65.53 |
|  | 1 | 120.36 | 120.48 | 0.12 | 40,200 | 5 | 1 | 2 | 0 | 2 | 0 |  | Douglas | $\begin{aligned} & \text { 001XE CONN. M.P. } \\ & \text { 2C120.51 } \end{aligned}$ | 95 | 60.23 |
| I-5 | 1 | 123.90 | 124.06 | 0.16 | 41,400 | 16 | 1 | 0 | 4 | 5 | 6 |  | Douglas |  | 90 | 50.42 |
| I-5 | 1 | 124.98 | 125.11 | 0.13 | 47,800 | 13 | 1 | 1 | 1 | 6 | 4 | Roseburg | Douglas |  | 95 | 61.58 |

## 009 Oregon Coast

| US-101 | 1 | 235.31 | 235.49 | 0.18 | 9,900 | 43 | 0 | 0 | 5 | 13 | 25 | North Bend | Coos | CALIFORNIA AVE. | 95 | 71.78 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| US-101 | 1 | 236.41 | 236.59 | 0.18 | 20,600 | 32 | 0 | 1 | 9 | 6 | 16 | North Bend | Coos | NEWMARK ST. | 95 | 72.09 |
| US-101 | 1 | 238.98 | 239.09 | 0.11 | 17,511 | 6 | 1 | 1 | 0 | 1 | 3 | Coos Bay | Coos | HWY. 009 M.P. <br> (2)239.08 | 90 | 48.94 |
| US-101 | 1 | 239.28 | 239.47 | 0.19 | 26,300 | 26 | 0 | 2 | 5 | 6 | 13 |  | Coos | HARRIET RD. | 95 | 72.90 |
| US-101 | 1 | 317.41 | 317.55 | 0.14 | 2,300 | 3 | 0 | 2 | 0 | 0 | 1 |  | Curry |  | 90 | 49.84 |
| US-101 | 1 | 356.83 | 357.01 | 0.18 | 17,000 | 21 | 0 | 1 | 3 | 8 | 9 | Brookings | Curry | 5TH ST. | 90 | 54.92 |

## 021 Green Springs

| OR-66 | 1 | 0.91 | 1.08 | 0.17 | 10,233 | 20 | 0 | 1 | 1 | 8 | 10 | Ashland | Jackson | YMCA WAY |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## 022 Crater Lake

| OR-62 | 1 | 0.05 | 0.14 | 0.09 | 31,800 | 29 | 0 | 1 | 6 | 12 | 10 | Medford | Jackson |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| OR-62 | 1 | 0.36 | 0.65 | 0.29 | 37,800 | 74 | 0 | 2 | 8 | 29 | 35 | Medford | Jackson | HWY. 022 M.P. 0.36 | 95 | 77.42 |

[^42]|  | Segment Begin Location |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rd Name | Rd No. | MP | Ref. Location Desc. | Dist. \Dir. * | Direcction from <br> Begin to <br> End ** | City | Intersection | ADT | Crash | Fatal | A | B | C | PDO | Percent | SPIS |
| Ingersoll St |  |  | S 2ND ST | $106 \backslash 92$ | 270 | Coos Bay |  | 1,100 | 5 | 0 | 1 | 1 | 2 | 1 | 90 | 50.47 |
| Ingersoll St |  |  | S 2ND ST | 53 \94 | 270 | Coos Bay |  | 1,100 | 5 | 0 | 1 | 1 | 2 | 1 | 90 | 50.47 |
| Ingersoll St |  |  | S 2ND ST | 010 | 270 | Coos Bay |  | 1,100 | 5 | 0 | 1 | 1 | 2 | 1 | 90 | 50.47 |


| Newmark St | NEWMARK ST | 1532 \90 | 270 | North Bend | 13,800 | 11 | 0 | 1 | 3 | 4 | 3 | 90 | 47.79 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Newmark St | NEWMARK ST | 1479 \90 | 270 | North Bend | 13,800 | 11 | 0 | 1 | 3 | 4 | 3 | 90 | 47.79 |
| Newmark St | NEWMARK ST | $1426 \backslash 90$ | 270 | North Bend | 13,800 | 11 | 0 | 1 | 3 | 4 | 3 | 90 | 47.79 |
| Newmark St | NEWMARK ST | 1373 \90 | 270 | North Bend | 13,800 | 11 | 0 | 1 | 3 | 4 | 3 | 90 | 47.79 |
| Newmark St | NEWMARK ST | $1320 \backslash 90$ | 270 | North Bend | 13,800 | 11 | 0 | 1 | 3 | 4 | 3 | 90 | 47.79 |
| S 10th St | COMMERCIAL AVE | $476 \backslash 180$ | 0 | Coos Bay | 5,000 | 11 | 0 | 1 | 2 | 4 | 4 | 90 | 52.96 |
| S 10th St | COMMERCIAL AVE | $423 \backslash 180$ | 0 | Coos Bay | 5,000 | 11 | 0 | 1 | 2 | 4 | 4 | 90 | 52.96 |
| S 10th St | COMMERCIAL AVE | $370 \backslash 180$ | 0 | Coos Bay | 5,000 | 11 | 0 | 1 | 2 | 4 | 4 | 90 | 52.96 |
| Sherman Ave | EXCHANGE ST | $106 \backslash 180$ | 0 | North Bend | 9,688 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 47.10 |
| Sherman Ave | EXCHANGE ST | $53 \backslash 180$ | 0 | North Bend | 8,777 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 47.69 |
| Sherman Ave | EXCHANGE ST | 010 | 0 | North Bend | 7,866 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 48.38 |
| Sherman Ave | COMMERCIAL ST | $528 \backslash 181$ | 0 | North Bend | 6,955 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 49.20 |
| Sherman Ave | COMMERCIAL ST | $476 \backslash 181$ | 1 | North Bend | 6,044 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 50.18 |
| Sherman Ave | COMMERCIAL ST | $423 \backslash 181$ | 1 | North Bend | 5,133 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 51.40 |
| Sherman Ave | COMMERCIAL ST | $370 \backslash 181$ | 1 | North Bend | 4,222 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 52.96 |
| Sherman Ave | COMMERCIAL ST | $317 \backslash 181$ | 1 | North Bend | 3,311 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 55.03 |
| Sherman Ave | COMMERCIAL ST | $264 \backslash 181$ | 1 | North Bend | 2,400 | 10 | 0 | 1 | 1 | 5 | 3 | 90 | 57.99 |

Notes:

* Distance in feet and Direction in degrees (0-359) from the referecence location to the segment begin point. Distance is measured along the road. Direction is measured straight line, aka 'as the crow flies'.
** Direction in degrees (0-359) from the segment begin point to the segment end point. Direction is measured straight line, aka 'as the crow flies'.
*** All segments are 0.10 mile in length.





## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#7:
Future Deficiencies and Needs

## TECHNICAL MEMORANDUM \#7

## Future Deficiencies and Needs (Task 6.5)

Date: January 18, 2019

To: City of Coos Bay<br>City of North Bend<br>Oregon Department of Transportation, Region 3

From: Angela Rogge, PE, Sepehr Dastgheibi, EIT, and Dana Shuff, EIT, David Evans and Associates, Inc.
Brooke Jordan and Drew DeVitis, Jacobs
Shayna Rehberg, Angelo Planning Group
Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
This memorandum presents an evaluation of how the Cities of Coos Bay and North Bend's transportation system operates in 2040. The analysis combines information from previous technical memoranda with information about planned transportation improvements and anticipated growth in population and employment. The deficiencies and needs identified for each mode consider the goals and objectives established for the TSP. The intent is a connected, multimodal transportation network that provides a safe, equitable, efficient and resilient system for residents and visitors.

## Why 2040?

Oregon Administration Rule (OAR) 660-012-0030(3)(a) indicates that future transportation needs shall be based on population and employment forecasts and distributions shall be consistent with the acknowledged comprehensive plan and must be at least 20 years from the date the TSP is adopted.

For the North Bend and Coos Bay area, the analysis assumes a forecast year of 2040 to account for the time needed to conduct the analysis and adopt the updated TSPs. This will ensure that the plan horizon (forecast year) for the TSP is at least 20 years from the point of adoption.

## Coos Bay/North Bend Travel Demand Model

The Coos Bay/North Bend Travel Demand Model is used to predict future vehicular traffic volumes and understand where change in population and employment is expected. As the population grows or development occurs, new or updated infrastructure may be needed.

Travel demand models are tools used to help predict the patterns of future commuters, school traffic, and recreational traffic. The model relies on socioeconomic data (e.g., households and employment) to determine the travel demand, and system attributes (e.g., roadway capacity, speeds, and distances) to represent the transportation supply. The long-range regional growth forecasts are consistent with current land use zoning and State-approved population forecasts for the Bay Area. The detailed model assumptions are described in detail in a memorandum developed by TPAU (see appendix).

## Future Population

The amount of people living and working in the Bay Area impact the future of the transportation system. The assumptions made about land use also have an impact on transportation. For example, retail land uses generate more trips than residential. Balancing the locations of different land use types can reduce the need for residents to travel long distances, thus reducing stress on the transportation network.

Projected population is one of the primary tools for developing planning policies as well as determining the need for future urban growth boundary expansions. The Portland State University Population Research Center (PRC) provides population projections for up to 50 years into the future. ${ }^{1}$ PRC bases its population forecasts on historic and current trends, as well as assumptions about the likelihood of future events. Historically, Oregon law required counties to prepare coordinated population forecasts. In recent years, responsibility for coordinated population forecasting has been assigned to the PRC.

According to projections, North Bend's total population is expected to grow at a slightly faster pace than Coos Bay's total population during the TSP's 20-year planning horizon (Table 1). However, Coos Bay's total population is greater overall. Both cities' growth rates through 2040 are significantly higher than Coos County's growth rate and their combined projected growth ( 1,676 people) is projected to be more than the County's growth during that period.

Table 1. Projected Population in Coos Bay, North Bend, and Coos County

| Location | 2017 | 2040 | Share of <br> County 2017 | Share of <br> County 2040 | Growth | Annual <br> Growth Rate |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| North Bend | 9,800 | 10,450 | $15 \%$ | $16 \%$ | 650 | $0.29 \%$ |
| Coos Bay | 16,615 | 17,641 | $26 \%$ | $28 \%$ | 1,026 | $0.27 \%$ |
| Coos County | 63,310 | 64,148 | $100 \%$ | $100 \%$ | 838 | $0.06 \%$ |

Source: Portland State University Population Research Center Coordinated Population Forecast: 2015 through 2065 for Coos County Urban Growth Boundaries (UGB) and Area Outside UGBs (June 2015) and Certified 2017 Population Estimates (June 2017)

[^43]
## Future Pedestrian, Bicycle and Transit Needs

The following sections will evaluate the future deficiencies and needs of the pedestrian, bicycle and transit systems.

## Pedestrian

The existing pedestrian network in North Bend and Coos Bay includes sidewalks, shared-use paths, boardwalks and trails. The 2004 Coos Bay and North Bend TSP updates identified a need to expand the City's system of pedestrian facilities, with the objective of sidewalks or pathways for pedestrians on all collector and arterial streets (Pedestrian Action Plan).

The identification of future pedestrian needs considers connectivity to key community destinations and activity centers, along with current Pedestrian Level of Traffic Stress analysis and historical crash patterns. Table 2 and Table 3 identify deficiencies and needs for pedestrian facilities in North Bend and Coos Bay, respectively (also shown in Figure 1). Priority categorization refers to facilities that provide access to key community destinations, such as safe routes to schools, libraries, and commercial activity centers and those that complete the existing bicycle network. These facilities may be reasonably funded within a 20 -year implementation period for the TSP Update.

Secondary categorization refers to facilities that provide less direct access to key community destinations and/or provide routes where there is a gap in coverage. These facilities are important to include in any screening and analysis of alternative, but may not be reasonably funded within the TSP 20-year implementation period.

One way to prioritize pedestrian needs is to focus on multimodal connectivity. The sections below review areas where improved or new crossings could have greater benefit to pedestrians due to proximity to key community features and access to transit service.

## North Bend

Since 2004 TSP, the following projects have been completed:

- Sidewalk on Virginia Avenue, from Cedar Court to Maple Street and from Arthur Street to Hayes Street
- Sidewalk on Newmark Avenue, from Broadway Avenue to the west City Limits

There are currently no funded pedestrian projects planned City facilities in North Bend for the planning horizon, however ODOT facilities are planned to have ADA improvements (US 101 and OR 241). The table below summarizes areas to focus future pedestrian improvements.

Table 2. North Bend Pedestrian (Sidewalk) Deficiencies and Needs

| Facility Name | Priority ${ }^{\mathbf{1}}$ |
| :--- | :---: |
| Colorado Ave (one side) | Arthur St to Oak St |
| Oak St | Newmark St to 17th St |
| $17^{\text {th } \text { St }}$ | W. City Limits to Broadway St |
| Arthur St | Connecticut Ave to Colorado Ave |
| Connecticut Ave | Meade Ave to McPherson |


| Facility Name | Approximate Location |
| :--- | :---: |
| Pony Creek Rd/Brussels St (one side) | Virginia Ave to Newmark St |
| Crowell Ln (one side) | Pony Creek Rd to Pacific Ave |
| Pacific Ave (one side) | Crowell Ln to 16th St |
| Newmark St (one side) | Broadway St to Sherman Ave |
| Newmark St | Sherman Ave to US 101 |

Notes: ${ }^{1}$ Provide access to key community destinations; ${ }^{2}$ Fills gap in access

## Pedestrian Crossings

In North Bend, the locations near community features and transit stops and how enhanced or new pedestrian crossings and sidewalks could improve them are listed below.

- North Bend Senior Activity Center: Marked crossing of Colorado Avenue and sidewalks from transit stop to Activity Center.
- Boynton Park: Marked crossing of Sherman Avenue at Exchange Street transit stop.
- Airport Heights Market: Marked crossings of all four legs of the intersection of Virginia Avenue at Lincoln Street.


## Coos Bay

Since 2004 TSP, the following projects have been completed:

- Sidewalk on Central Avenue and Ocean Boulevard, from 7th Street to Woodland Drive
- Sidewalk on Bayshore Street, from Elrod Avenue to Market Avenue
- Sidewalk on N. Empire Boulevard, from Newmark Street to Wisconsin Avenue
- Sidewalk on Broadway Street, from downtown to north City Limits
- Sidewalk on Golden Avenue, from 4th Street to 7th Street

The City of Coos Bay recently received Safe Routes to School funding to provide sidewalk, ramps, crosswalk, rapid flashing beacon and bikes lanes for Millicoma and Eastside Elementary Schools. All ODOT facilities are planned to have ADA improvements (US 101 and OR 241). The table below summarizes areas to focus future pedestrian improvements.

Table 3. Coos Bay Pedestrian (Sidewalk) Deficiencies and Needs

| Facility Name | Approximate Location |  |
| :--- | :--- | :--- |
|  | Priority ${ }^{\mathbf{1}}$ |  |
| Southwest Blvd |  | Libby Dr to Montana Ave |


| Facility Name | Approximate Location |
| :---: | :---: |
| Shoneman-Morrison St | Harris Ave to Lakeshore Dr |
| Morrison St | Pacific Ave to Newmark Ave |
| Pacific Ave (one side) | Wasson St to Fillmore St |
| Pacific Ave | Fillmore St to Morrison St |
| $17^{\text {th }}$ St | East City Limits to Grant St |
| Koosbay Blvd | 10th St to 8th St |
| $10^{\text {th }} \mathrm{St}$ (one side) | Teakwood Ave to Hemlock Ave |
| Koosbay Blvd (one side) | North City Limits to Vine St |
| Coos River Hwy | "H" St to Applewood |
| $7{ }^{\text {th }} \mathrm{St}$ | Hall Ave to Ingersoll Ave |
| $7{ }^{\text {th }} \mathrm{St}$ | Johnson Ave to Lockhart Ave |
| $11^{\text {th }}$ St | S. of Ferguson Ave to Ingersoll Ave |
| Lockhart Ave | 10th St to 4th St |
| Ingersoll Ave (one side) | 10th St to 7th St |
| $5^{\text {th }} \mathrm{St}$ | Johnson Ave to Lockhart Ave |
| Coos River Hwy/Newport Lane | US 101 to Chamberlain Rd |
| Coos River Hwy | Isthmus Slough to "I" St |
| Secondary ${ }^{2}$ |  |
| Woodland Ave | North City Limits to Thompson Road |
| Woodland Ave | Thompson Rd to Ocean Blvd |
| $4^{\text {th }}$ St | Commercial Ave to Curtis Ave |
| $2^{\text {nd }} \mathrm{St}$ | Anderson Ave to Golden Ave |
| Lockhart Ave | 4th St to Front St |
| Front St | Lockhart Ave to US 101 |
| $4^{\text {th }} \mathrm{St}$ | Kruse Ave to Lockhart |
| Ingersoll Ave | 2nd St to Broadway Dr/US 101 S |
| Wallace St | Ocean Blvd to Newmark Ave |
| US 101 (one side) | North City Limits to downtown |
| US 101 (North, one side) | Commercial Ave to Golden Ave |

Notes: ${ }^{1}$ Provide access to key community destinations; ${ }^{2}$ Fills gap in access

## Pedestrian Crossings

In Coos Bay, the locations near community features and transit stops and how enhanced or new pedestrian crossings and sidewalks could improve them are listed below.

- Devereaux Center: Marked crossing of Ocean Boulevard and/or realign existing crossing of Newmark Avenue to shorten walking distance.
- Three Rivers Casino: Marked crossing of Ocean Boulevard at Wallace Street.
- Bay Area Hospital: Marked crossing of Thompson Road to access hospital transit stop.
- Medical Center (Immediate Care Clinic): Marked crossing of Woodland Drive near Hospital Way. Add sidewalks on Woodland and Hospital Way.


| Libraries | Pedestrian Action Plan Route |
| :--- | :--- |
| Sospitals | Priority |
| Schools | Secondary |

Figure 1. Pedestrian Deficiencies and Needs

## Bicycle

The existing bicycle transportation network in North Bend and Coos Bay includes few dedicated bicycle facilities. Bicycle signage and markings are minimal throughout most parts of the City, and part of the existing Oregon Coast Bike Route requires bicyclists and vehicular traffic to mix on arterial and collector roadways.

The 2004 Coos Bay and North Bend TSP updates identified a designated bicycle network for arterial and collector roadways and distinguished between a Bicycle Action Plan (short to medium term with some financially constrained funding priorities) and a Bicycle Master Plan (long-term unfunded priorities). The bicycle deficiencies and needs described in this section draw from the 2004 TSP, as well as other sources. Table 4 and Table 5 summarize on-street bicycle deficiencies and needs for North Bend and Coos Bay, respectively. Bicycle deficiencies and needs are also displayed in Figure 2.

## North Bend

Since the 2004 TSP, the City of North Bend has implemented a bicycle lane on the Broadway/Newmark Curve as of this writing.

Identified deficiencies and needs analysis for on-street bicycle facilities in North Bend draws on the Bicycle Action Plan and Bicycle Master Plan from the 2004 TSP. The identification of future bicycle facility deficiencies and needs also accounts for connectivity to key community destinations and activity centers, along with current Bicycle Level of Traffic Stress analysis and historical bicycle crash patterns to account for safety priorities. In addition, consideration was given to the feasibility of implementing facilities within existing public right-of-way based on existing roadway standards.

Table 4 identifies deficiencies and needs for bicycle facilities in North Bend. Priority categorization refers to facilities that provide access to key community destinations, such as safe routes to schools, libraries, and commercial activity centers and those that complete the existing bicycle network. These facilities may be reasonably funded within a 20-year implementation period for the TSP Update.

Secondary categorization refers to facilities that provide less direct access to key community destinations and/or provide north-south and east-west routes where there is a gap in coverage. These facilities are important to include in any screening and analysis of alternatives, but it is possible that they may not be reasonably funded within the TSP 20-year implementation period.

Table 4. North Bend Bicycle Deficiencies and Needs

| Facility Name | Approximate Location |
| :---: | :---: |
| US 101 | Northern City Limits to Southern City Limits |
| Virginia Ave | Ocean Blvd to Empire Ave |
| Broadway Ave | US 101 to 7 ${ }^{\text {th }}$ St |
| Newmark Ave | US 101 to $5^{\text {th }}$ St; $7^{\text {th }}$ St to Ocean Blvd |
| Sherman Ave | US 101 to 7 $7^{\text {th }}$ St |
| $7^{\text {th }}$ St | Commercial Ave to Lockhart Ave |
| $16^{\text {th }}$ St | Broadway Ave to ESt |
|  | Secondary ${ }^{\mathbf{2}}$ |


| Facility Name | Approximate Location |
| :---: | :---: |
| Pony Creek Rd | Newmark Ave to Virginia Ave |
| Virginia Ave | Broadway Ave to City Limits |
| Broadway Ave | Newmark Ave to City Limits |
| Lakeshore Dr | Fir St to City Limits |
| $17^{\text {th }}$ St | Fir St to Broadway Ave |
| Coos River Rd | $10^{\text {th }}$ Ave to eastern City Limits |

Notes: ${ }^{1}$ Provide access to key community destinations; ${ }^{2}$ Fills gap in access

## Coos Bay

Since the 2004 TSP, the City of Coos Bay has implemented the following facilities:

- Bicycle lanes on N. Empire Boulevard from Newmark Avenue to Wisconsin Avenue
- Bicycle lanes on Central Avenue/Ocean Blvd from N $12^{\text {th }}$ Street to $\mathrm{N} 19^{\text {th }}$ Street
- Bicycle lanes on Ocean Boulevard from Merrill Street to Newmark Avenue
- Bicycle lanes on Newmark Avenue from 660 feet east of LaClair Street west to Ocean Boulevard Future deficiencies and needs analysis for on-street bicycle facilities in Coos Bay draws on the Bicycle Action Plan and Bicycle Master Plan from the 2004 TSP. In addition, the identification of future bicycle facility deficiencies and needs accounts for connectivity to key community destinations and activity centers, along with current Bicycle Level of Traffic Stress analysis and historical bicycle crash patterns to account for safety priorities. In addition, consideration was given to the feasibility of implementing facilities within existing public right-of-way based on existing roadway standards.

Table 5 identifies deficiencies and needs for bicycle facilities in Coos Bay. Priority categorization refers to facilities that provide access to key community destinations, such as safe routes to schools, libraries, and commercial activity centers and those that complete the existing bicycle network. These facilities may be reasonably funded within a 20-year implementation period and represent deficiencies that should be addressed in the short- to medium-term.

Secondary categorization refers to facilities that provide less direct access to key community destinations and/or provide north-south and east-west routes where there is a gap in coverage. These facilities are important to include in any evaluation of alternatives, but it is likely that they may not be reasonably funded within the TSP 20-year implementation period. Accordingly, these represent deficiencies that should be addressed in the long term.

Table 5. Coos Bay Bicycle Deficiencies and Needs

| Facility Name | Approximate Location |
| :---: | :---: |
| Priority ${ }^{\mathbf{1}}$ |  |
| US 101 | Northern City Limits to Southern City Limits |
| Newmark St | Ocean Blvd to Empire Ave |
| Commercial Ave | US 101 to $7^{\text {th }}$ St |
| Central Ave | US 101 to $5^{\text {th }}$ St; $7^{\text {th }}$ St to Ocean Blvd |
| Anderson Ave | US 101 to $7^{\text {th }}$ St |


| Facility Name | Approximate Location |
| :---: | :---: |
| $7^{\text {th }} \mathrm{St}$ | Commercial Ave to Lockhart Ave |
| $10^{\text {th }} \mathrm{St}$ | Commercial Ave to south of Ferguson Ave |
| Southwest Blvd | Lockhart Ave to City Limits |
| Ocean Blvd | Laclair St to Woodland Dr |
| Morrison St | Pacific Ave to Newmark Ave |
| Pacific Ave | Empire Blvd to Morrison St |
| Secondary ${ }^{2}$ |  |
| $4^{\text {th }}$ St | Commercial Ave to Lockhart Ave |
| Newport Ln | US 101 to $6^{\text {th }}$ Ave |
| $6^{\text {th }}$ Ave | US 101/Newport Ln to D St |
| D St | $2^{\text {nd }}$ Ave to $6^{\text {th }}$ Ave |
| Coos River Rd | $10^{\text {th }}$ Ave to eastern City Limits |
| Woodland Dr | Ocean Blvd to City Limits |
| Lakeshore Dr | Taylor Ave to City Limits |
| Wasson St | Taylor Ave to Newmark Ave |

Notes: ${ }^{1}$ Provide access to key community destinations; ${ }^{2}$ Fills gap in access

## Oregon Coast Bike Route

The deficiencies and needs analysis also highlights the Oregon Coast Bike Route (OCBR), which runs through North Bend and Coos Bay. ODOT is currently undertaking a 2 to 3 year planning effort to develop the OCBR Plan that will identify future investments that ODOT or local jurisdictions might make to improve the safety, accessibility, and enjoyment of the facility for tourists and community members alike. The OCBR serves community destinations along the Oregon Coast, while helping generate more than $\$ 56$ million in annual spending from coastal bicycle tourism.

$\square$ Hospitals
2. LibrariesSchools
Mixed Use and Central Commercial
Parks and Public Areas

Bicycle Network
Deficiencies and Needs
Existing Facilities
$\longrightarrow$ Priority Facilities
—econdary Facilities
Existing Oregon Coast Bike Route


Data Sources:
Cities of North Bend and Coos Bay, Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Transit

Coos County Area Transit (CCAT) provides a fair level transit service within North Bend and Coos Bay, operating two Bay Area Loop routes and two connectors to communities north and south of the cities in Coos County. The connecting routes serve the Coquille Indian Tribe, along with the communities of Myrtle Point, Powers, Hauser, and Lakeside. Additional transportation providers, such as Curry Public Transit, Pacific Crest Bus Lines, and Greyhound operate intercity connections to destinations such as Eugene, Bandon, Port Orford, and Brookings. More complete information on intra- and intercity transit services available in North Bend and Coos Bay is documented in Technical Memorandum \#4.

As a whole, the existing services provide a fair level of transit service to the cities, but there are specific opportunities for improvement. While projected growth in the Cities over the next 20 years is forecasted to be minimal, transit deficiencies and needs are focused on enhancing existing service coverage and frequency, ensuring transit accessibility, and continuing coordination between CCAT and intercity transportation providers as their services evolve. The table below highlights key deficiencies and needs for the CCAT system, which are referenced by a route, if applicable, and a specific category of need.

Table 6. Coos County Area Transit Deficiencies and Needs

| Route | Category of <br> Need |  |
| :---: | :---: | :--- |
| Bay Area <br> Loop | Service <br> Frequency | Add weekend service on Saturday and Sunday as funding allows for <br> East and West loop routes. |
| Bay Area <br> Loop | Service <br> Frequency | Provide earlier morning and/or later evening service for East and <br> West Loop routes. Past community outreach from Coordinated <br> Human Services Plan identified this as a need for service sector <br> employees, in particular, such as people with jobs at the The Mill <br> and Three Rivers Casinos, Pony Village Mall, etc. |
| Bay Area <br> Loop | Service <br> Coverage | Add an express Bay Area Loop to serve heavily-trafficked areas in <br> North Bend and Coos Bay. |
| Bay Area | Service <br> Loop | Expand service coverage to areas not adequately served by transit <br> within the cities, such as the Southwest Oregon Regional Airport. |
| Coquille- <br> Myrtle Point | Service <br> Frequency | Consider restoring twice-weekly fixed route service from North <br> Bend and Coos Bay to Coquille and Myrtle Point. |
| Lakeside- | Service <br> Hauser <br> Coverage | Consider re-establishing service to Winchester Bay and Reedsport <br> in Douglass County via Lakeside/Hauser. |
| N/A | Service <br> Coverage | Consider developing intercity service that connects to Eugene <br> through Florence via US 101 and OR-126. |
| N/A | Service <br> Frequency | Consider supplementing existing transit service between Curry <br> County, Bandon, and North Bend/Coos Bay, which are currently <br> served by the Coastal Express route operated by Curry Public |
| Transit. |  |  |


| Route | Category of <br> Need | Service <br> Frequency |
| :---: | :---: | :--- |
| N/A | Consider expanding dial-a-ride/demand response service to provide <br> transportation options for seniors and mobility-limited residents to <br> medical appointments and key community destinations. |  |
| N/A | Inter-Agency <br> Coordination | Coordinate with Curry Public Transit, Pacific Crest, and other inter- <br> city transportation providers to ensure ongoing alignment with <br> CCAT schedules and stop locations in North Bend and Coos Bay. |
| N/A | Inter-Agency <br> Crioritize development of a central transit hub to provide easy <br> Connections between intra- and intercity public transit service. |  |
| N/A | Accessibility | Partner with the Confederated Tribes of the Coos, Lower Umpqua, <br> and Siuslaw to pursue funding opportunities for enhancing transit <br> service and transit amenities in the greater Coos Bay area. |
| N/A | Accessibility providing additional transit shelters at stops with higher |  |
| ridership and near key community destinations. |  |  |
| Work with the Cities of North Bend and Coos Bay to guide strategic |  |  |
| investments for improving access to bus stops, with a focus on |  |  |
| pedestrian crossings at higher ridership stops. |  |  |$|$| Accessibility |
| :--- | | Partner with the Cities of North Bend and Coos Bay to enhance bus |
| :--- |
| stops and bus pullouts within the public right-of-way. |

## Future Traffic (Street and Highway System)

This section will review the process for developing forecast peak hour motor vehicle volumes and how traffic conditions are expected to change in the future.

## Volume Development

Future baseline traffic volume forecasts for year 2040 were developed using the 2013 and 2035 Coos Bay/North Bend travel demand forecasting models in combination with the 2017 existing traffic data. The planning horizon for the TSP extends to 2040; thus, year 2035 model volumes were extrapolated to 2040. The long-range regional travel forecasts are consistent with current land use zoning and funded transportation projects within the North Bend and Coos Bay UGBs.

## Future Roadway Network

The network used in the forecasts for the Bay Area is a future network that includes roadway projects and safety improvements that are expected to occur by year 2040 on study area roadways. These projects have known funding sources or are programmed to be funded within the next 20 years:

- US 101: Bunker Hill sidewalks \& Flanagan signal (Coos Bay) - 2018-2021 STIP, Key \#19243 Upgrade sidewalks on US 101 between Flanagan Road and M.P. 240.10. Replace the signal hardware at the intersection of US 101 at Flanagan Road. Replace the illumination between Flanagan Rd \& Edwards Rd.
- OR 540: Broadway at Newmark realign (North Bend) - 2018-2021 STIP, Key \#20219

Upgrade signal poles and hardware; convert the 4-Lane roadway to 3-lane roadway with center turn lane. At this time, the recommended improvements include dual eastbound left-turn lanes, bicycle lanes, pedestrian safety and restrict the driveway on the south side of Newmark to right-in/right-out.

- US 101: Johnson Ave. Intersections (Coos Bay) - 2018-2021 STIP, Key \#20246

Improve signal phasing and coordination on US 101/Johnson Avenue (NB and SB intersections)
The cities have identified additional pavement maintenance projects as part of their capital plans. These planned projects do not influence traffic operational analysis, but will be considered during the solutions development phase of the TSP update.

## Operational Criteria

The mobility performance targets are discussed in Technical Memorandum \#5. V/C and LOS thresholds are the key technical and policy benchmarks for measuring street/vehicle performance, used to help identify future improvements and to manage growth.

Volume-to-Capacity (V/C) Ratio: A comparison of traffic volume to intersection capacity. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays.

Level of Service (LOS): Level of service is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a STOPcontrolled intersection, the $\mathrm{v} / \mathrm{c}$ ratio might indicate that there is adequate capacity to process the demand for that movement. Similarly, at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

## Future Driving Conditions

The Bay Area is expected to see a steady, albeit minor, growth in population and employment within the 2040 planning horizon. This increase could result in an increase in traffic along the arterial street system, and minor increases on the local and neighborhood network. Due to its geographic location, visitors to North Bend and Coos Bay must do so by crossing bridges. These bridges, specifically the Conde McCullough Memorial Bridge and the Isthmus Slough Bridge, are existing bottlenecks in the traffic that travels to and from the Bay Area that are expected to increase by 2040.

## Future Volumes

The Bay Area traffic trends fluctuate throughout the year due to coastal and recreational opportunities in the area. Volumes for the summer (peak) conditions were developed and analyzed to determine where future transportation investments may be needed to accommodate future growth. Figure 3 and Figure 4 report a summary of the anticipated future (year 2040) vehicular turning movement volumes and intersection configurations.

In North Bend, most of the volume growth are along the following routes: US 101, Virginia Avenue and Newmark Avenue (east of Broadway Avenue).

In Coos Bay, the volume growth is along the following routes: US 101, Ocean Boulevard, and Lockart Avenue/Southwest Boulevard.

## Operational Results

Table 7 and Table 8 report a summary of the anticipated future (year 2040) vehicular traffic operational results for each analysis intersection. If a value is shaded in black, the intersection exceeds applicable mobility targets and is flagged as a future need to address during alternatives development.

Analysis for the PM peak period shows that only two of the study area intersections are expected to exceed applicable mobility thresholds, one in North Bend and one in Coos Bay.




| Newmark Ave at Brusells St |  |  |
| :---: | :---: | :---: |
| 24 |  |  |
|  | $\stackrel{\text { ¢0¢ }}{\substack{\text { ¢ }}}$ |  |
| ${ }_{5}^{805} \underset{5}{8} \underset{\sim}{\text { A }}$ |  |  |
| TEV $=1545$ |  |  |

## Legend



Allowable Movement
TEV Total Entering Volume
Signalized Intersection
STOP Controlled Approach

Figure 3
Future Baseline (2040)
PM Peak Hour (4:30-5:30 PM)
Turn Movement Volumes
North Bend


## Legend

$\vec{\imath}$ Allowable Movement

## , 䉼: Signalized Intersection

Figure 4
Future Baseline (2040)
PM Peak Hour (4:30-5:30 PM)
Turn Movement Volumes
Coos Bay

## North Bend

Table 7 summarizes the traffic operations for North Bend. The intersection of US 101 at Newmark Street exceeds the mobility target with a V/C of 0.81 which is just over the ODOT threshold. In addition, the intersection of Broadway Street at Newmark Avenue approaches the ODOT mobility target.
Coincidentally, these two intersections are the highest volume intersections in the city. Both of these intersections are signalized.

The intersection of Virginia Avenue at Meade Avenue experiences a high volume of cut-through traffic for those avoiding travelling through the Virginia Avenue at US 101 intersections. The operations are within the mobility targets; however, the high volume of eastbound left-turning vehicles could impact operations on Virginia Avenue in the future.

Table 7. Future (2040) PM Peak Hour Traffic Operations - North Bend

| ID | Intersection Name | Critical Movement ${ }^{1}$ | v/C ${ }^{2}$ | LOS $^{2}$ | Mobility Target ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Arthur St at Colorado Lp | NBLR | 0.01 | A | LOS D |
| 2 | Oak St/W Airport Way at Colorado Ave/Maple Leaf | NBLTR | 0.01 | B | LOS D |
| 3 | Maple Leaf at E Airport Way | SBLR | 0.02 | B | LOS D |
| 4 | US 101 at Florida Ave | Overall | 0.67 | B | 0.85 |
| 5 | Virginia Ave at Arthur St | SBLR | 0.01 | B | LOS D |
| 6 | Virginia Ave at Oak St | SBLTR | 0.09 | C | LOS D |
| 7 | Virginia Ave at Maple St | SBLR | 0.31 | B | LOS D |
| 8 | Virginia Ave at Broadway St | Overall | 0.72 | C | 0.95 |
| 9 | Virginia Ave at Pony Village Main Driveway | Overall | 0.51 | B | 0.95 |
| 10 | Virginia Ave at Harrison Ave | Overall | 0.48 | B | 0.95 |
| 11 | Virginia Ave at Meade Ave | EBTL | 0.38 | B | 0.95 |
|  |  | SBLTR | 0.42 | D | 0.95 |
| 12 | Virginia Ave at US 101 South | Overall | 0.55 | B | 0.85 |
| 13 | Virginia Ave at US 101 North | Overall | 0.46 | A | 0.85 |
| 14 | Marion Ave at Safeway Driveway | WBLR | 0.20 | B | LOS D |
| 15 | Washington Ave at US 101 South/Sherman Ave | SBL | 0.01 | A | 0.85 |
|  |  | EBTR | 0.03 | B | 0.95 |
| 16 | Pony Creek Rd at Crowell Ln | EBLR | 0.11 | B | LOS D |
| 17 | Oak St at 16th/17th St | NBLTR | 0.15 | A | LOS D |
| 18 | Broadway St at 16th St | Overall | 0.48 | A | 0.95 |
| 19 | Broadway Ave at 17th St | NBL | 0.09 | B | 0.95 |
|  |  | EBLTR | 0.21 | D | 0.95 |
| 20 | US 101 at Mill Casino Entrance | Overall | 0.54 | A | 0.80 |


| ID | Intersection Name | Critical Movement ${ }^{1}$ | V/C ${ }^{2}$ | LOS ${ }^{2}$ | Mobility Target ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 21 | Newmark Ave at Oak St | Overall | 0.55 | A | LOS D |
| 22 | Broadway St at Newmark Ave | Overall | 0.89 | E | 0.95 |
| 23 | Newmark St at Edgewood Dr | NBLR | 0.19 | C | LOS D |
| 24 | Newmark Ave at Brusells St | Overall | 0.41 | A | LOS D |
| 25 | Newmark St at Sherman Ave | Overall | 0.70 | C | LOS D |
| 26 | US 101 at Newmark St | Overall | 0.81 | C | 0.80 |

Shaded cells exceed the mobility target.
Acronyms: $\mathrm{EB}=$ eastbound; $\mathrm{WB}=$ westbound; $\mathrm{NB}=$ northbound; and $\mathrm{SB}=$ southbound. $\mathrm{L}=$ left; $\mathrm{T}=$ through; and $\mathrm{R}=$ right. Notes:

1. At intersections, the results are reported for the worst operating movements on major and minor approaches that must stop or yield the right of travel to other traffic flows. For signalized intersections, the overall operations are reported.
2. The $\mathrm{v} / \mathrm{c}$ ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which does not account for the influence of adjacent intersection operations.
3. Mobility target is reported for the critical movement; Unsignalized intersections may have two different mobility targets for the major and minor approaches (Action 1F.1, Oregon Highway Plan, 1999)

## Coos Bay

Table 8 summarizes the traffic operations for Coos Bay. The intersection of Newmark Avenue and Morrison Street exceeds the mobility target. This intersection is a two-way stop-controlled intersection. Although failing southbound direction does not receive a high demand volume, due to high volumes of traffic traveling on Newmark Street, southbound turning vehicles experience excessive delay.

There are a few other locations nearing the mobility target: $7^{\text {th }}$ Street at Anderson Avenue, Johnson Avenue at US 101 South, and Johnson Ave at US 101 North. The intersection of $7^{\text {th }}$ Street at Anderson Avenue is stop-controlled intersection with free flowing traffic on Anderson Avenue that side street traffic must wait for. Johnson Avenue at US 101 South is a five-legged intersection and Johnson Avenue at US 101 North is its northbound couplet. These two intersections are major busy intersections in Coos Bay. It should be noted that while the intersection of Hall Avenue at US 101 North has a V/C under the mobility target, the eastbound direction experiences excessive delay and has a level of service of F .

Table 8. Future (2040) PM Peak Hour Traffic Operations - Coos Bay

| ID | Intersection Name | Critical <br> Movement ${ }^{1}$ | V/C $^{2}$ | LOS $^{2}$ | Mobility <br> Target $^{3}$ |
| :--- | :--- | :---: | :---: | :---: | :---: |
| 27 | Morrison St at Lakeshore Dr | EBLR | 0.14 | A | LOS D |
| 28 | Newmark Ave at Cape Arago Hwy/Empire Blvd | 0.04 | C | LOS D |  |
| 29 | Newmark Ave at Morrison St | SBLTR | 0.13 | F | LOS D |
| 30 | Newmark Ave at Ocean Blvd | Overall | 0.57 | A | LOS D |
| 31 | Newmark Ave at Laclair St | Overall | 0.30 | A | LOS D |
| 32 | Empire Blvd at Pacific Ave | WBLR | 0.15 | C | LOS D |
| 33 | Thompson Rd at Woodland Dr | WBL | 0.17 | C | LOS D |


| ID | Intersection Name | Critical Movement ${ }^{1}$ | V/C ${ }^{2}$ | LOS ${ }^{2}$ | Mobility Target ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 34 | Koosbay Blvd at Thompson Rd | EBLR | 0.50 | C | LOS D |
| 35 | Ocean Blvd at Woodland Dr | Overall | 0.58 | B | LOS D |
|  | Ocean Blvd at Butler Rd | Overall | 0.56 | A | LOS D |
| 37 | Koosbay Blvd at 10th St | WBLR | 0.38 | C | LOS D |
| 38 | Us 101 at Koosbay Blvd | Overall | 0.67 | B | 0.80 |
| 39 | 7th St at Commercial Ave | EBR | 0.06 | A | LOS D |
| 40 | Commercial Ave at US 101 South | Overall | 0.61 | B | 0.85 |
| 41 | Commercial Ave at US 101 North | -- | -- | -- | 0.85 |
| 42 | 10th St at Central Ave | Overall | 0.66 | B | LOS D |
| 43 | Central Ave at 7th St | WBL | 0.01 | A | LOS D |
| 44 | 7th St at Anderson Ave | NBLR | 0.43 | D | LOS D |
| 45 | Elrod Ave at 10th St | WBTR | 0.24 | A | LOS D |
| 46 | 11th St at Ingersoll Ave | SBLTR | 0.14 | A | LOS D |
| 47 | 7th St at Ingersoll Ave | NBLTR | 0.12 | A | LOS D |
| 48 | Hall Ave at US 101 South | Overall | 0.56 | B | 0.85 |
| 49 | Hall Ave at US 101 North | NBL | 0.05 | A | 0.85 |
|  |  | EBLT | 0.50 | F | 0.95 |
|  | Johnson Ave at US 101 South | Overall | 0.75 | B | 0.85 |
| 51 | Johnson Ave at US 101 North | Overall | 0.75 | B | 0.85 |
| 52 | 7th St at Lockhart Ave/Southwest Blvd | SBLR | 0.12 | B | LOS D |
| 53 | 6th Ave at D St / Coos River Hwy | WBLTR | 0.24 | B | LOS D |
|  | Coos River Rd at Ross Inlet Rd | SBLR | 0.10 | A | LOS D |

Shaded cells exceed the mobility target.
Acronyms: $E B=$ eastbound; $\mathrm{WB}=$ westbound; $\mathrm{NB}=$ northbound; and $\mathrm{SB}=$ southbound. $\mathrm{L}=$ left; $\mathrm{T}=$ through; and $\mathrm{R}=$ right. Notes:

1. At intersections, the results are reported for the worst operating movements on major and minor approaches that must stop or yield the right of travel to other traffic flows. For signalized intersections, the overall operations are reported.
2. The $\mathrm{v} / \mathrm{c}$ ratios and LOS are based on the results of the macrosimulation analysis using Synchro, which does not account for the influence of adjacent intersection operations.
3. Mobility target is reported for the critical movement; Unsignalized intersections may have two different mobility targets for the major and minor approaches (Action 1F.1, Oregon Highway Plan, 1999)

## Preliminary Signal Warrant Analysis

Preliminary signal warrant analysis was completed at the one unsignalized intersection in the study area expected to exceed operational targets by 2040. The intersection of Newmark Avenue at Morrison Street did not meet ODOT's preliminary signal warrants. A detailed worksheet is available in the appendix.

## Freight Conditions

There are no planned and funded projects expected to influence freight travel through North Bend and Coos Bay. Freight travel through the Bay Area is not forecast to be significantly impacted by future growth, as the overall level of motor vehicle congestion is expected to remain within mobility targets for most intersections.

The Oregon Freight Plan (OFP) defines a statewide strategic freight network. The following facilities in the study area are considered part of the Western Corridor Strategic Corridor in the OFP: the Port of Coos Bay, US 101, Coos Bay Rail Line, and the Southwest Oregon Regional Airport. The roads connecting and serving these areas (intermodal connector roads) should maintain accessibility for future freight. The intermodal connector needs identified in the OFP are listed below:

- North Bend:
- California Avenue between Sherman Avenue, US 101 and the Dock Facility: Poor pavement condition (2015 data), improved safety at rail crossing, improved turning movements for one-way portion, improved pedestrian facilities.
- Sheridan Avenue between US 101 Port Facility: Poor pavement condition (2015 data), wider roadway, improved safety at rail crossing, improved turning movements for oneway portion, improved pedestrian facilities.
- Maple Leaf/Maple Street between Airport Way and Virginia Avenue: Pavement condition, safety, striping, freight mixing with bike traffic.
- US 101 mile point (M.P.) 236.28 - Lewis Street/Mill Casino signal head: Vertical clearance
- Coos Bay:
- US 101 M.P. 238.4-Curtis Avenue signal head: Vertical clearance


## Future Air, Rail, Pipeline and Marine

## Air

The Southwest Oregon Regional Airport (OTH) Master Plan projects that the growth of the airport expects to remain about the same, with the possibility of a $20 \%$ increase in based aircraft and about 30\% increase in passenger enplanements by 2030 (from 2010).

There is no public mass transit available at the airport. Capacity of all the off-airport access roads is considered adequate throughout the 20-year planning period. The on-airport general public access roads (East Airport Way and West Airport Way off Maple Leaf Lane, two-lane interior streets) are currently adequate to serve demand. The plan anticipates that, as new development occurs in the nonaviation area, it may be necessary to modify these access roads to accommodate new tenants and their specific needs.

## Rail

As of November 1, 2018, Coos Bay Rail Line, Inc. (CBRL) began train operations on the Port of Coos Bay (Port) owned rail line. Since the 2004 TSP, rail infrastructure investments have been made and there are several rehabilitation projects currently underway along the line. In 2011, service was restored to 111miles of the line from the North Spit to Eugene, and in 2013, the Port restored service to the entire 134-
mile line. ${ }^{2}$ The OFP identifies needs as improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels to create or improve multi-modal business opportunities.

As documented in Technical Memorandum \#6, no crashes or other incidents have occurred at the atgrade rail crossings within the UGBs. Once the swing span bridge is upgraded, rail operations through the cities is expected to be one through train to the south and one through train north between Monday and Friday, with additional activity at the Coos Bay and North Bend switchyards for staging. ${ }^{3}$ Should rail traffic increase within North Bend and Coos Bay, the Cities may choose to work with the Port to identify at-grade crossing improvements to enhance safety and reduce barriers to multimodal connectivity.

A couple locations should be given priority for improving multimodal connectivity and safety if an increase in rail traffic occurs. In North Bend, these locations are the at-grade crossings on Sheridan Avenue accessing the Simpson Heights neighborhood and on California Avenue and Virginia Avenue accessing the North Bend Boardwalk. In Coos Bay, the locations are the at-grade rail crossings accessing the Coos History Museum and Maritime Collection (Front Street) and the Coos Bay Boardwalk (near Anderson Avenue and Market Avenue).

No additional rail needs were identified for the future forecast year 2040.

## Pipeline

There have not been any significant changes to the pipeline system since the 2004 TSP updates and there are no changes to the pipeline system planned within North Bend or Coos Bay at this time. North of the study area, a liquefied natural gas (LNG) terminal is proposed on the North Spit, across the bay from OTH. Should the LNG terminal be constructed, infrastructure impacts are expected to be mitigated by the developer.

## Marine

The Port of Coos Bay has completed several projects since the completion of the 2004 TSP updates. The projects range from updating a master plan for the Charleston Marina (2007) to installing a new travel lift in the shipyard (2017). The projects are intended to spur economic development in both marine commerce and tourism.

There is currently a project in design and engineering that will expand the existing channel depth and width in order to facilitate future economic development and accommodate the growing global fleet. ${ }^{4}$

The OFP identifies the following needs related to the marine system:

- Charleston boatyard (dock, travel lift etc.) improvements that include the Marine Ways
- Oregon Gateway: North Spit improvements (ocean outfall, access roads etc.) to accommodate a multi-modal marine facility to handle bulk cargo, containers and an LNG export facility
- Federal channel widening and deepening to accommodate larger ships and ensure safer operations.
- Charleston dock replacements.

[^44]
## Community Feedback

In addition to the inventory and analysis of the modal systems, the TSP project team solicited feedback from our Public Advisory Committee (PAC). In the future, the following priorities were identified for the various modal systems:

Bicycle/Pedestrian:

- Refine the existing 2004 Pedestrian and Bicycle Action Plans to a targeted, prioritized list. (Woodland D, $6^{\text {th }}$ St/D St/ Coos River Hwy, Morrison St, Schoneman Ave, Devereux Center, Newmark Ave/Ocean Blvd, Sherman Ave)
- Develop a Safe Routes to School project list within a schools 1-mile radius.
- Provide parallel facilities to Virginia Avenue (North Bend)

Transit:

- Recognizing that CCAT would take the lead on implementation and funding, note desire for a regional transit hub, accessible transit and transit pull outs

Vehicular:

- Fix and maintain the existing system (pavement condition)
- Strengthen our existing system (resiliency/emergency preparedness)
- Provide a traffic calming "toolbox" for the Cities to offer potential neighborhood treatments
- Capture all needs, even if they are unlikely to be funded (bridges/structures)
- Confirm roadway classification against traffic volumes and proposed land use


## Summary of Future Deficiencies and Needs

During the planning horizon, the Bay area will see a gradual increase in population and pockets of development/redevelopment. Although an increase in traffic volumes is expected to be minor, for smaller communities such as North Bend and Coos Bay, minor increases can seem like a lot on roads that do not normally experience a lot of traffic.

The future conditions analysis identifies a need for targeted improvements that provide the most benefit for the cost.

Table 9 summarizes deficiencies expected to occur within the 2040 planning horizon. To provide a comprehensive picture of the anticipated deficiencies, the table also includes needs previously identified in Technical Memorandum \#4 (System Inventory) and Technical Memorandum \#6 (Current System Conditions), including intersections with high crash rates that have been flagged as priorities for safety reasons.

Table 9. Summary of Coos Bay and North Bend Transportation System Deficiencies and Needs

| Deficiency/Need |  |  |
| :---: | :---: | :---: |
| Mode | North Bend | Coos Bay |
| Pedestrian | Refine and prioritize Pedestrian Action Plan to address gaps in access to schools and community features (i.e. Sheridan Ave, $16^{\text {th }}$ Oak St, Pacific St ) | Refine and prioritize Pedestrian Action Plan to address gaps in access to schools and community features (i.e. Woodland Dr, $6^{\text {th }} \mathrm{St} / \mathrm{D}$ St/ Coos River Hwy, Morrison St, Schoneman Ave, Devereux Center, Newmark Ave/Ocean Blvd, Sherman Ave, Mingus Park) |
| Pedestrian | Improve areas identified with Pedestrian Level of Traffic Stress 4: Virginia Avenue, Newmark Avenue | Improve areas identified with Pedestrian Level of Traffic Stress 4: Newmark Avenue, Ocean Boulevard |
| Pedestrian | Construct lacking connections of trails or shared-use paths system between neighborhoods and commercial areas. | Construct lacking connections of trails or shared-use paths system between neighborhoods and commercial areas. |
| Pedestrian | Improve/Add marked crossings to improve access to transit stops at key locations: North Bend Senior Center, Boynton Park, Airport Heights Market | Improve/Add marked crossings to improve access to transit stops at key locations: Devereaux Center, Medical Center, Bay Area Hospital, Three Rivers Casino |
| Pedestrian | Develop a Safe Routes to School project list | Develop a Safe Routes to School project list |
| Pedestrian | Develop a parallel facility to Virginia Ave |  |
| Bicycle | Continue constructing bike facilities identified in Bicycle Action Plan (Refine and prioritize Pedestrian Action Plan to address gaps in access to schools and community features) | Continue constructing bike facilities identified in Bicycle Action Plan (Refine and prioritize Pedestrian Action Plan to address gaps in access to schools and community features) |
| Bicycle | Add to and improve existing bicycle wayfinding and formalized markings | Add to and improve existing bicycle wayfinding and formalized markings |
| Bicycle | Improve areas identified with Bicycle Level of Traffic Stress 4: Cape Arago Highway, Newmark Ave/St, US 101 | Improve areas identified with Bicycle Level of Traffic Stress 4: Ocean Blvd, US 101 |
| Bicycle | Coordinate with and connect to Oregon Coast Bike Route | Coordinate with and connect to Oregon Coast Bike Route |
| Transit | Increase service frequency: <br> - Add weekend service on the Bay Area Loop <br> - Extend service hours <br> - Decrease headways and add additional route along US 101 and Sherman Ave | Increase service frequency: <br> - Add weekend service on the Bay Area Loop <br> - Extend service hours <br> - Decrease headways and add additional route along US 101 and Ocean Blvd |
| Transit | Improve accessibility: | Improve accessibility: |


| Mode | North Bend |  |
| :--- | :--- | :--- |\(\left.\quad \begin{array}{l}- Add shelters and stops near <br>

community destinations <br>
- Improve bicycle and pedestrian <br>
connectivity to stops\end{array} \quad $$
\begin{array}{l}\text { - Add shelters and stops near } \\
\text { community destinations } \\
\text { - Improve bicycle and pedestrian } \\
\text { connectivity to stops }\end{array}
$$\right\}\)

| Deficiency/Need |  |  |
| :---: | :---: | :---: |
| Mode | North Bend | Coos Bay |
|  | improve safety, add striping, separate freight and bike traffic |  |
| Freight | Make modifications at US 101/Florida Ave to accommodate high heavy vehicle volumes | Make modifications at US 101/Koosbay Blvd, US 101 South/Commercial Ave and US 101 North/Johnson Ave to accommodate high heavy vehicle volumes |
| Air | Add direct commercial passenger service between OTH and northwest hubs (Portland) | Add direct commercial passenger service between OTH and northwest hubs (Portland) |
| Air | Provide transit service to airport if air passenger service increases | Provide transit service to airport if air passenger service increases |
| Air | Make improvements to Airport Way and Maple Leaf Lane if warranted by future development |  |
| Rail | Make improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels as identified in the OFP to create or improve multimodal business opportunities | Make improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels as identified in the OFP to create or improve multimodal business opportunities |
| Rail |  | Install warning device: Market Ave at Front St and US 101 at US PlywoodCentral Dock Rd |
| Rail | Construct at-grade multimodal improvements: <br> - Sheridan Ave accessing the Simpson Heights neighborhood <br> - California Ave and Virginia Ave accessing the North Bend Boardwalk | Construct at-grade multimodal improvements: <br> - Access to Coos History Museum and Maritime Collection (Front St) <br> - Coos Bay Boardwalk (near Anderson Ave and Market Ave) |
| Marine | The OFP identifies the following needs <br> - Charleston boatyard (dock, travel lif Marine Ways <br> - Oregon Gateway: North Spit improv to accommodate a multi-modal ma containers and an LNG export facility <br> - Federal channel widening and deep ensure safer operations. <br> - Charleston dock replacements. | related to the marine system: etc.) improvements that include the <br> ments (ocean outfall, access roads etc.) ine facility to handle bulk cargo, <br> ening to accommodate larger ships and |
| Safety | Crash history (2012-2016) documented fatalities occurring at: <br> - Virginia Ave at Meade Ave <br> - Newmark Ave at Oak St <br> - US 101 at Florida Ave | Crash history (2012-2016) documented fatalities occurring at: <br> - US 101 South, south of Johnson Ave <br> - Ocean Blvd at 19th St |


|  | Deficiency/Need |  |
| :---: | :---: | :---: |
| Mode | North Bend | Coos Bay |
| Safety | Intersections flagged for exceeding critical and/or $90^{\text {th }}$ percentile crash rates: <br> - Virginia Ave at US 101 South <br> - Washington Ave at US 101 South/Sherman Ave <br> - Pony Creek Rd at Crowell Ln <br> - Broadway St at Newmark Ave <br> - US 101 at Newmark St | Intersections flagged for exceeding critical and/or $90^{\text {th }}$ percentile crash rates: <br> - Thompson Ave at Woodland Dr <br> - Koosbay Blvd at $10^{\text {th }}$ St <br> - $7^{\text {th }}$ St at Ingersoll Ave <br> - Johnson Ave at US 101 North <br> - $6^{\text {th }}$ Ave at D St/Coos River Hwy |
| Safety | Top 10\% Safety Priority Index System sites: <br> - US 101 near California Ave <br> - US 101 near Newmark St <br> - OR 540 near McPherson Ave <br> - OR 540 near State St <br> - Sherman Ave near Commercial St/Exchange St <br> - Newmark St near Brussels St | Top 10\% Safety Priority Index System sites: <br> - US 101 near Kruse Ave <br> - S 10th St near Commercial Ave <br> - Ingersoll St near S 2nd St |
| Safety | Newmark St at Sherman Ave and Newmark Ave at Broadway St suffer from two specific crash types with a probability of more than 90 percent |  |

Notes: TM \#4 = Technical Memorandum \#4 (System Inventory); TM \#6 = Technical Memorandum \#6 (Current System Conditions); TM \#7 = Technical Memorandum \#7 (Future Deficiencies and Needs)

## Next Steps

The next steps to drafting North Bend and Coos Bay's TSP Updates will work to develop concepts that consider the TSP goals and objectives, address identified deficiencies and align with each City's funding forecast.

# TECHNICAL MEMORANDUM \#7 APPENDIX 

Future Deficiencies and Needs (Task 6.5)

Appendix A Updated Coos Bay/North Bend Travel Demand Forecasting Model Memorandum (ODOT TPAU)

Appendix B STIP Projects
Appendix C Volume Development
Appendix D Synchro Worksheets
Appendix E Preliminary Signal Warrant Analysis

Updated Coos Bay/North Bend Travel Demand Forecasting Model Memorandum (ODOT TPAU)

To: Jim Hossley, Public Works Director, City of Coos Bay
Jill Rolfe, Planning Director, Coos County Planning Department
David K. Voss, AICP, City Planner, City of North Bend
Derek Windham, PLS, EIT, Engineering Coordinator, City of North Bend
Alexandra Coates, ODOT Region 3 Planner
From: Jin Ren, P.E., Senior Transportation Modeler/Analyst
Peter Schuytema, P.E., Senior Transportation Analyst
ODOT Transportation Planning Analysis Unit (TPAU)

## RE: Updated Coos Bay/North Bend Travel Demand Forecasting Model

The purpose of this memorandum is to summarize the process used to create the updated Coos Bay/North Bend 2013 travel demand model and the 2035 future year scenario. The model is now ready for application for the current City of North Bend Transportation and Growth Management (TGM) grant and for any other transportation or land use planning application.

## Brief Project Description

The City of North Bend was awarded a Transportation and Growth Management (TGM) grant for the North Point Industrial Lands: Multimodal Master Plan. This master plan would determine the most efficient way to integrate land use, multimodal transportation, and utility improvements at the 50-acre North Point Workforce Housing Project industrial site, a large-scale temporary workforce housing development for the Jordan Cove Energy Project after the lands are vacated. The master plan will prepare the City of North Bend for designing, engineering, and constructing any additional needed improvements to promote the site when the land reverts to primarily industrial use.

The purpose of the model development project was to forecast traffic growth from existing conditions to the new future 20-year (2035) horizon. The original Coos Bay/North Bend OSUM (Oregon Small Urban Model) had a Year 2000 base year and Year 2020 future year scenario. The Coos Bay/North Bend OSUM were used for the local Transportation System Plans (TSP) in the early 2000s. However, the model was outdated for this TGM planning study as it is only appropriate to extrapolate future volumes no more than five years beyond the horizon year. The resulting 10-year gap required an updated base year (2013) and a future scenario (2035).

## Model Outreach for Local Land Use \& Network Assumptions

TPAU and ODOT Region 3 staff conducted two outreach workshops at the City of Coos Bay City Hall. The attendances included staff from the local jurisdictions: Coos Bay Public Works Director, Coos County Planning Director, North Bend City Planner and the Engineering Coordinator. There were several objectives for the model outreach effort:
(1) Introduce travel demand forecasting model concepts, processes and applications;
(2) Review and update the current transportation network and land use in the existing model;
(3) Assist the local partners to make informed decisions on future land use and network assumptions;
(4) Have the model better reflect the existing on-the-ground conditions; and
(5) Obtain the consistencies and reasonableness on the future short and long range land use and transportation plans.

The first outreach workshop was held on November 5, 2014. The first half of the four-hour workshop TPAU staff presented and answered questions on travel demand model concepts, processes and applications based on the previous base year 2000 Coos Bay/North Bend OSUM.

During the second half of the workshop, the local jurisdictions reviewed and updated the provided functional class, through lanes, posted speeds, traffic signal locations, and turn prohibition locations plots, which were based on the previous base year 2000 model network. After the workshop, TPAU staff modified the existing base year 2000 OSUM model network to create an interim year 2013 OSUM model network.

The base and future land use data (see Table 1) were presented to the local jurisdictions. By comparing the land use summaries for the previous base year 2000 to interim years 2010 through 2013, the local staff felt that there was enough change in terms of households, population and employment to first update the base year 2000 data to the 2013 interim year before building the future year 2035 scenario.

Table 1: 2000-2020 Actual and Forecasted Households, Population, and Employment ${ }^{1}$

| Year | Household | Population | Employment | Agricultural | Education | Government | Industrial | Other | Retail | Service |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2000 | 13,493 | 33,055 | 13,798 | 401 | 1,160 | 707 | 563 | 2,008 | 3,365 | 5,594 |
| 2010 | 14,287 | 34,187 | 14,273 | 339 | 1,051 | 879 | 576 | 1,516 | 2,285 | 7,627 |
| $2011^{2}$ | 14,366 | 34,300 | 14,511 | 403 | 1,053 | 833 | 625 | 1,630 | 2,275 | 7,692 |
| $2012^{2}$ | 14,525 | 34,526 | 14,359 | 424 | 1,039 | 801 | 576 | 1,501 | 2,257 | 7,761 |
| $2013^{2}$ | 14,763 | 34,866 | 14,529 | 405 | 1,026 | 777 | 650 | 1,532 | 2,320 | 7,819 |
| 2020 | 15,359 | 37,508 | 17,513 | 423 | 1,257 | 761 | 771 | 2,170 | 4,923 | 7,208 |

${ }^{1}$ Source: 2000/2020 Coos Bay OSUM (Oregon Small Urban Model) from ODOT TPAU (Transportation Planning Analysis Unit; 2010 Census; and 2010-2013 Oregon Quarterly Census Employment and Wages from the Oregon Employment Department.
${ }^{2} 2011-2013$ households and population are based on the 2000-2010 historical growth.
The second outreach workshop was held on March 16, 2015. TPAU staff brought into the workshop the updated 2013 existing condition model network posted speed and number of through lanes plots. The 2013 households and employment data by traffic analysis zones (TAZs) were also presented. Because the population changes from 2010 to 2013 are very insignificant or negligible, the 2010 US Census Household Summary Files for Coos County and 2013 Coos County Parcel GIS Database were both used to extract the household numbers and distributions by income categories (Low, Mid-low, Mid-High and High income groups) and household sizes (1, 2, 3, and 4+ persons). Oregon Employment Department, "2013 Geocoded Annual Quarterly Census Employment and Wages (QCEW)" data was aggregated into four employment sectors (Industrial, Retail, Service and Other) by TAZ. Local staff commented that the industrial employment is much lower than expected but the service employment is much larger due to the hospital and the casino.

TPAU staff agreed to redistribute the employment numbers by 10 sectors, as shown in Table 2. No changes to the original four sector 2013 employment data were recommended. Local staff also provided current school (public, private, and vocational) and college enrollments and their respective locations as requested.

Table 2: 2013 Base Year Employment Categories from QCEW by 10 Sectors

| Description |
| :--- |
| Agriculture \& Forestry |
| Mining |
| Construction |
| Manufacturing |
| Transportation, Communication \& Public Utilities |
| Wholesale |
| Retail |
| Financial, Insurance \& Real Estate |
| Service |
| Government |

TPAU staff shared with the local staff the external traffic data that will feed into the interim base year 2013 and future year 2035 scenario shown in Figure 1.

Figure 1: Coos Bay/North Bend Model External Station AADT Trends and Forecasts


Note: 2000 and 2020 are forecasted from the original model while the other years are based on actual data and/or historical trends. Note: Hwy 9 is US101( Oregon Coast Hwy), Hwy240 is OR540 (Cape Arago Hwy), and Hwy241 is OR241 (Coos River Hwy).

## Future Household Allocation Methodology for Cities of Coos Bay/North Bend Future Scenario

This methodology uses a land suitability analysis to determine if there is enough land to accommodate growth and where the growth would occur. The methodology assumes that the proportion of new households in each TAZ is related to the relative development potential of the TAZ. This assumption reflects the belief that the new residential development tends to grow outward from existing residential land. If an area has high-density development currently, it will likely remain high-density in the future.

This process substantially reduced the time to create the future scenario values. Actual TAZ numbers do not matter in this process for the local staff, but just the potential of growth with available land which is closer to "planner language" rather than "modeler language."

In summary, the steps to develop the 2035 forecast are generally described below:

1. Use the base year land use total and Oregon State Financial and Economic Analysis and Portland State University Population Forecasts by County/Cities to figure out the total 2035 land use in the model area;
2. Based on the 2014 Coos County Parcel GIS Shape Files, extract the parcel acres of the existing and vacant parcels by residential, commercial, industrial and other property classes;
3. Identify the growth potential by ranking the TAZs with 0,1 , 2 , and 3 for no growth ( $0 \%$ ), low ( $50 \%$ ), medium ( $80 \%$ ) and high (100\%) with respective land uses;
4. Calculate the current population density of residential land with each TAZ and residential land available for development based on the buildable land inventory and potential growth ranking;
5. Allocate the future year 2035 population total in terms of household total into each TAZ according to the relative potential capacity for residential development;
6. Use the existing Coos Bay 2013 model to figure out the accessibilities to each TAZ as one of the variable to determine the employment capacity;
7. Calculate the employment capacity by retail, service, industrial and other sectors by TAZ according to the available vacant land (by commercial, industrial and other category) and growth potential rankings; and
8. Apply the future 2035 total employment forecasts by sector to allocate the potential employment growth to TAZs based on the buildable land capacity and potential growth rankings

The percentage growth potentials are assumed as ranking scenarios. Both Coos Bay and North Bend provided rankings by land use sectors by TAZ which were applied while county areas were based on the assumed medium ranking of 2 . The ranking is an important indicator or variable in the future land use forecasts. The local staff reviewed the overall land use forecast plots and provided comments if they saw too much or too little growth by land use sector. The land use allocation forecasts were adjusted based on the comments.

In addition, TPAU asked the local jurisdictions to confirm if there were any funded projects (bond measures, capital improvement plan if available) that would affect the future model network (new roadways, signals, lane changes, speeds) beyond what was already shared with at the outreach meetings (i.e. US101 speed changes, road diets, new signals). No new projects were indicated except for some speed changes in the future network.

The existing population/employment ratio from the base year was applied to the future year so an initial total employment value was generated. Future population projections were already in-hand. The difference between the future projections and the base year will be the amount needed to be applied via the local development potential rankings. These will generate the future scenario(s) based on these rankings using different percentage splits.

## Local Jurisdictional Review and Comments

The draft base 2013 and future 2035 land use forecasts by TAZ were sent to the local jurisdictions for review and comments. The data for review included households and retail, service, industrial and other employees. Comments were received from both cities and incorporated into the final 2035 future scenario land use forecasts and input to the updated Coos Bay/North Bend travel demand forecasting model.

## Draft Final Model Input

Table 3 below lists the 2035 future year scenario land use summary by sectors compared with the interim base year 2013 scenario. The aggregated household growth from interim year 2013 to future year 2035 is 1,071 households while the aggregate total employment growth is 3,445 employees which consist of 550 in retail, 1,865 in service, 145 in industrial and 885 in other sectors.

Table 3: Future Year 2035 Scenario Land Use Forecasts vs Interim Year 2013

| Land Use Type | Interim Year 2013 | Future Year 2035 | Growth 2013 to 2035 |
| :--- | :---: | :---: | :---: |
| Households | 14,287 | 15,358 | 1,071 |
| Retail | 2,298 | 2,847 | 550 |
| Service | 7,808 | 9,673 | 1,865 |
| Industry | 617 | 764 | 145 |
| Other | 3712 | 4597 | 885 |
| Total Employment | 14,435 | 17,880 | 3,445 |

## Draft Final Model Output

The draft final future year 2035 scenario land use forecasts were applied in the OSUM travel demand modeling steps to create the future year 2035 scenario Coos Bay/North Bend model. The model generates daily vehicle trips and assigns 24 -hour vehicle trips to the roadway network. Table 4 lists the daily generated totals by comparing the interim base year 2013 with future year 2035 scenario.

Table 4: Future Year 2035 Scenario Daily Trip Generation vs Interim Year 2013

| Scenario | Total Generated <br> Trips |
| :---: | :---: |
| Base 2013 | 132,502 |
| Future 2035 | 142,724 |
| $2013-2035$ Difference | 10,222 |

Figures 2 and 3 show the interim base year 2013 PM peak hour (5-6 PM) roadway link volume and the link volume-to-capacity forecasts respectively. Figures 4 and 5 show the future 2035 scenario PM peak hour (5-6 PM) roadway link volume and the link volume-to-capacity forecasts respectively.

The Coos Bay/North Bend travel demand model is now ready for application for the current City of North Bend Transportation and Growth Management (TGM) grant and for any other transportation or land use planning application.

Attachments
cc: Brian Dunn, ODOT Transportation Planning Analysis Unit Manager





Anのー. D
STIP Projects

## Draft STIP for 2018-2021 (Southwest Oregon)

All 46 projects include name, location (milepoint and county), description, work type, total cost, applicant and key number. All cost figures are preliminary estimates. Some projects that span multiple highways or locations may not appear on the map below.


## Interstate 5 (Pacific Highway)

1. I-5: Elkhead to Rice Hill (NB Lanes) - Location: MP 147.78 to 154.88 (Douglas County). Description: Design shelf ready project to grind and pave northbound lanes with asphalt. Work Type: Preservation. Total Cost: $\$ 300,000$. Applicant: ODOT. Key \# 20105.
2. I-5: Sutherlin to Garden Valley Blvd. - Location: MP 125.00 to 136.50 (Douglas County). Description: Grind and pave travel lanes, remove concrete at abandoned Weigh-in-Motion site in the southbound lanes at MP 130.62, upgrade culverts in poor or critical condition. Work type: Operations, Preservation. Total cost: \$21,228,000. Applicant: ODOT. Key \# 20588.
3. I-5: North Umpqua River \& CORP (Winchester) Bridge - Location: MP 128.76 (Douglas County). Description: Remove rust, repair cracks and replace rivets and bolts as needed; paint the steel trusses. Work type: Bridge. Total cost: \$9,359,000. Applicant: ODOT. Key \# 20464.

## Draft STIP for 2018-2021 (Southwest Oregon)

4. I-5: North Umpqua River \& CORP (Winchester SB) Bridge Repair - Location: MP 128.76 (Douglas County). Description: Replace clip angles due to cracking. Work type: Bridge. Total cost: \$2,400,000. Applicant: ODOT. Key \# 19657.
5. I-5: Exit 124 Signal Upgrades \& Bellows Street Realignment - Location: MP 124.00 (Douglas County). Description: Replace signal poles and hardware at the northbound and southbound ramp terminals, add turn lanes and realign Bellows Street and the southbound off-ramp. Work Type: Operations. Total cost: \$1,810,000. Applicant: ODOT. Key \# 20148.
6. I-5: South Umpqua River (Vets) Bridge Repairs - Location: MP 124.47 (Douglas County). Description: Provides seismic retrofit, resurfaces deck, paints steel truss, repairs joints, bearings and other areas to Bridge \#07404. Work Type: Bridge. Total cost: \$13,442,000. Applicant: ODOT. Key \# 18585.
7. I-5: Garden Valley Blvd. to Roberts Creek - Location: MP 117.70 to 125.40 (Douglas County). Description: Design shelf ready plans to remove existing pavement and replace with new asphalt. Work type: Preservation. Total cost: \$700,000. Applicant: ODOT. Key \# 20106.
8. I-5: Roberts Mountain to South Umpqua River Paving \& Climbing Lanes - Location: MP 112.57 to 117.74 (Douglas County). Description: Grind/inlay paving and construction of southbound climbing lane. Work type: Modernization, preservation, interstate maintenance. Total cost: \$20,227,016. Applicant: ODOT. Key \# 18967.
9. I-5: South Umpqua River (Fords) \& Yokum Road Bridges - Location: MP 101.32 (Douglas County). Description: Repair the deck expansion joints, repair and overlay the deck. Work type: Bridge. Total cost: \$2,802,000. Applicant: ODOT. Key \# 20101.
10. I-5: Small Culvert Upgrades - Location: MP 40.00 to 168.00 (Douglas County). Description: Repair or replace culverts in poor or critical condition based on current condition assessment. Work type: Culverts. Total cost: $\$ 1,386,000$. Applicant: ODOT. Key \# 20159.

## Oregon 38 (Umpqua Highway)

11. OR 38: U.S. 101 to Dean Creek Paving \& Pedestrian Improvements - Location: MP 0.00 to 5.90 (Douglas County). Description: grind/inlay, pedestrian improvements, signal upgrades, road diet and other safety improvements. Work type: BikePed, Enhance, Modernization. Operations, Preservation, Safety. Total cost: \$7,162,000. Applicant: ODOT. Key \# 18869.
12. OR 38: Hoagland Creek and Unnamed Creek Culverts - Location: MP 7.52 to 8.79 (Douglas County). Description: Two large culvert replacements. Work type: Culverts, Fish passage. Total cost: \$2,630,000. Applicant: ODOT. Key \# 19810.
13. OR 38: Scottsburg Bridge East Approach Realignment -- Location: MP 16.70 (Douglas County). Description: horizontal curve adjustment, realignment of bridge rail, construction of retaining wall on Bridge \#01318. Work type: Operations. Total cost: \$2,500,000. Applicant: ODOT. Key \# 18901.
14. OR 38: Sawyer Rapids to I-5 Chip Seal - Location: MP 26.60 to 56.87 (Douglas County). Description: Chip seal project. Work type: Preservation. Total cost: \$1,435,278. Applicant: ODOT. Key \# 19795.

## Oregon 138E (North Umpqua Highway)

15. OR 138E: Dog Creek Culvert - Location: MP 45.25 (Douglas County). Description: Install spiral liner in existing culvert. Work type: Culverts. Total cost: \$283,000. Applicant: ODOT. Key \# 20154.

## Oregon 42 (Coos Bay to Roseburg Highway)

16. OR 42: Bridge over U.S. 101 - Location: MP 0.05 (Coos County). Description: Replace bridge on same general alignment. Work type: Bridge. Total cost: \$3,166,000. Applicant: ODOT. Key \# 20467.
17. OR 42: Cedar Point Road to Finley Loop (Coquille) - Location: MP 9.68 to 15.20 (Coos County). Description: Grind out the existing pavement and replace with new asphalt. Replace ADA ramps, reconstruct the roadway at mile point 10.10 to improve drainage, level the pavement at the bridge approaches between mile point 10.40 and 10.70, and upgrade culverts. Work type: Operations, Preservation. Total cost: \$9,757,567. Applicant: ODOT. Key \# 20147.

# Draft STIP for 2018-2021 (Southwest Oregon) 

18. OR 42: Frenchie Creek Culvert - Location: MP 35.57 (Coos County). Description: Design work to prepare for replacement of a culvert on Hwy 42. Work Type: Culverts. Total cost: \$269,000. Applicant: ODOT. Key \# 20132.
19. OR 42: County Line Slide Retaining Wall - Location: MP 44.50 to 44.90 (Douglas County). Description: Construct a retaining wall to stabilize the slide area above the highway, and complete $2.5^{\prime \prime}$ grind/inlay paving between mile point 44.50 and 45.90. Work type: Operations, emergency relief. Total cost: \$5,155,001. Applicant: ODOT. Key \# 19938.
20. OR 42: Lower Lookingglass Creek Bridge Repair - Location: MP 72.50 (Douglas County). Description: Bridge rail retrofit and deck overlay. Work type: Bridge. Total cost: \$439,000. Applicant: ODOT. Key \# 18586.

## Oregon 542 (Powers Highway)

21. OR 542: Rhoda Creek Culvert Replacement - Location: MP 1.87 (Coos County). Description: Replace existing culvert with 17-foot pipe. Work type: Culverts, Fish passage. Total Cost: \$1,696,418. Applicant: ODOT. Key \# 18260.
22. OR 542: Powers to Agness Highway: Burma Slide Section - Location: MP 4.40 to 8.40 (Coos County). Description: Slide stabilization. Work type: Modernization, Operations. Total cost: \$19,139,750. Applicant: Other. Key \# 13933.
23. OR 542: Long Tom Creek Culvert - Location: MP 12.04 (Coos County). Description: Design and property acquisition in preparation to replace the culvert with a bridge; the project will also address the large head cut at the culvert. Work type: Culverts. Total cost: \$281,000. Applicant: ODOT. Key \# 20134.

## U.S. 101 (Oregon Coast Highway)

24. U.S. 101: Tahkenitch Creek \& Tenmile Creek Bridges - Location: MP 202.70 (Douglas County) and 223.20 (Coos County). Description: Design shelf ready plans for bridge rail on Tahkenitch Creek and Tenmile Creek Bridges, patch concrete girders on Tahkenitch Creek Bridge. Work type: Bridge. Total cost: \$303,000. Applicant: ODOT. Key \# 20097.
25. U.S. 101: Culvert \& Fish Passage Upgrades, Phase 2 - Location: MP 210.00 to 243.90 (Coos County). Description: Replace approximately 12 culverts and repair approximately 30 small culverts. Work type: Culverts, Fish passage. Total cost: \$1,510,000. Applicant: ODOT. Key \# 19739.
26. U.S. 101: McCullough Bridge (Coos Bay) Painting - Location: MP 233.48 to 234.50 (Coos County). Description: Paints bridge. Work type: Bridge. Total cost: \$30,811,000. Applicant: ODOT. Key \# 18914.
27. U.S. 101: Johnson Ave. Intersections (Coos Bay) - Location: MP 238.92 (Coos County). Description: Improve signal phasing and coordination at the two U.S. 101/Johnson Avenue intersections. Work type: Safety. Total cost: \$1,195,000. Applicant: ODOT. Key \# 20246.
28. U.S. 101: Bay Area Sidewalks/Flanagan Road Signal - Location: MP 239.35 to 240.10 (Coos County). Description: Upgrade existing sidewalk, replace signal poles and hardware at Flanagan Road, upgrade illumination. Work type: Bike-Ped, Operations. Total cost: \$2,024,600. Applicant: ODOT. Key \# 19243.
29. U.S. 101: Coquille River (Bullards) Bridge - Location: MP 259.58 (Coos County). Description: Bridge rail replacement. Work type. Bridge. Total cost: \$1,609,000. Applicant: ODOT. Key \# 19975.
30. U.S.101: Sixes to Port Orford Paving - Location: MP 295.00 to 301.45 (Curry County). Description: Resurface travel lanes, replace rail on two bridges, upgrade ADA Ramps. Work type: Bridge, Preservation. Total cost: $\$ 3,381,000$. Applicant: ODOT. Key \# 18870.
31. U.S. 101: Garrison Slough Bridge - Location: MP 299.96 to 300.05 (Curry County). Description: Apply cathodic protection treatment for corrosion control. Work type: Bridge. Total cost: \$2,238,000. Applicant: ODOT. Key \# 20468.
32. U.S. 101: Rogue River Bridge (Gold Beach) - Location: MP 327.51 to 327.88 (Curry County). Description: Repair, strengthen and overlay the deck. Work type: Bridge. Total cost: \$3,590,000. Applicant: ODOT. Key \# 20466.
33. U.S. 101: Parkview Drive to Easy Street Sidewalks (Brookings) - Location: MP 355.86 to 356.30 (Curry County). Description: Construct a 6' bike lane and 6' sidewalk along the east side of U.S. 101. Work type: Modernization, Safety. Total cost: \$1,796,000. Applicant: City of Brookings. Key \# 20261.

# Draft STIP for 2018-2021 (Southwest Oregon) 

## Oregon 241 (Coos River Highway)

34. OR 241: Coos River Highway Culverts - Location: MP 3.20 to 6.31 (Coos County). Description: Replace culverts and tidegates. Work type: Operations. Total cost: \$2,521,000. Applicant: ODOT. Key \# 20150.

## Oregon 540 (Cape Arago Highway)

35. OR 540: Broadway at Newmark Realignment (North Bend) - Location: MP 1.70 (Coos County). Description: Upgrade signal poles and hardware, convert the 4-Lane roadway to 3-lane roadway with center turn lane, install bike lanes. Work type: Safety. Total cost: \$2,357,000. Applicant: ODOT. Key \# 20219.

## Multiple highways

36. OR 42 at MP 50/U.S. 101 at Anderson Rock - Locations: OR 42 at MP 50.00 (Douglas County) and U.S. 101 at MP 334.30 (Curry County). Description: Design and property acquisition in preparation for the installation of rock fall screening and safety barrier. Work type: Operations. Total cost: \$137,001. Applicant: ODOT. Key \# 20131.
37. U.S. 101/OR 38: Hazard Warning Sign Upgrades - Location: Various highways in Coos, Curry and Douglas County Description: Replace existing hazard warning system with LED-based variable message (VMS) system (VMS). Work type: Operations. Total cost: $\$ 2,622,227$. Applicant: ODOT. Key \# 20153. (Not shown on map.)
38. Region 3 FLAP Match Bucket - Location: Various highways. Description: Funding bucket for match requirements on Federal Lands Access Program (FLAP) project K13933. Work type: Operations, modernization. Total cost: \$981,847. Applicant: ODOT. Key \# 19593. (Not shown on map.)

## Local projects

39. Riverside Drive: Ferry Creek Bridge (Bandon) - Location: MP 0.01 (Coos County). Description: Replace current bridge with a new single span pre-stressed concrete structure that meets the current standards on abutments behind existing abutments. Work type: Bridge. Total cost: \$3,024,276. Applicant: City of Bandon. Key \# 20369.
40. Curry County Transit Vehicle Replacement - Location: Curry County. Description: Purchase replacement vehicles (two buses and one van). Work type: Transit. Total cost: \$312,047. Applicant: Curry County. Key \# 20172. (Not shown on map.)
41. Floras Creek Road Bridge - Location: MP 8.90 (Curry County). Description: Replace current bridge east of Langlois with new single-span bridge on new alignment. Work type: Bridge. Total cost: \$2,389,728. Applicant: Curry County. Key \# 20370.
42. Dancer Road: Dancer Creek Bridge - Location: MP 0.07 (Douglas County). Description: Replace current four-span timber bridge north of Camas Valley with a new concrete bridge with fewer spans on the same alignment. Work type: Bridge. Total cost: $\$ 2,846,340$. Applicant: Douglas County. Key \# 20368.
43. Douglas County Warning Sign Upgrades - Location: Various Douglas County roads. Description: Install curve signs, chevrons and flashing beacon on North Bank Road; install curve signs and chevrons on Glenbrook Loop, Riddle Bypass Road, Sixth Avenue, Tiller-Trail Highway and Garden Valley Road. Work type: Safety. Total cost: \$398,000. Applicant: Douglas County. Key \# 20248. (Not shown on map.)
44. Roseburg Pedestrian Upgrades - Location: Various locations in Roseburg (Douglas County). Description: Install rapid flasher on Stephens Street at Roseland; countdown pedestrian signals on Stephens Street at Edenbower, Newton Creek and Stewart Parkway; and on Harvard Avenue at Stewart Parkway, Keady Court, Centennial Drive and Umpqua Street. Work type: Safety. Total cost: \$502,000. Applicant: City of Roseburg. Key \# 20250.
45. Soup Creek Road: Soup Creek Bridge - Location: MP 1.15 (Douglas County). Description: Replace existing timber bridge near Loon Lake with a pre-cast concrete bridge. Work type: Bridge. Total cost: \$827,237. Applicant: Douglas County. Key \# 20365.
46. Upper Olalla Road: Berry Creek Bridge - Location: MP 7.39 (Douglas County). Description: Replace current bridge, located about 10 miles southwest of Winston, with a new single-span bridge on the same alignment. Work type: Bridge. Total cost: $\$ 3,094,043$. Applicant: Douglas County. Key \# 20358.

Appendix C
Volume Development

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{2}{|r|}{\multirow[t]{3}{*}{Existing Year Project Forecast Year Model Base Year Model Forecast Year}} \& \multirow[t]{3}{*}{\[
\begin{aligned}
\& 2017 \\
\& 2004 \\
\& 2043 \\
\& 2035 \\
\& 2035
\end{aligned}
\]} \& \& \& \& \& \& \& \& \& \& \& \& \& \& \multicolumn{3}{|r|}{\begin{tabular}{l}
Sidestreets not included in the regional model \\
Greater than \(10 \%\) difference between difference and growth methods Numbers adjusted from model to work with spreadsheet ( 0 growth \(=1\) )
\end{tabular}} \& \multirow[t]{2}{*}{USE DIFFERENCE} \\
\hline \& \& \& \& \& Model \& ssignment \& \& \& \& \& \& \& \& \& \& \& \& \& \\
\hline \& \& \& \[
\begin{gathered}
\hline \text { Exxsting } \\
\text { 30HVV }
\end{gathered}
\] \& Baseline Basel
Mode \& \[
\begin{gathered}
\text { Future Rer } \\
\text { Model }
\end{gathered}
\] \& \[
\begin{aligned}
\& \text { Interpolated } \\
\& \text { Model }
\end{aligned}
\] \& Forecasted Model \& \({ }^{2013 \cdot 2035}\) Compar \& Model \& \({ }_{\substack{2017-200 \\ \text { Comp }}}\) \& - F Mrodel \& \& stricess ture 2040 N \& ssed Volumes No Build Yea \& \& \& \& \& \\
\hline 11 \& \multirow[b]{12}{*}{\(\left.\right|^{\text {Arthur Streetat Colorado Loop }}\)} \& Direction \& 2017 \& 2013 \& 2035 \& 2017 \& 2040 \& Total Growth \&  \& \[
\begin{gathered}
\text { Total } \\
\hline \text { Trowth }
\end{gathered}
\] \& \[
\begin{array}{|l|l|l|l|l|l|}
\hline \text { Difference }
\end{array}
\] \& \[
\begin{array}{|c|c|}
\hline \text { Volume } \\
\hline \text { Difference } \\
\hline
\end{array}
\] \& \[
\begin{array}{|c|}
\hline \text { Vocoue } \\
\hline \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|l|}
\hline \text { Percent } \\
\text { Pifference }
\end{array}
\] \& Average \& \[
\left.\begin{array}{|c}
\text { Forecast } \\
\text { Used }
\end{array} \right\rvert\,
\] \& Method Used \& Comments \& Additional Comments \\
\hline \multirow[b]{10}{*}{} \& \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \\
\hline \& \& IN \& 15 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& \({ }^{15}\) \& \({ }^{15}\) \& 0\% \& 15 \& \({ }^{15}\) \& Average of Difference and Growh \& Assumed no growth in link volumes \& \\
\hline \& \& Out \& 15 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 15 \& 15 \& 0\% \& 15 \& 15 \& Average of Difference and Growh \& Assumed no growthin link volumes \& \\
\hline \& \& Westleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \\
\hline \& \& \(\underline{1 N}\) \& 6 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& \({ }^{0.0 \% \%}\) \& 0.0\% \& 0 \& 6 \& 6 \& \%\% \& 6 \& 6 \& Average of Differerce and Growth \& Assumed no growt in link volumes \& \\
\hline \& \& \(\xrightarrow{\text { Out }}\) \& 6 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 6 \& 6 \& 0\% \& 6 \& 6 \& Average of Difference and Growh \& Assumed no growh in link volumes \& \\
\hline \& \& iN \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divol \& \#DiVo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \& \& \& \\
\hline \& \& Out \& 0 \& \& \& \#olvo! \& \#Divo! \& \#Divo! \& \#oivo! \& \#Divo: \& \#Divo! \& \#Divo! \& \#Divo! \& \#DVIV: \& \#Divo: \& \& \& \& \\
\hline \& \& South Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \\
\hline \& \& 1 N \& 11 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 11 \& 11 \& \%\% \& 11 \& 11 \& Average of Differerce and Gowth \& Assumed no growtin inink volumes \& \\
\hline \multirow[b]{11}{*}{(eltak} \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& Average ofoimerence and Gown \& \& \\
\hline \& \multirow[t]{10}{*}{Oak StreetW Airpor Way at Colorado Avenue/Maple Leaf} \& East Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \\
\hline \& \& \({ }^{10}\) \& \({ }_{1}^{58}\) \& \({ }^{35}\) \& \begin{tabular}{l}
35 \\
34 \\
\hline
\end{tabular} \& 35

24 \& ${ }^{35}$ \& 0.0\% \& ${ }^{0.0 \% \%}$ \& 0.0\% \& 0 \& ${ }_{1}^{58}$ \& | 58 |
| :--- |
| 122 | \& \%\% \& ${ }_{128}^{58}$ \& ${ }_{128}^{58}$ \& Average of Difference and Growh \& \& ${ }^{2035}$ model showed d decreasese 3 3 3 in and 23 out <br>

\hline \& \& West Leg \& 122 \& ${ }^{24}$ \& ${ }^{24}$ \& ${ }^{24}$ \& ${ }^{24}$ \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 122 \& 122 \& 0\% \& 122 \& 122 \& Average of Difference and Growh \& \& 2035 model showed a decrease: 33 in and 23 out <br>
\hline \& \& IN \& ${ }^{131}$ \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& ${ }^{131}$ \& ${ }^{131}$ \& 0\% \& 131 \& 131 \& Average of Difference and Growh \& \& <br>
\hline \& \& Out \& 61 \& 2 \& 2 \& 2 \& 2 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 61 \& 61 \& 0\% \& 61 \& 61 \& Average of Difference and Growh \& \& <br>
\hline \& \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& Out \& 3 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 3 \& 3 \& \% \& 3 \& 3 \& Average of ifiference and Griowh \& Assumed no growt in link volumes \& <br>
\hline \& \& South Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& IN \& 7 \& ${ }^{23}$ \& ${ }^{23}$ \& ${ }^{23}$ \& ${ }^{23}$ \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 7 \& 7 \& \% \& 7 \& 7 \& Average of Difference and Growh \& Absolute difference $10 \% \rightarrow$ S sed difference only \& 2035 model showed adecrease: 22 i in and 31 out <br>
\hline \& \& Out \& 14 \& ${ }^{33}$ \& ${ }^{33}$ \& 33 \& 33 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 14 \& 14 \& 0\% \& 14 \& 14 \& Average of Difference and Growh \& Absolute ifference $10 \% \rightarrow$ Useddifference only \& 2035 model showed d decerase: 22 in and 31 out <br>
\hline \multirow[b]{10}{*}{} \& \multirow[t]{10}{*}{Maple Leaf at Aipor Way} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& ${ }^{1 N}$ \& 70 \& ${ }_{5}^{47}$ \& ${ }_{5}^{47}$ \& 47 \& 47 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 70 \& 70 \& 0\% \& 70 \& 70 \& Average of Difference and Growh \& \& <br>
\hline \& \& Out \& 140 \& 58 \& 58 \& 58 \& 58 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 140 \& 140 \& 0\% \& 140 \& 140 \& Average of Difference and Growh \& Assumed no grownt in link volumes \& 2035 model showeda decrease: 53 ut <br>
\hline \& \& Westleg \& \& \& ${ }^{58}$ \& \& \& \& 0.0\% \& \& 0 \& 131 \& ${ }^{131}$ \& 0\% \& 131 \& 131 \& Average of ifiference and Growh \& Assumed no growth in link volumes \& 2035 model showeda decrease: 53 out <br>
\hline \& \& Oit \& 66 \& 47 \& 47 \& 47 \& 47 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 66 \& 66 \& 0\% \& 66 \& 66 \& Average of Difference and Grown \& \& <br>
\hline \& \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& iN \& 11 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 11 \& 11 \& 0\% \& 11 \& ${ }^{11}$ \& Average of Difference and Growh \& Assumed no growth in link volumes \& <br>
\hline \& \& Out \& 6 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 6 \& 6 \& 0\% \& 6 \& 6 \& Average of Difference and Growh \& Assumed no growt in link volumes \& <br>
\hline \& \& Sout Leg \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DVV0! \& \#Divo! \& \#Divo: \& \#DIV0! \& \#DIVO! \& \& \& \& <br>
\hline \& \& Out \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DIVo! \& \& \& \& <br>
\hline \multirow[t]{10}{*}{$\left.\right|^{40}$} \& \multirow[t]{10}{*}{US 101 a a Florida Avenue} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& ${ }^{1 N}$ \& ${ }_{3}^{21}$ \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& ${ }^{0.0 \%}$ \& ${ }^{0.0 \%}$ \& 0 \& ${ }_{3}^{21}$ \& ${ }^{21}$ \& 0\% \& ${ }_{3}^{21}$ \& ${ }_{3}^{21}$ \& Average of Differerce and Growh \& Assumed no growth in link volumes \& <br>
\hline \& \& $\frac{\text { Out }}{\text { Westleg }}$ \& 3 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 3 \& 3 \& \% \& 3 \& 3 \& Average of Difference and Growth \& Assumed no growh in inink volumes \& <br>
\hline \& \& Westleg \& 256 \& ${ }^{336}$ \& 361 \& ${ }^{341}$ \& 367 \& 7.4\% \& 0.3\% \& 7.7\% \& 26 \& 282 \& 276 \& 2\% \& 279 \& 279 \& Average of Difference and Growh \& \& <br>
\hline \& \& Out \& 26 \& 17 \& 17 \& 17 \& 17 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 26 \& 26 \& 0\% \& 26 \& 26 \& Average of ifiference and Growh \& \& <br>
\hline \& \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& IN \& 761 \& 632 \& 720 \& 648 \& ${ }_{7} 740$ \& 13.\% \& 0.6\% \& 14.2\% \& 92 \& 853 \& 869 \& 2\% \& 861 \& 861 \& Average of Difference and Growh \& \& <br>
\hline \& \& Out \& 925 \& 649 \& 740 \& ${ }^{666}$ \& 761 \& 14.0\% \& 0.6\% \& 14.3\% \& ${ }^{95}$ \& 1020 \& 1057 \& 4\% \& 1039 \& 1039 \& Average of Difference and Growh \& \& <br>
\hline \& \& ${ }_{\text {Sout Leg }}^{\text {IN }}$ \& 691 \& ${ }^{313}$ \& 379 \& 325 \& ${ }^{394}$ \& 21.1\% \& 1.0\% \& 21.2\% \& 69 \& 760 \& ${ }^{838}$ \& 10\% \& 799 \& 760 \& Difference Method \& Absolut difference $>10 \% \rightarrow$ Used difference only \& <br>
\hline \& \& Out \& 775 \& 615 \& 703 \& 631 \& 723 \& 14.3\% \& 0.7\% \& 14.6\% \& 92 \& 867 \& 888 \& 2\% \& 877 \& 867 \& Difference Metrod \& To be consisitent with method used for opposing direction \& <br>
\hline \multirow[t]{11}{*}{$\underbrace{50}$} \& \multirow[t]{11}{*}{Viginia Avenue at Arthur Street} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& ${ }^{1 N}$ \& 170 \& 70 \& ${ }^{83}$ \& 72 \& ${ }^{86}$ \& 18.6\% \& 0.8\% \& 18.8\% \& ${ }^{14}$ \& ${ }^{184}$ \& ${ }^{202}$ \& 10\% \& 193 \& ${ }^{184}$ \& Difference Method \& Absolute difference $10 \% \rightarrow$ Usedd diference only \& <br>
\hline \& \& Out \& 105 \& 39 \& 46 \& 40 \& 48 \& 17.9\% \& 0.8\% \& 18.2\% \& 7 \& 112 \& 124 \& 10\% \& 118 \& 112 \& Difference Method \& Absolute ifference $70 \% \rightarrow$ Used difference only \& <br>
\hline \& \& Westleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& IN \& ${ }_{1}^{105}$ \& 61 \& ${ }^{68}$ \& 62 \& 70 \& 11.5\% \& $0.55 \%$ \& 11.8\% \& 7 \& $\frac{112}{164}$ \& 117 \& 4\% \& 115 \& 115 \& Average of Difference and Growh \& \& <br>
\hline \& \& Out \& 152 \& 101 \& ${ }^{112}$ \& 103 \& 115 \& 10.9\% \& 0.5\% \& 11.2\% \& 12 \& 164 \& 169 \& 3\% \& 166 \& 166 \& Average of Difference and Growh \& \& <br>
\hline \& \& Noort Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& ${ }^{10}$ \& 7 \& ${ }^{31}$ \& ${ }^{31}$ \& ${ }^{31}$ \& ${ }_{31}^{32}$ \& 0.0\% \& 0.0.0 0 \& $0.0 \%$ \& $\bigcirc$ \& 7 \& 7 \& 0\% \& 7 \& 7 \& Average of Difference and Growh \& \& $2{ }^{2035}$ model showed a decerase: 29 in <br>
\hline \& \& South Leq \& \& 22 \& 22 \& 22 \& 22 \& \& \& 0.0\% \& \& ${ }^{25}$ \& 25 \& \% \& 25 \& \& Average of inimerence and crown \& \& <br>
\hline \& \& IN \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divol \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \& \& Out \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DIVO! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \multirow[t]{10}{*}{$\underbrace{60}$} \& \multirow[t]{10}{*}{Virgina Avenue at Oak Street} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>

\hline \& \& \& \[
$$
\begin{aligned}
& \frac{325}{210}
\end{aligned}
$$

\] \& ${ }_{176}^{148}$ \& ${ }^{166}$ \& ${ }_{178}^{148}$ \& ${ }_{9} 171$ \& \& ${ }^{0.7 \% \%}$ \& 15.5\% \& ${ }_{14}^{23}$ \& | 348 |
| :--- |
| 24 | \& \& 8\% \& \& 348

24
224 \& Differnee Method \& \& <br>

\hline \& \&  \& 210 \& 76 \& ${ }^{89}$ \& 78 \& 92 \& $$
17.1 \%
$$ \& 0.8\% \& 17.3\% \& 14 \& 224 \& 246 \& 10\% \& 235 \& 224 \& Difference Method \& Absolute difference $>10 \% \rightarrow$ Used difference only \& <br>

\hline \& \& IN \& 190 \& 59 \& 71 \& 61 \& 74 \& ${ }^{20.3 \%}$ \& 0.9\% \& 20.5\% \& ${ }^{13}$ \& ${ }^{203}$ \& 229 \& 12\% \& 216 \& 203 \& Difference Method \& Absolute difference $10 \%$ - Used diference only \& <br>
\hline \& \& Out \& 302 \& 144 \& 168 \& 148 \& 173 \& 16.7\% \& 0.8\% \& 16.9\% \& 25 \& 327 \& ${ }^{353}$ \& 8\% \& 340 \& 327 \& Difference Method \& Tobe consisient with method used for opposing direction \& <br>
\hline \& \& Noort Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& IN \& ${ }^{32}$ \& ${ }_{2}^{24}$ \& ${ }_{2}^{22}$ \& ${ }^{24}$ \& ${ }_{2}^{22}$ \& -8.3\% \& -0.4\% \& ${ }^{-8.8 \%}$ \& $\stackrel{-2}{ }$ \& 30 \& ${ }^{29}$ \& 3\% \& 30 \& 30 \& Average of Differerce and Gowth \& \& <br>
\hline \& \& South Leg \& ${ }^{30}$ \& 2 \& ${ }^{27}$ \& 27 \& 27 \& 0.0\% \& .0.0\% \& 0.0\% \& - \& ${ }^{30}$ \& ${ }^{3}$ \& 0\% \& ${ }^{30}$ \& ${ }^{30}$ \& Average of iliference and Giowh \& \& <br>
\hline \& \& 1 N \& 75 \& 75 \& 76 \& 75 \& 76 \& 1.3\% \& 0.1\% \& 1.4\% \& 1 \& 76 \& 76 \& 0\% \& 76 \& 76 \& Average of Difference and Growh \& \& <br>
\hline \& \& Out \& 80 \& 55 \& 54 \& ${ }_{5} 5$ \& 54 \& -1.8\% \& -0.1\% \& -1.9\% \& - 1 \& 79 \& 78 \& 1\% \& 79 \& 79 \& Average of Difference and Gowth \& \& <br>
\hline \multirow[t]{5}{*}{70} \& \multirow[t]{5}{*}{Viginin A Avenue at Maple Street} \& East Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& $\stackrel{\text { IN }}{\substack{\text { Out }}}$ \& ${ }_{3}^{455}$ \& ${ }_{183}^{296}$ \& ${ }_{132}^{322}$ \& ${ }_{184}^{301}$ \& ${ }_{1}^{328}$ \& 8.8\% \& 0.4\% \& 9.0\% \& ${ }^{27}$ \& ${ }_{391}^{482}$ \& ${ }_{398}^{498}$ \& 3\% \& ${ }_{3}^{489}$ \& ${ }_{395}^{489}$ \& Average of Difference and Growh \& \& <br>
\hline \& \& West Leg \& 385 \& 183 \& 189 \& 184 \& 190 \& 3.3\% \& 0.1\% \& 3.4\% \& 6 \& 391 \& ${ }^{398}$ \& 2\% \& 395 \& \& Average of Difference and Growh \& \& <br>
\hline \& \& ${ }_{\text {IN }}$ \& $\stackrel{230}{360}$ \& ${ }_{162} 6$ \& ${ }_{1}^{80}$ \& ${ }_{11} 71$ \& ${ }_{19}^{83}$ \& 15.9\% \& 0.7\% \& 16.2\% \& ${ }^{12}$ \& ${ }_{3}^{242}$ \& $\frac{267}{414}$ \& 10\% \& 254 \& ${ }_{3}^{242}$ \& Difference Method \& Absolut differerce $10 \%$ - U Sed difference only \& <br>
\hline \& \& Out \& 360 \& 162 \& 186 \& 166 \& 191 \& 14.8\% \& 0.7\% \& 15.1\% \& 25 \& 385 \& 44 \& 7\% \& 400 \& 385 \& Difference Method \& Obe consisient with method used tor opposing direction \& <br>
\hline
\end{tabular}



| Existing Year Project Forecast Year Model Base Year Model Forecast Year | $\begin{aligned} & 2017 \\ & \begin{array}{c} 2040 \\ \\ \\ 2013 \\ \\ 2035 \end{array} \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Sidestreets not included in the regi Greater than $10 \%$ difference betw Numbers adjusted from model to w | en difference and growth methods ork with spreadsheet $(0$ growth $=1)$ | USE DIFFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Model | signment |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | $\underset{\substack{\text { Exsting } \\ \text { 30HV }}}{ }$ | Baselne Model | Future Rei Model | Model | Forecasted Model | ${ }^{2013.2035}$ | Model | ${ }_{\text {20mp }}^{2017.20}$ | FModel |  | St Process | ssed Volume No Build Yea |  |  |  |  |  |
| Intersection | Direction | 2017 | 2013 | 2035 | 2017 | 2040 | Total Growth |  | $\begin{aligned} & \text { Total } \\ & \text { Growth } \end{aligned}$ | $\begin{aligned} & \text { Volume } \\ & \text { Difference } \end{aligned}$ | $\begin{array}{\|c\|} \hline \text { Volume } \\ \text { Difference } \end{array}$ |  | $\begin{aligned} & \text { of ercent } \\ & \text { Difference } \end{aligned}$ | Average | $\begin{array}{\|c} \text { Forecast } \\ \text { Used } \end{array}$ | Method Used | Comments | Additional Comments |
| 140 Marion Avenue at Safeway Divieway | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 150 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 150 | 150 | 0\% | 150 | 150 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  | Out | 120 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 120 | 120 | 0\% | 120 | 120 | Average of Difference and drowh | Assumed no growthin link volumes |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | N | 0 |  |  | \#oivo! | \#Divo! | \#Divo! | \#oivo: | \#Divo! | \#Divo! | \#Divo! | \#Divo: | \#Divo! | \#Divo: |  |  |  |  |
|  | Out | 0 |  |  | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo: | \#Divo: |  |  |  |  |
|  | NorthLeg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | iv | $\stackrel{95}{80}$ | $\frac{2}{4}$ | 4 | $\stackrel{2}{4}$ | $\stackrel{2}{4}$ | $\frac{0.0 \%}{0.0 \%}$ | $\frac{0.0 \%}{0.0 \%}$ | 0.0\% | 0 | 95 80 | ${ }_{8}^{95}$ | \%\% | 95 80 | ${ }_{9}^{95}$ | Average of Differerce and Growth |  |  |
| DeltaE 0 | South Leg | 80 |  |  |  |  |  |  |  |  | ${ }^{80}$ |  |  |  | 80 | Average of Difference and Giowh |  |  |
| Delta330 | iv | ${ }^{85}$ | 4 | 4 | 4 | 4 | 0.0\% | 0.0\% | 0.0\% | 0 | ${ }^{85}$ | ${ }_{1}^{85}$ | 0\% | ${ }^{85}$ | ${ }^{85}$ | Average of Difference and Growh |  |  |
|  | Out | 130 | 2 | 2 | 2 | 2 | 0.0\% | 0.0\% | 0.0\% | 0 | ${ }^{130}$ | ${ }_{130}$ | 0\% | 130 | ${ }^{130}$ | Average of Difference and Gowh |  |  |
| ${ }^{150}$ Wassingion Avenue a US 101 SouthShemma Avenue | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | ${ }^{16}$ |  |  | \#Divo! | \#Divol | \#IDVO! | \#Divo! | \#Divo! | \#DVO! | \#Divo! | \#DIVo! | \#OVV! | \#DiVo! |  |  |  |  |
|  | Out | 16 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | - | 16 | 16 | \% | 16 | 16 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }_{\text {N }}^{10}$ | ${ }_{15}$ | 1 | 1 | 1 | 1 | 0.0\% | ${ }^{0.0 \% \%}$ | ${ }^{\text {0.0\% }}$ | 0 | ${ }^{15}$ | 6 <br> 15 | 0\% | 15 | 6 15 | Average of Differerce and Gowth | Assumed no growt in link volumes |  |
|  | Out | 15 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 15 | 15 | 0\% | 15 | 15 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  | IN | 840 | 765 | ${ }_{85}$ | 782 | 878 | 12.0\% | 0.5\% | 12.3\% | 96 | 936 | 943 | 1\% | 940 | 940 | Average of Difference and Growh |  |  |
|  | Out | 0 |  |  | \#oivo! | \#oivo: | \#Divo! | \#Divo! | \#Divo! | \#Divo: | \#Divo! | \#Divo! | \#Divo! | \#Divo! |  |  |  |  |
| DeltaE 0 | Southleg | 0 |  |  | \#Divo! | \#DIVO! | \#Divo! | \#Divo! | \#Divo! | \#DVIO! | \#Divo: | \#DVVo! | \#Divo: | \#DV0: |  |  |  |  |
| Deta35-1 | Out | 815 | 765 | 857 | 782 | 878 | 12.0\% | 0.5\% | 123\% | 96 | 911 | 915 | 0\% | 913 | 911 | Difference Method |  |  |
| 160 Pony Creek Road a C Cowell Lane | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{10}$ | 0 |  |  | \#Divo! | \#Divol | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo! |  |  |  |  |
|  | Out | 0 |  |  | \#Divo! | \#Divo! | \#Divo! | \#Divo: | \#Divo! | \#Divo! | \#Divo! | \#Divo: | \#Divo! | \#Divo: |  |  |  |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Out | ${ }_{70}$ | ${ }_{9}^{22}$ | ${ }_{9}^{22}$ | ${ }_{9}^{22}$ | ${ }_{9}^{22}$ | 0.0\% | 0.0.0\% | 0.0\% | 0 | ${ }_{70} 5$ | ${ }_{7}^{55}$ | 0\% | ${ }_{7} 50$ | ${ }_{70}^{55}$ | Average of ofifiference and Gowh |  |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | iN | ${ }_{170} 180$ | ${ }_{16}^{16}$ | ${ }^{16}$ | ${ }_{16}^{16}$ | ${ }_{16}^{16}$ | 0.0\% | 0.0\% | 0.0\% | 0 | ${ }_{170}^{180}$ | ${ }_{1} 170$ | 0\% | 1780 | 170 | Average of Difference and Growh |  |  |
|  | Out | 180 | 16 | 16 | 16 | 16 | 0.0\% | 0.0\% | 0.0\% | 0 | 180 | 180 | 0\% | 180 | 180 | Average of Difference and Growh |  |  |
| DelaE 0 <br> Delta13 | $\frac{\text { South Leg }}{\text { IN }}$ | 180 | 6 | 6 | 6 | 6 | 0.0\% | 0.0\% | 0.0\% | 0 | 180 | 180 | 0\% | 180 | 180 | Average of Difference and Growh |  |  |
| Della350 | Out | 155 | 19 | 19 | 19 | 19 | 0.0\% | 0.0\% | 0.0\% | 0 | 155 | 155 | 0\% | 155 | 155 | Average of Difference and Grown |  |  |
| 170 Oak Street at 16t/17/1 Street | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{10}$ | ${ }^{65}$ | ${ }^{105}$ | ${ }^{132}$ | ${ }^{110}$ | ${ }^{138}$ | ${ }^{25.7 \%}$ | ${ }^{1.2 \%}$ | ${ }^{25.7 \%}$ | ${ }^{28}$ | ${ }^{93}$ | ${ }_{8} 8$ | ${ }^{\text {13\%\% }}$ | 87 | ${ }^{93}$ | Difference Method | Absolute difference $>10 \% \rightarrow$ Used difference only |  |
|  | Out | 30 | 54 | 69 | 57 | 72 | 27.8\% | 1.3\% | 27.6\% | 16 | 46 | 38 | 18\% | 42 | 46 | Difference Method | Absolute difference $10 \% \rightarrow$ Used difference only |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Out | ${ }_{85}$ | 155 | 194 | ${ }_{162}$ | ${ }^{203}$ | ${ }^{25.2 \%}$ | ${ }^{1.1 .1 \%}$ | 25.2\% | 41 | ${ }_{126}$ | 106 | 17\% | ${ }_{116} 16$ | ${ }_{126} 12$ | Difierence Method | Absolute difference $10 \% \rightarrow$ Usedd diferencee only |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{1}$ | 70 | 29 | ${ }^{28}$ | 29 | ${ }^{28}$ | -3.4\% | -0.2\% | -3.6\% | -1 | 69 | ${ }^{67}$ | 2\% | ${ }^{68}$ | ${ }^{68}$ | Average of Difference and Growth |  |  |
|  | Out | 75 | ${ }^{64}$ | ${ }^{65}$ | 64 | 65 | 1.6\% | 0.1\% | 1.6\% | 1 | 76 | 76 | 0\% | 76 | 76 | Average of Difference and Growh |  |  |
| ${ }^{\text {DeflaE }} \mathbf{0}$ | Southleg | 95 | ${ }^{131}$ | 144 | ${ }^{133}$ | 147 | 9.9\% | 0.5\% | 10.2\% | 14 | 109 | 105 | 4\% | 107 | 107 | Average of Difference and Growh |  |  |
| Delta350 | Out | 85 | 51 | 56 | 52 | 57 | 9.8\% | 0.4\% | 10.1\% | 5 | 90 | 94 | 4\% | 92 | 92 | Average of Difference and Growh |  |  |
| 80 Broadway Streetat 16 Gh Street | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }_{0}^{1 N}$ | ${ }^{115}$ | $\stackrel{153}{31}$ | $\stackrel{160}{13}$ | ${ }_{154}^{154}$ | ${ }_{162}^{162}$ | ${ }^{4.6 \%}$ | ${ }^{0.2 \% \%}$ | 4.7\% | 7 | ${ }_{7}^{122}$ | ${ }_{7}^{120}$ | ${ }_{7}^{2 \%}$ | ${ }^{121}$ | ${ }_{77}^{121}$ | Average of Differerce and Gowth |  |  |
|  | Westleg | 70 | 31 | ${ }^{35}$ | 32 | 36 | 12.9\% | 0.6\% | 13.2\% | 4 | 74 | 79 | 7\% | 77 | 77 | Average of Difference and Gown |  |  |
|  | Westleg | ${ }^{42}$ | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 42 | 42 | 0\% | 42 | 42 | Average of Difference and Growh | Assumed no growht in link volumes |  |
|  | $\frac{\text { Out }}{\text { Ont }}$ | 50 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 50 | 50 | 0\% | 50 | 50 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  | North Leg |  |  |  |  |  |  |  | 0.0\% |  |  |  |  |  |  |  |  | 2035 model showed a decrease 641 in |
|  | Oit | 770 | 524 | ${ }_{533}$ | 526 | ${ }_{535}$ | 9.7.7\% | 0.1\% | 1.8\% | - | 719 | 723 | 0\% | 721 | 721 | Average of ifferenence and Gowin |  | 2035 modes showes a decrease:64 in |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ${ }^{\text {Petal3 }}$ O | ${ }^{10}$ | $\stackrel{725}{752}$ | ${ }_{5}^{514}$ | ${ }_{8}^{514}$ | $\stackrel{543}{5414}$ | ${ }_{5}^{566}$ | 2.2\% | 0.1\% | 23\% | ${ }^{13}$ | 738 <br> 752 | ${ }_{7}^{742}$ | 1\% | 740 752 | 740 752 | Average of Difference and Growh |  |  |
|  | Out | 752 | 814 | 814 | 814 | 814 | 0.0\% | 0.0\% | 0.0\% | 0 | 752 | 752 | \% | 752 | 752 | Average of Difference and Gowth |  | 2035 model showed adecrease: 786 out |
| 190 Broadway Avenue at 17 Th Street | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\mathrm{l}_{\substack{10}}^{\text {Out }}$ | ${ }_{8}^{11}$ | $\frac{1}{1}$ | $\frac{1}{1}$ | 1 | 1 | 0.0\% | 0.0\% 0.0 | 0.0\% | 0 | ${ }_{8}^{11}$ | ${ }_{8}^{11}$ | 0\% | ${ }_{8}^{11}$ | 11 | Average of Difference and Growth Average of Difierence and Growth | Assumed no growh in link volumes |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 26 | 52 | 66 | ${ }_{5} 5$ | 69 | 26.9\% | 1.2\% | 26.8\% | 15 | 41 | 33 | 21\% | ${ }^{37}$ | 41 | Difference Method | Absolute ifference $70 \% \rightarrow$ Used difference only |  |
|  | Out | 46 | 119 | 148 | 124 | 155 | 24.4\% | 1.19\% | 24.4\% | 30 | 76 | 57 | 29\% | 67 | 76 | Difference Method | Absolite difference $10 \% \rightarrow$ Used difference only |  |
|  | $\frac{\text { NorthLeg }}{\text { Nog }}$ | 762 | 814 | 814 | 814 | 814 | 0.0\% | 0.0\% | 0.0\% | 0 | 762 | 762 | \% | 762 | 762 | Average of ifiference and Growh |  | 2035 model showed a decrease: 786 in |
|  | Out | 730 | 541 | 553 | 543 | 556 | 2.2\% | 0.1\% | 2.3\% | 13 | 743 | 747 | 1\% | 745 | 745 | Average of Difference and Growh |  |  |
| ${ }^{\text {DeltaE }}$ O | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Averace of ifference and Grown |  |  |
| Delta35 11 | Out | 780 | ${ }_{837}$ | ${ }_{837}^{699}$ | ${ }_{837}^{687}$ | ${ }_{837}$ | 0.0\% | 0.0\% | 0.0\% | 40 | ${ }_{780}$ | 780 | 0\% | ${ }_{780}$ | ${ }_{780}$ | Average of infiference and Gown |  | 2035 model showed a decrease: 821 out |
| 200 US 101 a M Milil Casino Entrance | East Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{1 N}$ | ${ }_{142}^{146}$ | 1 | 1 | 1 | 1 | 0.0\% | ${ }^{0.0 \% \%}$ | ${ }^{0.0 \%}$ | 0 | ${ }_{142}^{146}$ | 146 4 | 0\% | 146 142 | ${ }_{148}^{146}$ | Average of Differerce and Growh | Assumed no growt in link volumes |  |
|  | Westleg | 142 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% |  | 142 | 142 | 0\% | 142 | 142 | Average of Difference and Gowh | Assumed no growt in inink volumes |  |
|  | ${ }_{0}^{1 N}$ | ${ }_{4}^{17}$ | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 17 | ${ }^{17}$ | 0\% | 17 | 17 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Average of Difference and Growh | Assumed no growth ilink volumes |  |


| Existing Year Project Forecast Year Model Base Year Model Forecast Year | $\begin{aligned} & 2017 \\ & 2040 \\ & 2013 \\ & 2035 \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  | Sidestreets not included in the regional model <br> Greater than $10 \%$ difference between difference and growth methods <br> Numbers adjusted from model to work with spreadsheet ( 0 growth $=1$ ) |  |  | USE DIFFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Model | ssignment |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Entersection |  | $\begin{aligned} & \text { Exxsing } \\ & \text { sotv } \end{aligned}$ | Maselne | Feture kef | Model | Model | ${ }_{\substack{2013.2035 \\ \text { Compar }}}$ | son | ${ }_{\substack{2017.20}}^{\text {Comp }}$ | arison |  | ost Process ture 2040 N | $\begin{aligned} & \text { sed Volumes } \\ & \text { No Build Yea } \end{aligned}$ |  |  |  |  |  |
|  | Direction | 2017 | 2013 | 2035 | 2017 | 2040 | Total Grown | Annual Growth | $\begin{aligned} & \text { Total } \\ & \text { Growth } \end{aligned}$ | $\begin{aligned} & \text { Volume } \\ & \text { Difference } \end{aligned}$ | Volume Difference | Volume Growth | Percent Difference | Average | $\left\|\begin{array}{c} \text { Forecast } \\ \text { Used } \end{array}\right\|$ | Method Used | Comments | Additional Comments |
|  | Noort Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 786 <br> 920 | ${ }_{6}^{753}$ | 885 764 | 770 688 | $\begin{aligned} & 866 \\ & 786 \end{aligned}$ | ${ }^{122 \%}$ | 0.6\% 0.6 | 12.5\% | ${ }_{99}^{96}$ | 882 1019 | ${ }^{884} 1053$ | 0\% | 883 <br> 1036 | 883 1036 | Average of ifiference and Growh |  |  |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  | 3\% |  |  |  |  |  |
|  | iN | ${ }^{962}$ | 669 | 764 | 686 | ${ }^{786}$ | 14.2\% | 0.6\% | 14.5\% | 99 | 1061 | 1101 | 4\% | 1081 | 1081 | Average of Difference and Growh |  |  |
|  | Out | 845 | 753 | 845 | 770 | 866 | 122\% | 0.6\% | 12.5\% | 96 | 941 | 951 | 1\% | 946 | 946 | Averge of Difference and Growh |  |  |
| \|ewnark Avenue at oak Street | EastLeg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | iN | 965 | 833 | ${ }^{836}$ | 834 | 837 | 0.4\% | 0.0\% | 0.4\% | 3 | 968 | 969 | 0\% | 988 | 968 | Average of Difference and Growh |  |  |
|  | Out | 990 | 847 | 863 | 850 | 867 | 1.9\% | 0.1\% | 2.0\% | 17 | 1007 | 1009 | 0\% | 1008 | 1008 | Average of Difference and Growh |  |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\frac{10}{\text { Out }}$ | 1000 970 | ${ }_{888}^{982}$ | $\stackrel{1007}{872}$ | ${ }_{889} 88$ | ${ }_{873}^{1013}$ | 2.5\% ${ }^{\text {0.5\% }}$ | ${ }^{0.0 \%}$ | 2.5\% | ${ }_{4}^{26}$ | $\stackrel{1026}{974}$ | ${ }_{9}^{1026}$ | 0\% | ${ }^{1026} 9$ | ${ }^{1026} 9$ | Average of Difference and Growh |  |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{10}$ | 115 | 81 | 84 | 82 | 85 | 3.7\% | 0.2\% | 3.8\% | 3 | 118 | 119 | 1\% | 119 | 119 | Average of Difference and Growh |  |  |
|  | Out | 120 | 181 | 191 | 183 | 193 | 5.5\% | 0.3\% | 5.7\% | 10 | 130 | 127 | 3\% | 129 | 129 | Average of Difference a ad Growh |  |  |
|  | South Leg |  |  |  | \#DVV0! | \#Divol |  | \#Divo! |  |  |  |  |  |  |  |  |  |  |
|  | Out | 0 |  |  | \#DVV0! | \#DIV0! | \#DIVO! | \#DIVO! | \#DIV0! | \#DIV0! | \#DIV0! | \#DIVO! | \#DIVO! | \#DIV0! |  |  |  |  |
|  | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | N | 580 | 193 | 306 | 214 | 332 | 58.5\% | 2.7\% | 55.3\% | 118 | 698 | 901 | 25\% | 800 | 698 | Difference Method | Absolute ifference $10 \% \rightarrow$ Used difference only |  |
|  | Out | 630 | 236 | 24 | 237 | ${ }^{246}$ | 3.4\% | $0.2 \%$ | 3.5\% | 8 | 638 | 652 | ${ }^{2 \%}$ | 645 | 638 | Difference Method | TT be consisient with metho d used foro oposing direction |  |
|  | Westl Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\stackrel{\text { IN }}{\text { Out }}$ | $\stackrel{1015}{560}$ | 821 296 | 834 <br> 295 | 823 298 | ${ }_{295}^{837}$ | - ${ }^{1.6 \%}$ | ${ }^{0.0 \% \%}$ | - $1.7 \%$ | $\stackrel{14}{14}$ | 1029 559 | $\stackrel{1032}{558}$ | 0\% | 1030 <br> 558 | ${ }_{\substack{1030 \\ 588}}$ | Average of Difference and Growh |  |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 10 | 370 | 390 | 367 | 386 | 362 | .5.9\% | -0.3\% | 6.2\% | ${ }^{24}$ | 346 | 347 | 0\% | 346 | 346 | Average of Difference and Growh |  | 2035 model showed a decrease: 367 in |
|  | Out | 830 | 680 | 723 | 688 | 733 | 6.3\% | 0.3\% | 6.5\% | 45 | 875 | 884 | 1\% | 880 | 880 | Average of Difference and Growh |  |  |
|  | South Leg | 525 | 455 | ${ }^{376}$ | 441 | 358 | -174\% | -0.8\% | -18.7\% | . 83 | 442 | 427 | 4\% |  |  | Averase of Difference and Growh |  |  |
|  | Out | 470 | 648 | 621 | 643 | 615 | -4.2\% | -0.2\% | 4.4\% | -28 | 442 | 449 | 2\% | 446 | ${ }_{446}$ | Average of Difference e and Growh |  | 2235 model showed a decrease: 621 out |
| \|eewnak Stree a t Edgeenood Dive | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 580 | ${ }^{135}$ | ${ }^{249}$ | ${ }^{156}$ | 275 | ${ }^{84.4 \%}$ | 3.8\% | 76.5\% | 119 | 699 | 1024 | 38\% | 862 | 699 | Difference Method | Absolute difference $10 \%$ - Used difference only |  |
|  | Out | 646 | 169 | 178 | 171 | 180 | 5.3\% | 0.2\% | 5.5\% | 9 | 655 | 682 | 4\% | 669 | 655 | Difference Method | To be consisient with method Used toro oposing direction |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ion |  |
|  | Out | ${ }_{5}^{654}$ | ${ }_{193}^{293}$ | ${ }_{306}^{244}$ | ${ }^{2314}$ | ${ }_{332}^{24}$ | ${ }^{\text {54.5\%\% }}$ | ${ }^{2.7 \%}$ | -35\% ${ }^{\text {53\% }}$ | ${ }_{118}^{818}$ | ${ }_{692}^{638}$ | ${ }_{892} 6$ | ${ }^{25 \%}$ | ${ }_{792} 7$ | ${ }_{692}^{638}$ |  |  |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\frac{10}{\text { Out }}$ | 0 |  |  | $\underset{\substack{\text { \#Divol } \\ \text { \#Divo! }}}{ }$ | \#ivivol \#Divol | $\underset{\text { \# }}{\substack{\text { \#Divo! } \\ \text { \#Divo! }}}$ | \#DIVO! \#DVV: | $\begin{array}{\|l\|l\|} \hline \text { \#Divivol } \\ \text { \#DIVio! } \end{array}$ | \#DIVo! \#DIV0! | \#Divo! \#DIV0! | \#DVVO! \#DVIV: | \#DV: \#Divo! | \#Divo! \#Divo: |  |  |  |  |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | iN | 65 | ${ }^{64}$ | 63 | 64 | ${ }^{63}$ | -1.6\% | -0.1\% | -1.6\% | ${ }^{-1}$ | 64 | 64 | 0\% | 64 | 64 | Average of Difference and Growh |  |  |
|  | Out | 55 | 73 | 72 | 73 | 72 | -1.4\% | -0.1\% | -1.4\% | 1 | ${ }_{5} 5$ | 54 | \% | 54 | 54 | Average of Difference and Growh |  |  |
| \|eewnak Avenue at Busslls Street | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\frac{\mathbb{I N}}{\frac{\text { Out }}{}}$ | 610 630 | ${ }_{1}^{137}$ | ${ }_{128}^{260}$ | ${ }^{159}$ | ${ }^{288}$ | 89.8\% | $4.1 \%$ <br> $0.2 \%$ | ${ }^{80.7 \%}$ | ${ }^{129}$ | ${ }_{7}^{739}$ | ${ }_{162}^{102}$ | 40\% | ${ }_{920} 6$ | ${ }_{639} 7$ | Difference Method | Absolute difference $10 \% \rightarrow$ Used difference only |  |
|  |  | 630 | 122 | 128 | ${ }^{123}$ | 129 | 4.9\% | 0.2\% | 5.1\% | 6 | 636 | 662 | 4\% | 649 | 636 | Difference Method | To be consisisent with methoo used for opposing direction |  |
|  | \% | 640 | 211 | ${ }^{220}$ | ${ }^{213}$ | 222 | 4.3\% | 0.2\% | 4.4\% | 9 | 649 | 668 | 3\% | 659 | 649 | Difference Method | To be consisient with metho used foro oposing direction |  |
|  | Out | 580 | 181 | 302 | 203 | 330 | 66.9\% | 3.0\% | 623\% | ${ }^{127}$ | 707 | ${ }^{941}$ | 29\% | 824 | 707 | Difference Method | Absolute difference $10 \%$ - U Used difference only |  |
|  | Noth Leg | ${ }^{135}$ | 74 | ${ }^{75}$ | 74 | 75 | 1.4\%/ | 0.1\% | 1.4\% | 1 | ${ }^{136}$ | ${ }^{137}$ | 1\% | ${ }^{136}$ | 136 | Average of Difference and Growh |  |  |
|  | Out | 180 | 119 | 125 | 120 | 126 | 5.0\% | 0.2\% | 5.2\% | 6 | 186 | 189 | 2\% | 188 | 188 | Average of Difference end Growh |  |  |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\frac{10}{\text { Out }}$ | $\frac{20}{15}$ | 1 | $\frac{1}{1}$ | $\frac{1}{1}$ | $\frac{1}{1}$ | 0.0\% | 0.0\%\% | 0.0\% | 0 | $\frac{20}{15}$ | $\frac{20}{15}$ | \%\% | $\frac{20}{15}$ | ${ }_{15}^{20}$ | Average of Difierence and Growh | Assumed no goowt in link volumes |  |
| Newnak Street a S Sheman Avenue | East Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\mathrm{IN}^{\text {a }}$ | 395 | 240 | 388 | 267 | ${ }_{4} 22$ | 61.7\% | 2.8\% | 58.0\% | ${ }_{155}$ | 550 | 624 | 13\% | 587 | 550 | Difference Method | Absolute difference $>10 \%-$ Used difference only |  |
|  | Out | 471 | 209 | ${ }^{221}$ | 211 | ${ }^{224}$ | 5.7\% | 0.3\% | 5.9\% | ${ }^{13}$ | 484 | 499 | 3\% | 491 | 484 | Difference Method | To be consisient with method used foro oposing direction |  |
|  | West Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{10}$ | ${ }_{6}^{608}$ | ${ }_{1}^{138}$ | ${ }^{122}$ | ${ }_{116}^{116}$ | ${ }^{124}$ | ${ }_{6}^{6.1 \%}$ | 0.3\% | 6.3\% | 7 | ${ }_{7}^{615}$ | 646 <br> 1088 | 5\% | ${ }_{931}^{639}$ | ${ }_{731}^{615}$ | Difference Method | To be consisient witmeethod used for opposing direction |  |
|  | North Leg | 600 |  | 263 | 161 | 291 |  | 4.1\% |  | 131 |  |  |  |  |  | Difference Method | Absolute difference $10 \% \ldots$ Ssed difference only |  |
|  | ${ }^{10}$ | 186 | 69 | 73 | 70 | 74 | 5.8\% | 0.3\% | 6.0\% | 4 | 190 | 197 | 4\% | 194 | 194 | Average of Difference and Growh |  |  |
|  | $\frac{\text { Out }}{\text { Sout } \mathrm{Leg}}$ | 205 | 90 | 104 | 93 | 107 | 15.6\% | 0.7\% | 15.8\% | 15 | 220 | 237 | 8\% | 229 | 229 | Average of Difference and Growh |  |  |
|  | IN | 312 | ${ }_{158}$ | ${ }^{158}$ | ${ }_{158}$ | 158 | 0.0\% | 0.0\% | 0.0\% | 0 | 312 | 312 | \% | 312 | 312 | Average of Difference and Growh |  | 2035 model showed a decrease: 151 in |
|  | Out | 225 | 145 | 147 | 145 | 147 | 1.4\% | 0.1\% | 1.4\% | 2 | 227 | 228 | 1\% | 228 | 228 | Average of Difference and Growh |  |  |
| $\underbrace{260} \underbrace{\text { 20, }}$ US 101 a t Newmark Street | EastLeg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 10 | 12 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | ${ }^{12}$ | ${ }^{12}$ | \%\% | 12 | ${ }^{12}$ | Average of Difference and Growh | Assumed no growt in inin volumes |  |
|  | Out | 3 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 3 | 3 | 0\% | 3 | 3 | Average of Difference and Growh | Assumed no growt in link volumes |  |
|  | Westleg | 491 | 209 | ${ }^{221}$ | 211 | ${ }^{224}$ | 5.7\% | 0.3\% | 5.9\% | 13 | 504 | 520 | 3\% | 512 | 504 | Difference Method | To be consisient with metho used foro oposing direction |  |
|  | Out | 405 | 240 | 388 | 267 | 422 | 617\% | 2.8\% | 58.0\% | 155 | 560 | 640 | 13\% | 600 | 560 | Difference Method | Absolute ifference $>10 \% \rightarrow$ Used difference only |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{10}$ | 876 | ${ }^{798}$ | 891 | ${ }^{815}$ | 912 | ${ }^{117.7 \%}$ | 0.5\% | ${ }^{11.95 \%}$ | ${ }^{97}$ | ${ }^{973}$ | ${ }^{981}$ | 1\% | 977 | 977 | Average of Difference and Growh |  |  |
|  | South Leg | 980 | 127 | 825 | 745 | 847 | 13.5\% | 0.6\% | 13.8\% | 102 | 1082 | 1115 | 3\% | 1099 | 1099 | Average of Difference and Growh |  |  |
|  | ${ }^{10}$ | 1121 | 722 | 973 | 768 | 1030 | 34.8\% | 1.6\% | 34.2\% | 262 | 1383 | 1504 | 8\% | 1444 | 1383 | Difference Method | Absolute difference $10 \%$ - $\rightarrow$ Used difference only |  |
|  | Out | 1112 | 763 | 871 | 783 | 896 | 14.2\% | 0.6\% | 14.4\% | 113 | 1225 | 1272 | 4\% | 1249 | 1225 | Difference Method | To be consisient with metho d used tor opposing direction |  |


| Existing Year Project Forecast Year Model Base Year Model Forecast Year | $\begin{aligned} & 2017 \\ & 2004 \\ & 2043 \\ & 2035 \\ & 2035 \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  | Sidestreets not included in the regional model Greater than $10 \%$ difference between difference and growth methods Numbers adjusted from model to work with spreadsheet ( 0 growth $=1$ ) |  |  | USE DIFFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Model | ssignment |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | $\begin{gathered} \text { Exxsting } \\ \text { 30HVV } \end{gathered}$ | Baseline Basel Mode | $\begin{gathered} \text { Future Rer } \\ \text { Model } \end{gathered}$ | $\begin{aligned} & \text { niterpopataed } \\ & \text { Model } \end{aligned}$ | Forecasted Model | 2013-2035 Compar | Mon | ${ }_{\substack{2017-200 \\ \text { Comp }}}$ | - F Mrodel |  | stricess ture 2040 N | ssed Volumes No Build Yea |  |  |  |  |  |
| Intersection <br> Morrison Street at Lakeshore Drive | Direction | 2017 | 2013 | 2035 | 2017 | 2040 | Total Growth | $\begin{array}{\|c} \hline \text { Anual } \\ \text { Growth } \end{array}$ | $\begin{gathered} \text { Total } \\ \hline \text { Trowth } \end{gathered}$ | $\begin{array}{\|l\|l\|l\|l\|l\|l\|} \hline \text { Difference } \end{array}$ | $\begin{array}{\|c\|c\|} \hline \text { Volume } \\ \hline \text { Difference } \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \text { Vocoue } \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline \text { Percent } \\ \text { Pifference } \end{array}$ | Average | $\left.\begin{array}{\|c} \text { Forecast } \\ \text { Used } \end{array} \right\rvert\,$ | Method Used | Comments | Additional Comments |
|  | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 95 | 97 | ${ }^{111}$ | 100 | 114 | 14.4\% | 0.7\% | 14.7\% | 15 | 110 | 109 | 1\% | 109 | 109 | Average of Difference and Growh |  |  |
|  | Out | 145 | 156 | 181 | 161 | 187 | 16.0\% | 0.7\% | 16.3\% | 26 | 171 | 169 | 1\% | 170 | 170 | Average of Difference and Gowh |  |  |
|  | West Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{1 /}$ | 51 | $\stackrel{41}{48}$ | $\stackrel{47}{53}$ | $\stackrel{42}{49}$ | $\stackrel{48}{48}$ | ${ }^{14.6 \%}$ | ${ }^{0.7 \% \%}$ | 14.9\%\% | 6 | ${ }_{6}^{57}$ | $\stackrel{59}{66}$ | ${ }_{2}^{2 \%}$ | ${ }_{6}^{58}$ | ${ }_{6}^{58}$ | Averase of Difierence and Growh |  |  |
|  | $\frac{\text { Nout }}{\text { Northeg }}$ | 60 | 48 | ${ }_{5}$ | 49 | 54 | 10.4\% | 0.5\% | 10.7\% | 5 | 65 | 66 | 2\% | 66 | 66 | Average of Difference and Growth |  |  |
|  | is | 0 |  |  | \#Divo! | \#Divo! | \#Divo! | \#Divoi | \#Divol | \#DVV0! | \#Divo! | \#Divo: | \#Divo: | \#Divo: |  |  |  |  |
|  | Out | 0 |  |  | \#Divo! | \#Divo! | \#Divo! | \#oivo! | \#Divo: | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#Divo: |  |  |  |  |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 100 41 | ${ }_{4}^{115}$ | $\stackrel{134}{58}$ | $\frac{118}{51}$ | ${ }_{60}^{138}$ | 16.5\% | 0.8\% |  | 20 | ${ }^{120}$ | 117 | 3\% | ${ }_{1}^{118}$ | 118 50 | Averace of Difference and Growh |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Eastleg | 400 | 645 | 662 | ${ }^{648}$ | 666 | 2.6\% | 0.1\% | 2.7\% | 18 | 418 | 411 | 2\% | 414 | 414 | Average of Difference and Growh |  |  |
|  | Oit | 430 | 351 | 367 | 354 | 371 | 4.6\% | 0.2\% | 4.7\% | 17 | 447 | 450 | 1\% | 449 | 449 | Average of Difference e and Grown |  |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\mathbb{N}^{1}$ | 7 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 7 | 7 | \% | 7 | 7 | Average of ifference and Growh | Assumed no growt in link volumes |  |
|  | Out | 16 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 16 | 16 | 0\% | 16 | 16 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  | NorthLeg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Out | 7 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 7 | 7 | \% | 7 | 7 | Average of Difiference and Growh | Assumed no goowniminkvolumes |  |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | ${ }_{326} 28$ | ${ }^{351}$ | ${ }^{367}$ | 354 | 371 | 4.6\% | 0.2\% | 4.7\% | 17 | 443 | ${ }^{466}$ | 1\% | 444 | 444 | Average of Difference and Growh |  |  |
|  | Out | 388 | 645 | 662 | 648 | 666 | 2.6\% | 0.1\% | 2.7\% | 18 | 406 | 399 | 2\% | 402 | 402 | Averge of Difference and Growh |  |  |
| ${ }^{\text {Newnak Avenue at Morison Street }}$ | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{10}$ | ${ }_{7} 895$ | $\stackrel{929}{ }{ }_{5}$ | ${ }_{593}^{964}$ | ${ }_{5}^{935}$ | ${ }_{6} 92$ | ${ }^{3.8 \%}$ | ${ }^{0.2 \%}$ | ${ }^{3.9 \%}$ | ${ }_{38}^{37}$ | ${ }_{798}^{938}$ | ${ }_{8}^{930}$ | 0\% | ${ }_{801}^{931}$ | ${ }_{804}^{931}$ | Average of Difference and Growh |  |  |
|  | Out | 760 | 557 | 593 | 564 | 601 | 6.5\% | 0.3\% | 6.7\% | 38 | 798 | 811 | 2\% | 804 | 804 | Averge of Difference and Growh |  |  |
|  | West Leg |  | 526 | 545 | 529 | 549 |  | 0.2\% |  |  |  | 664 |  | 662 | 662 | Averase of Difference and Growh |  |  |
|  | Oit | 742 | 867 | 897 | 872 | 904 | ${ }^{3.5 \%}$ | 0.2\% | 3.6\% | 31 | 773 | 769 | 1\% | 771 | 771 | Average of Difference e and Growh |  |  |
|  | North Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | iN | 8 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 8 | 8 | \% | 8 | 8 | Average of Difference and Growh | Assumed no growth in link volumes |  |
|  | Out | 11 | 1 | 1 | 1 | 1 | 0.0\% | 0.0\% | 0.0\% | 0 | 11 | 11 | 0\% | ${ }^{11}$ | 11 | Average of Difference and Growh | Assumed no growt in inin volumes |  |
|  | $\frac{\text { Sout Leg }}{\mathbb{N}}$ | 161 | ${ }^{35}$ | ${ }^{54}$ | ${ }^{38}$ | ${ }^{58}$ | 54.3\% | 25\% | 51.7\% | ${ }^{20}$ | 181 | ${ }^{244}$ | 30\% | ${ }^{213}$ | 181 | Difference Method | Absolute difference $710 \%$ - S sed diference o only $^{\text {a }}$ |  |
|  | Out | 191 | 65 | 72 | 66 | 74 | 10.8\% | 0.5\% | 11.\% | 7 | 198 | 212 | 7\% | 205 | 198 | Difference Method | To be consisienen with metho used for opposing direction |  |
| $\left.\right\|^{\text {Newnak Averue at Occan Boulverd }}$ | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }^{1 / 2}$ | ${ }_{5}^{59}$ | ${ }_{5}^{728}$ | ${ }_{5}^{728}$ | ${ }_{5}^{728}$ | ${ }_{5}^{728}$ | 0.0\% | 0.0\% | 0.0\% | 0 | 597 | 591 558 | 0\% |  |  | Average of Difference and Growth |  | 2035 model showed a decrease: 721 in |
|  | $\frac{\text { Out }}{\text { Westleg }}$ | 530 | 510 | 536 | 515 | 542 | 5.1\% | 0.2\% | 5.3\% | ${ }^{27}$ | 557 | 558 | 0\% | 558 | 558 | Average of Difference and Growth |  |  |
|  | Westleg | 725 | 662 | 699 | 669 | 707 | 5.6\% | 0.3\% | 5.8\% | 39 | 764 | 767 | 0\% | 765 | 765 | Average of Difference and Growh |  |  |
|  | out | 960 | 1189 | ${ }_{1238}$ | 1198 | 1249 | 4.1\% | 0.2\% | 4.3\% | 51 | 1011 | 1001 | 1\% | 1006 | 1006 | Average of Difierence end Growh |  |  |
|  | North Leg |  |  |  | \#Divol | \#Divo! | \#Divo! | \#Divo! | \#DIVO! | \#Divo! |  |  |  |  |  |  |  |  |
|  | IN | 0 |  |  | \#Divo! | \#Divo! | \#Divo! | \#Divo! | \#DIVO! | \#Divo! | \#DVO)! | \#DIVO! | \#Divo! | \#DVV)! |  |  |  |  |
|  | South Leq |  |  |  | +ivor | \#ilvo | +ivor | \#ivo | movio. | \#ivo? | \#uno |  | \#\#No. | \#ivo |  |  |  |  |
|  | $\underline{10}$ | ${ }^{420}$ | 522 | 589 | 534 | 604 | 12.8\% | 0.6\% | 13.1\% | 70 | 490 | 475 | 3\% | 483 | 483 | Average of Difference and Growh |  |  |
|  | Out | 246 | 213 | 236 | 217 | 241 | 10.8\% | 0.5\% | 11.1\% | 24 | 270 | 273 | 1\% | 272 | 272 | Average of Difference and Growh |  |  |
| Newnak Avenue a Llaclir Street | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }_{\text {IN }}^{\text {Not }}$ | ${ }_{7}^{735}$ | ${ }_{6}^{909}$ | ${ }_{695}^{99}$ | ${ }_{6}^{910}$ | ${ }_{7}^{914}$ | 0.4\% | 0.0\% | 年.5\% | 22 | ${ }_{757}^{749}$ | ${ }_{7}^{748}$ | \%\% | ${ }_{758}^{749}$ | ${ }_{7}^{749}$ | Average of Difierence and Growh |  |  |
|  | $\frac{\text { West }}{\text { Out }}$ | 735 | 674 | 695 | 678 | 700 | 3.1\% | 0.1\% | 3.2\% | 22 | 757 | 759 | 0\% | 758 | 758 | Average of Difference and Growh |  |  |
|  | in | 630 | 580 | 599 | 583 | 603 | 3.3\% | 0.1\% | 3.4\% | 20 | 650 | 651 | 0\% | 651 | 651 | Average of Difference and Growh |  |  |
|  | Out | 715 | 793 | 801 | ${ }^{794}$ | 803 | 1.0\% | 0.0\% | 1.1\% | 8 | ${ }^{723}$ | 723 | 0\% | ${ }^{723}$ | 723 | Average of Difference and Growh |  |  |
|  | Noort Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\xrightarrow{10}$ | 0 |  |  | \#\#Divo! | \#Divo! | \#Divo! | \#oblvo | \#obvo! | \#Divo! | \#Divo! | \#Divo! | \#IVIVO! | \#Divo! | - |  |  |  |
|  | South Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | ${ }^{145}$ | ${ }^{175}$ | ${ }^{175}$ | ${ }^{175}$ | ${ }^{175}$ | 0.0\% | 0.0\% | 0.0\% | 0 | ${ }^{145}$ | 145 | \% | 145 | ${ }^{145}$ | Average of Difference and Growh |  |  |
|  | Out | 70 | 197 | 197 | 197 | 197 | 0.0\% | 0.0\% | 0.0\% | 0 | 70 | 70 | 0\% | 70 | 70 | Average of Difference and Growh |  |  |
| Empire Builevard at Pactic Avenue | Eastleg |  |  |  |  |  |  |  |  |  | 44 |  |  |  |  |  |  |  |
|  | Out | 45 | 7 | 10 | 8 | 11 | 4.2.\% | ${ }^{1.9 \%}$ | 4.6\% | 3 | 48 | 64 | 28\% | ${ }_{56}$ | 48 | Difference Method | Absolute ifference |  |
|  | Westleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ¢ | 0 |  |  | $\underset{\text { \#oivo! }}{\text { \# }}$ | $\underset{\substack{\text { \#Divo! } \\ \text { \#DiVo! }}}{ }$ | \#Divo! \#\#VV0! | \#oivoi \#Divoi | \#Divo! | $\underset{\substack{\text { \#Divo! } \\ \text { \#DVOO! }}}{ }$ | $\underset{\text { \#Divo! }}{\text { \#DVO! }}$ | $\pm \begin{aligned} & \text { \#Divo: } \\ & \text { \#DVOO! }\end{aligned}$ | \#\#ivo! $\#$ DIVO! | \#Divo: \#DVO0! |  |  |  |  |
|  | Nooth Leg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | IN | 380 127 | 661 | 678 | ${ }^{664}$ | 632 | 2.6\% | 0.1\% | 2.7\% | 18 | 398 | 390 | 2\% | 394 | 394 | Average of Difference and Growh |  |  |
|  | $\frac{\text { Out }}{\text { South Leg }}$ | ${ }^{427}$ | 362 | 380 | 365 | ${ }^{384}$ | 5.0\% | 0.2\% | 5.2\% | 19 | 446 | 449 | 1\% | 447 | 447 | Average of Difference and Growh |  |  |
|  | IN | 465 | 370 | 390 | 374 | 395 | 5.4\% | 0.2\% | 5.6\% | 21 | 486 | 491 | 1\% | 488 | 488 | Average of Difference and Gowh |  |  |
|  | Out | 410 | 678 | 702 | 682 | 707 | 3.5\% | 0.2\% | 3.7\% | 25 | 435 | 425 | 2\% | 430 | 430 | Average of Difference and Growh |  |  |
| 1070 Thompson Road at Woodand Dive | Eastleg |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\stackrel{\text { IN }}{\substack{\text { Out }}}$ | ${ }_{146}^{230}$ | ${ }_{2}^{248}$ | ${ }_{2}^{248}$ | 248 272 | ${ }_{2}^{248}$ | 0.0\% | 0.0\% 0 | 0.0\% | 0 | ${ }_{146}^{230}$ | ${ }_{146}^{230}$ | 0\% | ${ }_{146}^{230}$ | 230 146 | Average of Difference and Growh |  | ${ }_{2}^{20335 \text { model showed adecrease: } 247 \mathrm{in}}$ |
|  | West Leg | 146 | 212 | 212 | 212 | 272 | 0.0\% | 0.0\% | 0.0\% |  | 146 |  | 0\% |  |  |  |  | 2035 model showed adecrease: 265 out |
|  | IN | 0 |  |  | \#Divol | \#Diviv! | \#diviv! | \#Diviv! | \#Divo! | \#divo! | \#divo! | \#Divo: | \#Divo! | \#divo: |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multirow[t]{3}{*}{Existing Year Project Forecast Year Model Base Year Model Forecast Year} \& \multirow[t]{3}{*}{$$
\begin{aligned}
& 2017 \\
& 2004 \\
& \begin{array}{l}
2017 \\
2013 \\
2035
\end{array}
\end{aligned}
$$} \& \& \& \& \& \& \& \& \& \& \& \& \& \& \multicolumn{3}{|r|}{Sidestreets not included in the regional model Greater than $10 \%$ difference between difiference and growth methods Numbers a dussted from model to work with spreadsheet ( 0 growith $=1$ )} \& \multirow[t]{2}{*}{USE DIFFERENCE} <br>
\hline \& \& \& \& Model \& Assignment \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \& $$
\begin{array}{|c}
\hline \text { Exxsting } \\
30 \mathrm{HV}
\end{array}
$$ \& Baselline
Model \& Future Ref Model \& Tinerpopalated
Model \&  \& $$
\begin{gathered}
2013.20357 \\
\text { Comparit }
\end{gathered}
$$ \& ison \& ${ }_{\substack{2017-20}}^{\text {Comp }}$ \& $$
\begin{aligned}
& 40 \mathrm{Momoded} \\
& \text { parison }
\end{aligned}
$$ \& \& st Proces \& sed Volum No Build Y \& \& \& \& \& <br>
\hline \multirow[t]{11}{*}{Commercial Avenue at US 101 South

0} \& Direction \& 2017 \& 2013 \& 2035 \& 2017 \& 2040 \& Total Growh \& $$
\begin{array}{|c}
\substack{\text { Annual } \\
\text { Growth }}
\end{array}
$$ \& \[

$$
\begin{aligned}
& \text { Totalt } \\
& \text { Growth }
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|l|l|l|l|l|l|l|l|l|l|l|l|l|}
\hline \text { Diferen }
\end{array}
$$

\] \& \[

$$
\begin{gathered}
\text { Voluturence } \\
\hline \text { Differe }
\end{gathered}
$$

\] \& \[

$$
\begin{array}{|l} 
\\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& \text { Perccent } \\
& \text { Difference }
\end{aligned}
$$
\] \& Average \& Forecast \& Method Used \& Comments \& Additional Comments <br>

\hline \& East Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& N \& 330 \& 488 \& 488 \& 488 \& 488 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 330 \& ${ }^{330}$ \& 0\% \& 330 \& 330 \& Average of ifiference and Growh \& \& 2035 model showed a decrease: 477 in <br>
\hline \& Out \& 0 \& \& \& \#Divo! \& \#Divol \& \#Divo! \& \#Divo! \& \#Divol \& \#Divo! \& \#obvo! \& \#Divo! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \& Westleg \& 0 \& \& \& \#Divol \& \#Divo! \& \& \& \#Divo! \& \& \& \#DVVO \& \& \#DIVOO \& \& \& \& <br>
\hline \& Out \& 385 \& 567 \& 569 \& ${ }_{567}$ \& ${ }_{569}$ \& ${ }^{\text {0.4\% }}$ \& 0.0\% \& 0.4\% \& ${ }^{2}$ \& ${ }_{387}$ \& ${ }_{3}^{486}$ \& 0\% \& ${ }_{387} 3$ \& 387 \& Average of Difference and Growh \& \& <br>
\hline \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& ${ }^{10}$ \& 1315 \& 815 \& 939 \& 838 \& 967 \& 15.2\% \& 0.7\% \& 15.5\% \& ${ }_{130} 130$ \& 1445 \& 1519 \& 5\% \& 1482 \& 1482 \& Average of ifference a and Growh \& \& <br>
\hline \& Out \& 0 \& \& \& \#oivo! \& \#Divo! \& \#oivo! \& \#Divo! \& \#bivo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \& South Leg \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DV0! \& \#Divo! \& \#Divo! \& \#DV0! \& \#Divo: \& \& \& \& <br>
\hline \& Out \& 1260 \& 736 \& 847 \& ${ }^{756}$ \& 872 \& 15.1\% \& 0.7\% \& 15.3\% \& 116 \& ${ }_{1} 1376$ \& ${ }_{1} 1453$ \& 5\% \& 1415 \& 1415 \& Average of ifiference and Growh \& \& <br>
\hline \multirow[t]{10}{*}{$\left.\right|^{\text {Commercial Avenue at US } 101 \text { North }}$} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& 1 N \& 0 \& \& \& \#Divol \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divio! \& \#Divol \& \#oivo! \& \#ovve! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \& Out \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo: \& \& \& \& <br>
\hline \& Westleg \& 0 \& \& \& \#DV0! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DVV0! \& \#Divo! \& \#oivo! \& \#DV0! \& \#DIVO! \& \& \& \& <br>
\hline \& Out \& 280 \& 488 \& 488 \& 488 \& 488 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 280 \& 280 \& 0\% \& 280 \& 280 \& Average of Difference and Growh \& \& 2035 model showed a decrease: 477 out <br>
\hline \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& ${ }^{10}$ \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo: \& \#Divo! \& \#Divo! \& \#IVIVO! \& \#Divo! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \&  \& 1120 \& 810 \& 1072 \& 858 \& 1132 \& 323\% \& 1.5\% \& 319\% \& 274 \& 1394 \& 1478 \& 6\% \& 1436 \& 1436 \& Average of Difference and Growh \& \& <br>
\hline \& $\mathbb{N}^{\text {c }}$ \& 1400 \& 1299 \& 1549 \& 1344 \& 1600 \& 19.2\% \& 0.9\% \& 19.4\% \& 261 \& 1661 \& 1672 \& 1\% \& 1667 \& 1667 \& Average of ifiference and Growh \& \& <br>
\hline \& Out \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DVV0! \& \#DVV0! \& \#Divo! \& \#Divo! \& \#Divo! \& \& \& \& <br>
\hline \multirow[t]{10}{*}{100t Street a C Central Avenue} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& IN \& ${ }^{435}$ \& ${ }^{636}$ \& ${ }^{636}$ \& ${ }^{636}$ \& ${ }^{636}$ \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& ${ }^{435}$ \& ${ }^{435}$ \& 0\% \& 435 \& ${ }_{4}^{435}$ \& Average of Difference and Growth \& \& 2035 model showed adecrease: 630 in <br>
\hline \& Out \& 670 \& 601 \& 634 \& 607 \& 642 \& 5.5\% \& 0.2\% \& 5.7\% \& 35 \& 705 \& 708 \& 1\% \& 706 \& 706 \& Average of Difference and Growth \& \& <br>
\hline \& Westleg \& \& \& \& 801 \& \& \& \& \& \& 671 \& 667 \& \& 669 \& 669 \& Average of Difference and Growh \& \& <br>
\hline \& Out \& 600 \& 803 \& 830 \& 808 \& ${ }_{836}$ \& 3.4\% \& 0.2\% \& 3.5\% \& ${ }_{28} 8$ \& 628 \& 621 \& 1\% \& 625 \& 625 \& Average of Difference and Growth \& \& <br>
\hline \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& iv \& 230 \& 114 \& 114 \& 114 \& 114 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& ${ }^{230}$ \& 230 \& \% \& 230 \& ${ }^{230}$ \& Difference Method \& Absolut difference $110 \% \rightarrow$ Used difference only \& 2035 model showeda decrease: 95 in <br>
\hline \& Sout \& 125 \& 148 \& 153 \& 149 \& 154 \& 3.4\% \& 0.2\% \& 3.5\% \& 5 \& 130 \& 129 \& 1\% \& 130 \& \& Difierence Method \& To be consisient with methoo used for orpososing drection \& <br>
\hline \& IN \& 275 \& 336 \& 390 \& ${ }^{346}$ \& 402 \& 16.1\% \& 0.7\% \& 16.3\% \& 56 \& 331 \& 320 \& 4\% \& 326 \& 326 \& Average of Difference and Gowh \& \& <br>
\hline \& Out \& 195 \& 331 \& 331 \& 331 \& 331 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 195 \& 195 \& 0\% \& 195 \& 195 \& Average of Difference and Growh \& \& 2035 model showed a decrease: 315 out <br>
\hline \multirow[t]{9}{*}{$\underbrace{\text { Central Avenue a at } 7 \text { It Steet }}$} \& Eastleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& IN \& 40 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& ${ }^{0.0 \%}$ \& 0.0\% \& 0 \& ${ }^{40}$ \& 40 \& 0\% \& 40 \& ${ }^{40}$ \& Average of ififernce and Growh \& Assumed no growh in link volumes \& <br>
\hline \& $\frac{\text { Out }}{\text { Westleg }}$ \& 0 \& 1 \& 1 \& 1 \& 1 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 0 \& 0 \& \#DVVo! \& 0 \& 0 \& Average of Difference and Growh \& Assumed no growt in link volumes \& <br>
\hline \& IN \& 660 \& 542 \& 576 \& 548 \& 584 \& 6.3\% \& 0.3\% \& 6.5\% \& 36 \& 696 \& 703 \& 1\% \& 699 \& 699 \& Average of ifiference and Growh \& \& <br>
\hline \& Out \& 440 \& 590 \& 590 \& 590 \& 590 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 440 \& 440 \& \% \& 440 \& 440 \& Average of Difference and Growh \& \& 2035 model showed a decrease: 565 out <br>
\hline \& Nochth Leg $_{\text {N }}$ \& 480 \& 590 \& 590 \& 590 \& 590 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 480 \& 480 \& 0\% \& 480 \& 480 \& Average of Difference and Growh \& \& 2035 model showed adecrease 565 in <br>
\hline \& Oit \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DIVO! \& \#Divo! \& \#Divo! \& \#Divo: \& \& \& \& 2035 moders stowed a becrease.josin <br>
\hline \& South Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& IN \& 0 \& \& \& \#Divo! \& \#oivol \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#oivo! \& \#Divo! \& \#Divol \& \#Divo! \& \& \& \& <br>
\hline \multirow[t]{10}{*}{7th Stret at Anderson Avenue} \& \& \& \& \& 548 \& 584 \& 6.3\% \& 0.3\% \& 6.9\% \& 36 \& 76 \& 180 \& ${ }^{2 \%}$ \& 78 \& \& Averageornienceandiom \& \& <br>
\hline \& ${ }_{\text {ctea }}$ \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DIV0! \& \#oivo! \& \#Divo! \& \#DIVO! \& \& \& \& <br>
\hline \& Out \& 665 \& 569 \& 603 \& 575 \& 611 \& 6.0\% \& 0.3\% \& 6.2\% \& 36 \& 701 \& 706 \& 1\% \& 703 \& 703 \& Average of Difference and Growh \& \& <br>
\hline \& Westleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& $\frac{10}{\text { Out }}$ \& $\stackrel{80}{105}$ \& $\frac{16}{1}$ \& $\frac{15}{1}$ \& $\frac{16}{1}$ \& $\frac{15}{1}$ \& -6.3\% \& - \& -6.6\% \& $\stackrel{-1}{0}$ \& $\stackrel{79}{105}$ \& ${ }^{75}$ \& 6\% \& $\stackrel{77}{105}$ \& ${ }_{17}^{705}$ \& Average of Difference and Growh \& \& <br>
\hline \& North Leg \& 105 \& 1 \& 1 \& 1 \& \& 0.0\% \& \& 0.0\% \& 0 \& \& \& \& \& \& \& \& <br>
\hline \& iv \& 740 \& 542 \& 576 \& 548 \& 584 \& 6.3\% \& 0.3\% \& 6.5\% \& 36 \& 776 \& 788 \& 2\% \& 782 \& 782 \& Average of ifference a and Growh \& \& <br>
\hline \&  \& 0 \& \& \& \#ivivo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#bivo! \& \#ivivo! \& \#bivo! \& \#Divo! \& \#oivoi! \& \#Divo! \& \& \& \& <br>
\hline \& IN \& 95 \& 14 \& 15 \& 14 \& 15 \& 7.1\% \& 0.3\% \& 7.4\% \& 1 \& 96 \& 102 \& 6\% \& 99 \& 99 \& Average of ifference and Growh \& \& <br>
\hline \& Out \& 145 \& 3 \& 3 \& 3 \& 3 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 145 \& 145 \& 0\% \& 145 \& 145 \& Average of Difference and Growth \& \& <br>
\hline \multirow[t]{9}{*}{Erod Avenue at 10th Steet} \& EastLeg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& ${ }^{1}$ \& ${ }^{140}$ \& ${ }_{2} 265$ \& ${ }^{302}$ \& 272 \& 310 \& 14.0\% \& 0.6\% \& 14.2\% \& 39 \& ${ }^{179}$ \& ${ }^{160}$ \& ${ }^{11 \%}$ \& 169 \& ${ }^{179}$ \& Difierence Method \& Absolut difference $10 \% \rightarrow$ Used difference only \& <br>
\hline \& West Leg \& \& 209 \& 209 \& \& 209 \& 0.0\% \& 0.0\% \& 0.0\% \& 0 \& 60 \& \& 0\% \& \& \& \& Absolut difference $10 \% \rightarrow$ Used difference only \& 2035 model showed a decrease: 1919 out <br>
\hline \& iN \& 75 \& 76 \& 100 \& 80 \& 105 \& 31.6\% \& 1.4\% \& 31.2\% \& 25 \& 100 \& 98 \& 2\% \& 99 \& 99 \& Average of Difference and Growh \& \& <br>
\hline \& Out \& 125 \& 88 \& 97 \& 90 \& 99 \& 10.2\% \& 0.5\% \& 10.5\% \& 9 \& 134 \& 138 \& 3\% \& 136 \& 136 \& Average of Difference and Growh \& \& <br>
\hline \& North Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& ${ }_{\text {Out }}$ \& ${ }_{185}^{185}$ \& ${ }_{334}^{291}$ \& $\stackrel{291}{394}$ \& ${ }_{345}^{291}$ \& $\stackrel{291}{408}$ \& -0.0\% \& 0.0.8\% \& ${ }^{0.0 \%} 18.2 \%$ \& ${ }_{6} 6$ \& $\stackrel{155}{248}$ \& ${ }^{155}$ \& ${ }_{\text {en }}^{\text {0\% }}$ \& ${ }_{2}^{155}$ \& ${ }_{248}^{155}$ \&  \& To be consistent with method used for opposing direction \& 2035 model showed adecrease: 280 in <br>
\hline \& South Leg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& \% \& 0 \& \& \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divol \& \#Divo! \& \#Divo! \& \#Divo! \& \#Divo! \& \#DIVO! \& \& \& \& <br>
\hline \multirow[t]{5}{*}{$200{ }^{111 t}$ Street at I Igessoll Avenue} \& \& 0 \& \& \& \#Divor \& \#bivo. \& \#Divo! \& \#bio. \& \#olvo! \& Ablo \& +ivo. \& \#bive \& \% \& \#Divo. \& \& \& \& <br>
\hline \& ${ }_{\text {cleg }}$ \& ${ }^{65}$ \& ${ }^{28}$ \& ${ }^{29}$ \& ${ }^{28}$ \& 29 \& 3.6\% \& 0.2\% \& 3.7\% \& \& ${ }^{66}$ \& 67 \& 2\% \& 67 \& 67 \& Average of ifiference and Growh \& \& <br>
\hline \& Out \& 96 \& 31 \& ${ }^{33}$ \& 31 \& 33 \& 6.5\% \& 0.3\% \& 6.7\% \& 2 \& 98 \& 102 \& 4\% \& 100 \& 100 \& Average of Difference and Growh \& \& <br>
\hline \& Westleg \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& \& <br>
\hline \& $\stackrel{\text { IN }}{\text { Out }}$ \& 3 \& ${ }_{32}^{20}$ \& ${ }_{35}^{27}$ \& ${ }_{33}^{21}$ \& ${ }_{36}^{29}$ \& 35.0\% \& 1.6\% \& 9.4.6\% \& ${ }_{3}^{7}$ \& 10
10 \& ${ }_{8}^{4}$ \& 88\% \& 7 \& ${ }_{10}^{10}$ \& Difference Method \& Absolue difierence $\mathrm{P} 10 \% \rightarrow$ S Sed difierence onl \& <br>
\hline
\end{tabular}




## Appendix D

Synchro Worksheets





c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 213 | 0 | - | 0 | 340 | 202 |
| Stage 1 | - | - | - | - | 202 | - |
| Stage 2 | - | - | - | - | 138 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1369 | - | - | - | 660 | 844 |
| Stage 1 | - | - | - | - | 837 | - |
| Stage 2 | - | - | - | - | 894 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1369 | - | - | - | 657 | 844 |
| Mov Cap-2 Maneuver | - | - | - | - | 657 | - |
| Stage 1 | - | - | - | - | 833 | - |
| Stage 2 | - | - | - | - | 894 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 0.3 |  | 0 |  | 10.2 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT | WBT | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1369 | - | - | - | 701 |
| HCM Lane V/C Ratio |  | 0.004 | - | - | - | 0.011 |
| HCM Control Delay (s) |  | 7.6 | 0 | - | - | 10.2 |
| HCM Lane LOS |  | A | A | - | - | B |
| HCM 95th \%tile Q(veh) |  | 0 | - | - | - | 0 |


| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |  |
| Lane Configurations | ${ }^{7}$ | $\hat{\beta}$ |  | \% | $\hat{\beta}$ |  |  | ${ }_{\$}$ |  |  | \$ |  |  |
| Traffic Vol, veh/h | 5 | 185 | 15 | 45 | 290 | 15 | 35 | 10 | 30 | 10 | 20 | 2 |  |
| Future Vol, veh/h | 5 | 185 | 15 | 45 | 290 | 15 | 35 | 10 | 30 | 10 | 20 | 2 |  |
| Conflicting Peds, \#/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 |  |
| Sign Control F | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |  |
| RT Channelized | - | - | None | - | - | None | - | - | None | - |  | None |  |
| Storage Length | 40 | - | - | 100 | - | - | - | - | - | - | - | - |  |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |  |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |  |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |  |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| Mvmt Flow | 5 | 201 | 16 | 49 | 315 | 16 | 38 | 11 | 33 | 11 | 22 | 2 |  |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | - | 0 | - | 0 | 655 | 401 |
| Stage 1 | - | - | - | - | 400 | - |
| Stage 2 | - | - | - | - | 255 | - |
| Critical Hdwy | - | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 0 | - | - | - | 434 | 653 |
| Stage 1 | 0 | - | - | - | 681 | - |
| Stage 2 | 0 | - | - | - | 792 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | - | - | - | - | 429 | 649 |
| Mov Cap-2 Maneuver | - | - | - | - | 525 | - |
| Stage 1 | - | - | - | - | 677 | - |
| Stage 2 | - | - | - | - | 787 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 0 |  | 0 |  | 14.1 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBT WBT WBRSBLn1 |  |  |  |  |
| Capacity (veh/h) |  | - | - | - | 576 |  |
| HCM Lane V/C Ratio |  | - | - |  | 0.314 |  |
| HCM Control Delay (s) |  | - | - | - | 14.1 |  |
| HCM Lane LOS |  | - | - | - | B |  |
| HCM 95th \%tile Q(veh) |  | - | - | - | 1.3 |  |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{7}$ | 中 ${ }^{\text {a }}$ |  | \％ | 个t |  |  | $\uparrow$ | 「 | ${ }^{7}$ | $\hat{1}$ |  |
| Traffic Volume（vph） | 20 | 315 | 120 | 395 | 320 | 10 | 170 | 40 | 410 | 45 | 45 | 15 |
| Future Volume（vph） | 20 | 315 | 120 | 395 | 320 | 10 | 170 | 40 | 410 | 45 | 45 | 15 |
| Ideal Flow（vphpl） | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time（s） | 4.0 | 4.0 |  | 4.0 | 4.0 |  |  | 4.0 | 5.0 | 4.0 | 4.0 |  |
| Lane Util．Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frpb，ped／bikes | 1.00 | 0.99 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Flpb，ped／bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.96 |  | 1.00 | 1.00 |  |  | 1.00 | 0.85 | 1.00 | 0.96 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.96 | 1.00 | 0.95 | 1.00 |  |
| Satd．Flow（prot） | 1662 | 3163 |  | 1646 | 3306 |  |  | 1676 | 1473 | 1662 | 1677 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.72 | 1.00 | 0.49 | 1.00 |  |
| Satd．Flow（perm） | 1662 | 3163 |  | 1646 | 3306 |  |  | 1261 | 1473 | 855 | 1677 |  |
| Peak－hour factor，PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj．Flow（vph） | 22 | 339 | 129 | 425 | 344 | 11 | 183 | 43 | 441 | 48 | 48 | 16 |
| RTOR Reduction（vph） | 0 | 36 | 0 | 0 | 2 | 0 | 0 | 0 | 72 | 0 | 10 | 0 |
| Lane Group Flow（vph） | 22 | 432 | 0 | 425 | 353 | 0 | 0 | 226 | 369 | 48 | 54 | 0 |
| Confl．Peds．（\＃／hr） | 7 |  | 8 | 8 |  | 7 | 5 |  |  |  |  | 5 |
| Heavy Vehicles（\％） | 0\％ | 0\％ | 1\％ | 1\％ | 0\％ | 0\％ | 0\％ | 0\％ | 1\％ | 0\％ | 0\％ | 0\％ |
| Turn Type | Split | NA |  | Split | NA |  | Perm | NA | pt＋ov | Perm | NA |  |
| Protected Phases | 2 | 2 |  | 6 | 6 |  |  | 8 | 86 |  | 4 |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | 4 |  |  |
| Actuated Green，G（s） | 15.3 | 15.3 |  | 24.9 | 24.9 |  |  | 17.1 | 47.5 | 17.1 | 17.1 |  |
| Effective Green， g （s） | 15.8 | 15.8 |  | 26.4 | 26.4 |  |  | 18.1 | 42.0 | 18.1 | 18.1 |  |
| Actuated g／C Ratio | 0.22 | 0.22 |  | 0.37 | 0.37 |  |  | 0.25 | 0.58 | 0.25 | 0.25 |  |
| Clearance Time（s） | 4.5 | 4.5 |  | 5.5 | 5.5 |  |  | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension（s） | 2.5 | 2.5 |  | 2.5 | 2.5 |  |  | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap（vph） | 363 | 691 |  | 601 | 1207 |  |  | 315 | 855 | 214 | 419 |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Prot | 0.01 | c0．14 |  | c0．26 | 0.11 |  |  |  | 0.25 |  | 0.03 |  |
| v／s Ratio Perm |  |  |  |  |  |  |  | c0．18 |  | 0.06 |  |  |
| v／c Ratio | 0.06 | 0.63 |  | 0.71 | 0.29 |  |  | 0.72 | 0.43 | 0.22 | 0.13 |  |
| Uniform Delay，d1 | 22.4 | 25.6 |  | 19.6 | 16.3 |  |  | 24.8 | 8.5 | 21.5 | 21.0 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Incremental Delay，d2 | 0.1 | 1.5 |  | 3.5 | 0.1 |  |  | 7.1 | 0.3 | 0.4 | 0.1 |  |
| Delay（s） | 22.4 | 27.1 |  | 23.2 | 16.4 |  |  | 31.9 | 8.7 | 21.9 | 21.1 |  |
| Level of Service | C | C |  | C | B |  |  | C | A | C | C |  |
| Approach Delay（s） |  | 26.9 |  |  | 20.1 |  |  | 16.6 |  |  | 21.4 |  |
| Approach LOS |  | C |  |  | C |  |  | B |  |  | C |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 20.6 |  | HCM 2000 | Level of | ervice |  | C |  |  |  |
| HCM 2000 Control Delay to Capacity ratio |  |  | 0.72 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length（s） |  |  | 72.3 |  | Sum of los | time（s） |  |  | 14.5 |  |  |  |
| Intersection Capacity Utilization |  |  | 68．8\％ |  | CU Level | f Service |  |  | C |  |  |  |
| Analysis Period（min） |  |  | 15 |  |  |  |  |  |  |  |  |  |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | ${ }^{7}$ | 中 ${ }^{\text {a }}$ |  | ${ }^{*}$ | $\uparrow$ |  | ${ }^{*}$ | $\hat{\beta}$ |  |
| Traffic Volume (vph) | 1 | 770 | 50 | 115 | 735 | 1 | 80 | 1 | 115 | 1 | 1 | 1 |
| Future Volume (vph) | 1 | 770 | 50 | 115 | 735 | 1 | 80 | 1 | 115 | 1 | 1 | 1 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.98 |  | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 0.99 | 1.00 |  | 0.99 | 1.00 |  |
| Frt | 1.00 | 0.99 |  | 1.00 | 1.00 |  | 1.00 | 0.85 |  | 1.00 | 0.93 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 3264 |  | 1646 | 3228 |  | 1602 | 1462 |  | 1653 | 1603 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.76 | 1.00 |  | 0.68 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 3264 |  | 1646 | 3228 |  | 1276 | 1462 |  | 1177 | 1603 |  |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 1 | 828 | 54 | 124 | 790 | 1 | 86 | 1 | 124 | 1 | 1 | 1 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 105 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 1 | 878 | 0 | 124 | 791 | 0 | 86 | 20 | 0 | 1 | 1 | 0 |
| Confl. Peds. (\#/hr) |  |  |  |  |  | 7 | 9 |  | 8 | 8 |  | 9 |
| Heavy Vehicles (\%) | 0\% | 1\% | 0\% | 1\% | 3\% | 0\% | 3\% | 0\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | Prot | NA |  | Prot | NA |  | Perm | NA |  | Perm | NA |  |
| Protected Phases | 5 | 2 |  | 1 | 6 |  |  | 8 |  |  | 4 |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | 4 |  |  |
| Actuated Green, G (s) | 0.4 | 31.3 |  | 7.7 | 38.6 |  | 8.5 | 8.5 |  | 8.5 | 8.5 |  |
| Effective Green, g (s) | 1.4 | 32.3 |  | 8.7 | 39.6 |  | 9.5 | 9.5 |  | 9.5 | 9.5 |  |
| Actuated g/C Ratio | 0.02 | 0.52 |  | 0.14 | 0.63 |  | 0.15 | 0.15 |  | 0.15 | 0.15 |  |
| Clearance Time (s) | 5.0 | 5.0 |  | 5.0 | 5.0 |  | 5.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 2.5 | 6.1 |  | 2.5 | 6.1 |  | 2.5 | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap (vph) | 37 | 1686 |  | 229 | 2045 |  | 193 | 222 |  | 178 | 243 |  |
| v/s Ratio Prot | 0.00 | c0.27 |  | c0.08 | 0.25 |  |  | 0.01 |  |  | 0.00 |  |
| v/s Ratio Perm |  |  |  |  |  |  | c0.07 |  |  | 0.00 |  |  |
| v/c Ratio | 0.03 | 0.52 |  | 0.54 | 0.39 |  | 0.45 | 0.09 |  | 0.01 | 0.00 |  |
| Uniform Delay, d1 | 29.9 | 10.0 |  | 25.0 | 5.6 |  | 24.1 | 22.8 |  | 22.5 | 22.5 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.2 | 0.7 |  | 2.1 | 0.4 |  | 1.2 | 0.1 |  | 0.0 | 0.0 |  |
| Delay (s) | 30.1 | 10.7 |  | 27.1 | 5.9 |  | 25.3 | 22.9 |  | 22.5 | 22.5 |  |
| Level of Service | C | B |  | C | A |  | C | C |  | C | C |  |
| Approach Delay (s) |  | 10.8 |  |  | 8.8 |  |  | 23.9 |  |  | 22.5 |  |
| Approach LOS |  | B |  |  | A |  |  | C |  |  | C |  |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 11.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.51 |  | 12.0 |
| Actuated Cycle Length (s) | 62.5 | Sum of lost time (s) | A |
| Intersection Capacity Utilization | $54.6 \%$ | ICU Level of Service |  |
| Analysis Period (min) | 15 |  |  |

c Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 4.9 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | * 4 |  |  | 个 ${ }^{\text {F }}$ |  |  | \$ |  |  | \& |  |
| Traffic Vol, veh/h | 270 | 565 | 0 | 0 | 770 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Future Vol, veh/h | 270 | 565 | 0 | 0 | 770 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Conflicting Peds, \#/hr | 10 | 0 | 11 | 11 | 0 | 10 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 297 | 621 | 0 | 0 | 846 | 16 | 5 | 1 | 16 | 5 | 0 | 121 |




C Critical Lane Group

c Critical Lane Group



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 2.1 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | K |  |  | - | 个 |  |
| Traffic Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Future Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Conflicting Peds, \#/hr | 0 | 0 | 4 | 0 | 0 | 4 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 38 | 32 | 38 | 192 | 167 | 51 |



| Intersection |  |
| :--- | ---: | :--- |
| Intersection Delay, s/veh | 8.1 |
| Intersection LOS | A |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | ¢ |  |  | ¢ |  |  | ${ }_{*}$ |  |  | ${ }_{*}$ |  |
| Traffic Vol, veh/h | 5 | 35 | 30 | 5 | 80 | 10 | 40 | 60 | 5 | 5 | 60 | 5 |
| Future Vol, veh/h | 5 | 35 | 30 | 5 | 80 | 10 | 40 | 60 | 5 | 5 | 60 | 5 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 6 | 41 | 35 | 6 | 93 | 12 | 47 | 70 | 6 | 6 | 70 | 6 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Right | NB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.7 |  |  | 8.1 |  |  | 8.3 |  |  | 8 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $38 \%$ | $7 \%$ | $5 \%$ | $7 \%$ |
| Vol Tru, \% | $57 \%$ | $50 \%$ | $84 \%$ | $86 \%$ |
| Vol Right, \% | $5 \%$ | $43 \%$ | $11 \%$ | $7 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 105 | 70 | 95 | 70 |
| LT Vol | 40 | 5 | 5 | 5 |
| Through Vol | 60 | 35 | 80 | 60 |
| RT Vol | 5 | 30 | 10 | 5 |
| Lane Flow Rate | 122 | 81 | 110 | 81 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.152 | 0.096 | 0.135 | 0.1 |
| Departure Headway (Hd) | 4.47 | 4.249 | 4.404 | 4.44 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 805 | 845 | 815 | 808 |
| Service Time | 2.486 | 2.268 | 2.422 | 2.459 |
| HCM Lane V/C Ratio | 0.152 | 0.096 | 0.135 | 0.1 |
| HCM Control Delay | 8.3 | 7.7 | 8.1 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.5 | 0.3 | 0.5 | 0.3 |


c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 1.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | \& |  |  | * |  | ${ }^{7}$ | 44 |  | ${ }^{1}$ | 44 |  |
| Traffic Vol, veh/h | 10 | 1 | 30 | 5 | 2 | 5 | 65 | 730 | 5 | 2 | 745 | 10 |
| Future Vol, veh/h | 10 | 1 | 30 | 5 | 2 | 5 | 65 | 730 | 5 | 2 | 745 | 10 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 8 | 0 | 2 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 100 | - | - | 100 | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Mvmt Flow | 11 | 1 | 34 | 6 | 2 | 6 | 74 | 830 | 6 | 2 | 847 | 11 |



c Critical Lane Group


c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 1.1 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | 㦃 |  |  | $\mathbf{- 1} 4$ | MF |  |
| Traffic Vol, veh/h | 610 | 30 | 30 | 670 | 20 | 45 |
| Future Vol, veh/h | 610 | 30 | 30 | 670 | 20 | 45 |
| Conflicting Peds, \#/hr | 0 | 2 | 2 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 663 | 33 | 33 | 728 | 22 | 49 |


| Major/Minor | Major1 |  | Major2 |  | Minor1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 0 | 0 | 698 | 0 | 1112 | 350 |
| Stage 1 | - | - | - | - | 682 | - |
| Stage 2 | - | - | - | - | 430 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 908 | - | 206 | 652 |
| Stage 1 | - | - | - | - | 469 | - |
| Stage 2 | - | - | - | - | 629 | - |
| Platoon blocked, \% | - | - |  | - |  |  |
| Mov Cap-1 Maneuver | - | - | 906 | - | 193 | 651 |
| Mov Cap-2 Maneuver | - | - | - | - | 193 | - |
| Stage 1 | - | - | - | - | 439 | - |
| Stage 2 | - | - | - | - | 629 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | NB |  |
| HCM Control Delay, s | 0 |  | 0.7 |  | 16.8 |  |
| HCM LOS |  |  |  |  | C |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBLn1 | EBT | EBR | WBL | WBT |
| Capacity (veh/h) |  | 376 | - | - | 906 | - |
| HCM Lane V/C Ratio |  | 0.188 | - | - | 0.036 | - |
| HCM Control Delay (s) |  | 16.8 | - | - | 9.1 | 0.3 |
| HCM Lane LOS |  | C | - | - | A | A |
| HCM 95th \%tile Q(veh) |  | 0.7 | - | - | 0.1 | - |


c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 7 | $\uparrow$ | 「 | ${ }^{7}$ | F |  | ${ }^{7}$ | F |  | ${ }^{7}$ | F |  |
| Trafic Volume (vph) | 65 | 435 | 125 | 15 | 495 | 40 | 160 | 125 | 35 | 20 | 95 | 80 |
| Future Volume (vph) | 65 | 435 | 125 | 15 | 495 | 40 | 160 | 125 | 35 | 20 | 95 | 80 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 |  | 1.00 | 0.97 |  | 1.00 | 0.93 |  |
| FIt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1750 | 1454 | 1662 | 1715 |  | 1662 | 1684 |  | 1662 | 1617 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1750 | 1454 | 1662 | 1715 |  | 1662 | 1684 |  | 1662 | 1617 |  |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 70 | 468 | 134 | 16 | 532 | 43 | 172 | 134 | 38 | 22 | 102 | 86 |
| RTOR Reduction (vph) | 0 | 0 | 72 | 0 | 3 | 0 | 0 | 10 | 0 | 0 | 29 | 0 |
| Lane Group Flow (vph) | 70 | 468 | 62 | 16 | 572 | 0 | 172 | 162 | 0 | 22 | 159 | 0 |
| Confl. Peds. (\#/hr) |  |  | 1 | 1 |  |  | 4 |  | 1 | 1 |  | 4 |
| Heavy Vehicles (\%) | 0\% | 0\% | 0\% | 0\% | 1\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | Prot | NA | Perm | Prot | NA |  | Prot | NA |  | Prot | NA |  |
| Protected Phases | 5 | 2 |  | 1 | 6 |  | 3 | 8 |  | 7 | 4 |  |
| Permitted Phases |  |  | 2 |  |  |  |  |  |  |  |  |  |
| Actuated Green, G (s) | 5.4 | 41.0 | 41.0 | 1.1 | 36.7 |  | 13.1 | 28.2 |  | 1.8 | 16.9 |  |
| Effective Green, g (s) | 5.9 | 41.5 | 41.5 | 1.6 | 37.2 |  | 13.6 | 28.7 |  | 2.3 | 17.4 |  |
| Actuated g/C Ratio | 0.07 | 0.46 | 0.46 | 0.02 | 0.41 |  | 0.15 | 0.32 |  | 0.03 | 0.19 |  |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |  | 4.5 | 4.5 |  | 4.5 | 4.5 |  |
| Vehicle Extension (s) | 2.5 | 6.0 | 6.0 | 2.5 | 6.0 |  | 2.5 | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap (vph) | 108 | 806 | 669 | 29 | 708 |  | 250 | 536 |  | 42 | 312 |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Prot | c0.04 | 0.27 |  | 0.01 | c0.33 |  | c0.10 | 0.10 |  | 0.01 | c0.10 |  |
| v/s Ratio Perm |  |  | 0.04 |  |  |  |  |  |  |  |  |  |
| v/c Ratio | 0.65 | 0.58 | 0.09 | 0.55 | 0.81 |  | 0.69 | 0.30 |  | 0.52 | 0.51 |  |
| Uniform Delay, d1 | 41.1 | 17.9 | 13.7 | 43.9 | 23.3 |  | 36.2 | 23.2 |  | 43.4 | 32.5 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 11.2 | 2.0 | 0.2 | 16.9 | 8.0 |  | 7.0 | 0.2 |  | 8.7 | 1.0 |  |
| Delay (s) | 52.3 | 19.9 | 13.9 | 60.8 | 31.3 |  | 43.3 | 23.4 |  | 52.1 | 33.5 |  |
| Level of Service | D | B | B | E | C |  | D | C |  | D | C |  |


| Approach Delay (s) | 22.1 | 32.1 | 33.3 | 35.4 |
| :--- | ---: | ---: | ---: | ---: |
| Approach LOS | C | C | C | D |


| Intersection Summary |  |  | C |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 29.0 | HCM 2000 Level of Service |  |
| HCM 2000 Volume to Capacity ratio | 0.70 |  | 16.0 |
| Actuated Cycle Length (s) | 90.1 | Sum of lost time (s) | C |

C Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{*}$ | $\uparrow$ |  |  | \＄ |  | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | \％ | 个 $\uparrow$ | 「 |
| Traffic Volume（vph） | 165 | 1 | 340 | 2 | 5 | 5 | 460 | 930 | 1 | 1 | 885 | 95 |
| Future Volume（vph） | 165 | 1 | 340 | 2 | 5 | 5 | 460 | 930 | 1 | 1 | 885 | 95 |
| Ideal Flow（vphpl） | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time（s） | 5.0 | 4.0 |  |  | 3.5 |  | 4.0 | 4.0 |  | 4.0 | 4.0 | 5.5 |
| Lane Util．Factor | 1.00 | 1.00 |  |  | 1.00 |  | 1.00 | 0.95 |  | 1.00 | 0.95 | 1.00 |
| Frpb，ped／bikes | 1.00 | 1.00 |  |  | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 | 0.97 |
| Flpb，ped／bikes | 1.00 | 1.00 |  |  | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 |  |  | 0.94 |  | 1.00 | 1.00 |  | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 |  |  | 0.99 |  | 0.95 | 1.00 |  | 0.95 | 1.00 | 1.00 |
| Satd．Flow（prot） | 1646 | 1488 |  |  | 1638 |  | 1662 | 3259 |  | 1662 | 3228 | 1434 |
| Flt Permitted | 0.95 | 1.00 |  |  | 0.86 |  | 0.95 | 1.00 |  | 0.95 | 1.00 | 1.00 |
| Satd．Flow（perm） | 1646 | 1488 |  |  | 1427 |  | 1662 | 3259 |  | 1662 | 3228 | 1434 |
| Peak－hour factor，PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj．Flow（vph） | 168 | 1 | 347 | 2 | 5 | 5 | 469 | 949 | 1 | 1 | 903 | 97 |
| RTOR Reduction（vph） | 0 | 284 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| Lane Group Flow（vph） | 168 | 64 | 0 | 0 | 7 | 0 | 469 | 950 | 0 | 1 | 903 | 36 |
| Confl．Peds．（\＃／hr） |  |  |  |  |  |  | 3 |  |  |  |  | 3 |
| Heavy Vehicles（\％） | 1\％ | 0\％ | 0\％ | 0\％ | 0\％ | 0\％ | 0\％ | 2\％ | 0\％ | 0\％ | 3\％ | 1\％ |
| Turn Type | Prot | NA |  | custom | NA |  | Prot | NA |  | Prot | NA | Perm |
| Protected Phases | 3 |  |  |  |  |  | 1 | 6 |  | 5 | 2 |  |


| Permitted Phases |  | 8 | 4 |  |  |  |  | 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Actuated Green，G（s） | 12.0 | 18.2 | 1.7 | 33.1 | 71.3 | 0.5 | 38.7 | 38.7 |
| Effective Green， g （s） | 12.0 | 19.2 | 2.7 | 34.1 | 72.8 | 1.5 | 40.2 | 38.7 |
| Actuated g／C Ratio | 0.11 | 0.18 | 0.03 | 0.32 | 0.69 | 0.01 | 0.38 | 0.37 |
| Clearance Time（s） | 5.0 | 5.0 | 4.5 | 5.0 | 5.5 | 5.0 | 5.5 | 5.5 |
| Vehicle Extension（s） | 2.5 | 2.5 | 5.0 | 2.5 | 4.8 | 2.5 | 4.8 | 4.8 |
| Lane Grp Cap（vph） | 187 | 270 | 36 | 537 | 2248 | 23 | 1230 | 526 |
| v／s Ratio Prot | c0．10 |  |  | c0．28 | 0.29 | 0.00 | c0． 28 |  |
| v／s Ratio Perm |  | c0．04 | 0.00 |  |  |  |  | 0.02 |
| v／c Ratio | 0.90 | 0.24 | 0.20 | 0.87 | 0.42 | 0.04 | 0.73 | 0.07 |
| Uniform Delay，d1 | 46.1 | 36.9 | 50.3 | 33.7 | 7.2 | 51.3 | 28.1 | 21.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay，d2 | 38.1 | 0.3 | 5.6 | 14.5 | 0.3 | 0.6 | 2.7 | 0.1 |
| Delay（s） | 84.3 | 37.2 | 55.9 | 48.2 | 7.4 | 51.9 | 30.8 | 21.8 |
| Level of Service | F | D | E | D | A | D | C | C |
| Approach Delay（s） |  | 52.5 | 55.9 |  | 20.9 |  | 29.9 |  |
| Approach LOS |  | D | E |  | C |  | C |  |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 29.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 |  |  |
| Actuated Cycle Length（s） | 105.5 | Sum of lost time（s） | 17.5 |
| Intersection Capacity Utilization | $87.1 \%$ | ICU Level of Service | E |
| Analysis Period（min） | 15 |  |  |

C Critical Lane Group



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 5.2 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | $\uparrow$ |  |  | -1 | Y |  |
| Traffic Vol, veh/h | 55 | 1 | 50 | 60 | 5 | 115 |
| Future Vol, veh/h | 55 | 1 | 50 | 60 | 5 | 115 |
| Conflicting Peds, \#/hr | 0 | 2 | 2 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, \% | 2 | 0 | 0 | 2 | 0 | 0 |
| Mvmt Flow | 61 | 1 | 56 | 67 | 6 | 128 |


| Major/Minor M | Major1 |  | Major2 |  | Minor1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 0 | 0 | 64 | 0 | 243 | 64 |
| Stage 1 | - |  | - | - | 64 | - |
| Stage 2 | - | - | - | - | 179 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1551 | - | 750 | 1006 |
| Stage 1 | - | - | - | - | 964 | - |
| Stage 2 | - | - | - | - | 857 | - |
| Platoon blocked, \% | - | - |  | - |  |  |
| Mov Cap-1 Maneuver | - | - | 1548 | - | 720 | 1004 |
| Mov Cap-2 Maneuver | - | - | - | - | 720 | - |
| Stage 1 | - | - | - | - | 925 | - |
| Stage 2 | - | - | - | - | 857 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | NB |  |
| HCM Control Delay, s | 0 |  | 3.4 |  | 9.2 |  |
| HCM LOS |  |  |  |  | A |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBLn1 | EBT | EBR | WBL | WBT |
| Capacity (veh/h) |  | 988 | - | - | 1548 | - |
| HCM Lane V/C Ratio |  | 0.135 | - | - | 0.036 | - |
| HCM Control Delay (s) |  | 9.2 | - | - | 7.4 | 0 |
| HCM Lane LOS |  | A | - | - | A | A |
| HCM 95th \%tile Q(veh) |  | 0.5 | - | - | 0.1 | - |





C Critical Lane Group


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.9 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | F |  |  | -1 |
| Traffic Vol, veh/h | 40 | 2 | 445 | 45 | 5 | 390 |
| Future Vol, veh/h | 40 | 2 | 445 | 45 | 5 | 390 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 2 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 1 |
| Mvmt Flow | 43 | 2 | 473 | 48 | 5 | 415 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 924 | 499 | 0 | 0 | 523 | 0 |
| Stage 1 | 499 | - | - | - | - | - |
| Stage 2 | 425 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 302 | 576 | - | - | 1054 | - |
| Stage 1 | 614 | - | - | - | - | - |
| Stage 2 | 664 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 300 | 575 | - | - | 1052 | - |
| Mov Cap-2 Maneuver | 300 | - | - | - | - | - |
| Stage 1 | 609 | - | - | - | - | - |
| Stage 2 | 664 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 18.7 |  | 0 |  | 0.1 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRWBLn1 |  | SBL | SBT |
| Capacity (veh/h) |  | - | - | 307 | 1052 | - |
| HCM Lane V/C Ratio |  | - | - | 0.146 | 0.005 | - |
| HCM Control Delay (s) |  | - | - | 18.7 | 8.4 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 0.5 | 0 | - |




| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 6.4 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Mr |  |  | A | F |  |
| Traffic Vol, veh/h | 75 | 195 | 110 | 235 | 190 | 35 |
| Future Vol, veh/h | 75 | 195 | 110 | 235 | 190 | 35 |
| Conflicting Peds, \#/hr | 1 | 0 | 1 | 0 | 0 | 1 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | 60 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 82 | 214 | 121 | 258 | 209 | 38 |




|  | $\bigcirc$ | 4 |  |  |  | 1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |  |
| Lane Configurations | ${ }^{7}$ | 「 | $\uparrow$ |  | ${ }^{7}$ | 4 |  |
| Traffic Volume (vph) | 15 | 50 | 560 | 15 | 35 | 645 |  |
| Future Volume (vph) | 15 | 50 | 560 | 15 | 35 | 645 |  |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |  |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.85 | 1.00 |  | 1.00 | 1.00 |  |
| Flt Protected | 0.95 | 1.00 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1488 | 1727 |  | 1662 | 1733 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 |  | 0.37 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1488 | 1727 |  | 645 | 1733 |  |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |  |
| Adj. Flow (vph) | 18 | 59 | 659 | 18 | 41 | 759 |  |
| RTOR Reduction (vph) | 0 | 54 | 1 | 0 | 0 | 0 |  |
| Lane Group Flow (vph) | 18 | 5 | 676 | 0 | 41 | 759 |  |
| Heavy Vehicles (\%) | 0\% | 0\% | 1\% | 0\% | 0\% | 1\% |  |
| Turn Type | Prot | Perm | NA |  | Perm | NA |  |
| Protected Phases | 4 |  | 2 |  |  | 2 |  |
| Permitted Phases |  | 4 |  |  | 2 |  |  |
| Actuated Green, G (s) | 3.2 | 3.2 | 27.9 |  | 27.9 | 27.9 |  |
| Effective Green, g (s) | 3.2 | 3.2 | 28.9 |  | 28.9 | 28.9 |  |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.72 |  | 0.72 | 0.72 |  |
| Clearance Time (s) | 4.0 | 4.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 3.0 | 3.0 | 5.2 |  | 5.2 | 5.2 |  |
| Lane Grp Cap (vph) | 132 | 118 | 1244 |  | 464 | 1248 |  |
| v/s Ratio Prot | c0.01 |  | 0.39 |  |  | c0.44 |  |
| v/s Ratio Perm |  | 0.00 |  |  | 0.06 |  |  |
| v/c Ratio | 0.14 | 0.04 | 0.54 |  | 0.09 | 0.61 |  |
| Uniform Delay, d1 | 17.2 | 17.0 | 2.6 |  | 1.7 | 2.8 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.5 | 0.1 | 0.9 |  | 0.2 | 1.3 |  |
| Delay (s) | 17.6 | 17.2 | 3.5 |  | 1.9 | 4.1 |  |
| Level of Service | B | B | A |  | A | A |  |
| Approach Delay (s) | 17.3 |  | 3.5 |  |  | 4.0 |  |
| Approach LOS | B |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 4.4 |  | HCM 2000 | evel of Service | A |
| HCM 2000 Volume to Capacity ratio |  |  | 0.56 |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 40.1 |  | Sum of los | me (s) | 8.0 |
| Intersection Capacity Utilization |  |  | 47.7\% |  | CU Level | Service | A |
| Analysis Period (min) |  |  | 15 |  |  |  |  |
| C Critical Lane Group |  |  |  |  |  |  |  |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 5.4 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | $\uparrow$ |  |  | $\uparrow$ |
| Traffic Vol, veh/h | 40 | 130 | 190 | 30 | 180 | 200 |
| Future Vol, veh/h | 40 | 130 | 190 | 30 | 180 | 200 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 85 | 85 | 85 | 85 | 85 | 85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 47 | 153 | 224 | 35 | 212 | 235 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 901 | 242 | 0 | 0 | 259 | 0 |
| Stage 1 | 242 | - | - | - | - | - |
| Stage 2 | 659 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 |  | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 311 | 802 | - | - | 1317 | - |
| Stage 1 | 803 | - | - | - | - | - |
| Stage 2 | 518 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 253 | 802 | - | - | 1317 | - |
| Mov Cap-2 Maneuver | 253 | - | - | - | - | - |
| Stage 1 | 654 | - | - | - | - | - |
| Stage 2 | 518 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 15.8 |  | 0 |  | 3.9 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRV | VBLn1 | SBL |  |
| Capacity (veh/h) |  | - | - | 531 | 1317 | - |
| HCM Lane V/C Ratio |  | - | - | 0.377 | 0.161 | - |
| HCM Control Delay (s) |  | - | - | 15.8 | 8.3 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 1.7 | 0.6 | - |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.6 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | $\mathbf{T}$ | A | $\mathbf{-}$ |  |  |
| Traffic Vol, veh/h | 0 | 45 | 450 | 195 | 0 | 0 |
| Future Vol, veh/h | 0 | 45 | 450 | 195 | 0 | 0 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 0 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 16974 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 2 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 51 | 511 | 222 | 0 | 0 |


|  | Major2 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Major/Minor | Minor2 |  |  |  |
| Conflicting Flow All | - | 222 | 0 | 0 |
| $\quad$ Stage 1 | - | - | - | - |
| $\quad$ Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.22 | 4.1 | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | -3.318 | 2.2 | - |  |
| Pot Cap-1 Maneuver | 0 | 818 | - | - |
| $\quad$ Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, \% |  |  |  | - |
| Mov Cap-1 Maneuver | 0 | 818 | - | - |
| Mov Cap-2 Maneuver | 0 | - | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |


|  | EB | WB |  |
| :--- | ---: | ---: | :--- |
| Approach |  |  |  |
| HCM Control Delay, s | 9.7 |  |  |
| HCM LOS | A |  |  |
|  |  |  |  |
| Minor Lane/Major Mvmt | EBLn1 | WBL | WBT |
| Capacity (veh/h) | 818 | - | - |
| HCM Lane V/C Ratio | 0.063 | - | - |
| HCM Control Delay (s) | 9.7 | - | - |
| HCM Lane LOS | A | - | - |
| HCM 95th \%tile Q(veh) | 0.2 | - | - |


c Critical Lane Group

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |

c Critical Lane Group
Intersection
Intersection Delay, s/veh 8.4
Intersection LOS

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Lane Configurations |  | $\uparrow$ | $\uparrow$ |  | Fr |  |
| Traffic Vol, veh/h | 90 | 10 | 25 | 160 | 50 | 110 |
| Future Vol, veh/h | 90 | 10 | 25 | 160 | 50 | 110 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 106 | 12 | 29 | 188 | 59 | 129 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 |
| Approach | EB |  | WB |  | SB |  |
| Opposing Approach | WB | EB |  |  |  |  |
| Opposing Lanes | 1 |  | 1 | 0 |  |  |
| Conflicting Approach Left SB |  |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  | 0 | 1 |  |  |
| Conflicting Approach Right |  | SB | EB |  |  |  |
| Conflicting Lanes Right | 0 | 1 | 1 |  |  |  |
| HCM Control Delay | 8.6 | 8.2 | 8.5 |  |  |  |


| Lane | EBLn1WBLn1 SBLn1 |  |  |
| :--- | ---: | ---: | ---: |
| Vol Left, \% | $90 \%$ | $0 \%$ | $31 \%$ |
| Vol Thru, \% | $10 \%$ | $14 \%$ | $0 \%$ |
| Vol Right, \% | $0 \%$ | $86 \%$ | $69 \%$ |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 100 | 185 | 160 |
| LT Vol | 90 | 0 | 50 |
| Through Vol | 10 | 25 | 0 |
| RT Vol | 0 | 160 | 110 |
| Lane Flow Rate | 118 | 218 | 188 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.154 | 0.238 | 0.223 |
| Departure Headway (Hd) | 4.718 | 3.941 | 4.267 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 761 | 912 | 843 |
| Service Time | 2.742 | 1.961 | 2.288 |
| HCM Lane V/C Ratio | 0.155 | 0.239 | 0.223 |
| HCM Control Delay | 8.6 | 8.2 | 8.5 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.5 | 0.9 | 0.9 |

Intersection
Intersection Delay, s/veh 7.6 A
Intersection LOS A


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $17 \%$ | $45 \%$ | $7 \%$ | $88 \%$ |
| Vol Thru, \% | $50 \%$ | $9 \%$ | $7 \%$ | $10 \%$ |
| Vol Right, \% | $33 \%$ | $45 \%$ | $86 \%$ | $2 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 30 | 11 | 70 | 102 |
| LT Vol | 5 | 5 | 5 | 90 |
| Through Vol | 15 | 1 | 5 | 10 |
| RT Vol | 10 | 5 | 60 | 2 |
| Lane Flow Rate | 35 | 13 | 82 | 120 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.039 | 0.015 | 0.084 | 0.142 |
| Departure Headway (Hd) | 3.992 | 4.051 | 3.678 | 4.258 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 889 | 869 | 958 | 840 |
| Service Time | 2.051 | 2.145 | 1.763 | 2.292 |
| HCM Lane V/C Ratio | 0.039 | 0.015 | 0.086 | 0.143 |
| HCM Control Delay | 7.2 | 7.2 | 7.1 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0 | 0.3 | 0.5 |

Intersection

$\frac{\text { Intersection Delay, s/veh } 7.6}{}$| Intersection LOS A |
| :--- |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | ¢ |  |  | ¢ |  |  | $\uparrow$ |  |  | ¢ |  |
| Traffic Vol, veh/h | 5 | 15 | 5 | 1 | 10 | 5 | 20 | 65 | 5 | 5 | 80 | 10 |
| Future Vol, veh/h | 5 | 15 | 5 | 1 | 10 | 5 | 20 | 65 | 5 | 5 | 80 | 10 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| Mvmt Flow | 6 | 18 | 6 | 1 | 12 | 6 | 24 | 76 | 6 | 6 | 94 | 12 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Righ | hNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.5 |  |  | 7.3 |  |  | 7.7 |  |  | 7.6 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $22 \%$ | $20 \%$ | $6 \%$ | $5 \%$ |
| Vol Thru, \% | $72 \%$ | $60 \%$ | $62 \%$ | $84 \%$ |
| Vol Right, \% | $6 \%$ | $20 \%$ | $31 \%$ | $11 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 90 | 25 | 16 | 95 |
| LT Vol | 20 | 5 | 1 | 5 |
| Through Vol | 65 | 15 | 10 | 80 |
| RT Vol | 5 | 5 | 5 | 10 |
| Lane Flow Rate | 106 | 29 | 19 | 112 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.12 | 0.035 | 0.022 | 0.125 |
| Departure Headway (Hd) | 4.079 | 4.31 | 4.226 | 4.011 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 874 | 836 | 852 | 889 |
| Service Time | 2.13 | 2.31 | 2.227 | 2.061 |
| HCM Lane V/C Ratio | 0.121 | 0.035 | 0.022 | 0.126 |
| HCM Control Delay | 7.7 | 7.5 | 7.3 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.1 | 0.1 | 0.4 |



C Critical Lane Group



| Movement | EBT | EBR | EBR2 | WBL2 | WBL | WBT | SBL2 | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 中 ${ }^{\text {F }}$ |  |  |  | \# | 4 | ${ }^{*}$ | ${ }^{7} 1$ | $\uparrow$ |  |
| Traffic Volume (vph) | 175 | 55 | 5 | 175 | 15 | 100 | 285 | 1355 | 145 | 70 |
| Future Volume (vph) | 175 | 55 | 5 | 175 | 15 | 100 | 285 | 1355 | 145 | 70 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 |  |  |  | 4.5 | 4.0 | 4.0 | 4.0 | 5.5 |  |
| Lane Util. Factor | 0.95 |  |  |  | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 |  |
| Frpb, ped/bikes | 0.99 |  |  |  | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 |  |  |  | 0.99 | 1.00 | 0.99 | 1.00 | 1.00 |  |
| Frt | 0.96 |  |  |  | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 |  |
| Flt Protected | 1.00 |  |  |  | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 3141 |  |  |  | 1587 | 1750 | 1611 | 3225 | 1631 |  |
| Flt Permitted | 1.00 |  |  |  | 0.60 | 1.00 | 0.95 | 0.95 | 1.00 |  |
| Satd. Flow (perm) | 3141 |  |  |  | 997 | 1750 | 1611 | 3225 | 1631 |  |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 186 | 59 | 5 | 186 | 16 | 106 | 303 | 1441 | 154 | 74 |
| RTOR Reduction (vph) | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 248 | 0 | 0 | 0 | 202 | 106 | 303 | 1441 | 210 | 0 |
| Confl. Peds. (\#/hr) |  | 8 | 8 | 8 | 8 |  | 12 | 12 |  | 1 |
| Heavy Vehicles (\%) | 1\% | 0\% | 2\% | 2\% | 19\% | 0\% | 2\% | 0\% | 2\% | 0\% |
| Turn Type | NA |  |  | Perm | Perm | NA | Perm | Split | NA |  |
| Protected Phases | 8 |  |  |  |  | 4 |  | 2 | 2 |  |
| Permitted Phases |  |  |  | 4 | 4 |  | 2 |  |  |  |
| Actuated Green, G (s) | 19.1 |  |  |  | 19.1 | 19.1 | 40.9 | 40.9 | 40.9 |  |
| Effective Green, g (s) | 19.6 |  |  |  | 19.1 | 19.6 | 42.4 | 42.4 | 40.9 |  |
| Actuated g/C Ratio | 0.28 |  |  |  | 0.27 | 0.28 | 0.61 | 0.61 | 0.58 |  |
| Clearance Time (s) | 4.5 |  |  |  | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 |  |
| Vehicle Extension (s) | 2.5 |  |  |  | 2.5 | 2.5 | 6.1 | 6.1 | 6.1 |  |
| Lane Grp Cap (vph) | 879 |  |  |  | 272 | 490 | 975 | 1953 | 952 |  |
| v/s Ratio Prot | 0.08 |  |  |  |  | 0.06 |  | c0.45 | 0.13 |  |
| v/s Ratio Perm |  |  |  |  | c0.20 |  | 0.19 |  |  |  |
| v/c Ratio | 0.28 |  |  |  | 0.74 | 0.22 | 0.31 | 0.74 | 0.22 |  |
| Uniform Delay, d1 | 19.7 |  |  |  | 23.2 | 19.3 | 6.7 | 9.8 | 6.9 |  |
| Progression Factor | 1.00 |  |  |  | 0.30 | 0.24 | 1.14 | 1.31 | 1.05 |  |
| Incremental Delay, d2 | 0.1 |  |  |  | 8.9 | 0.1 | 0.7 | 2.2 | 0.5 |  |
| Delay (s) | 19.8 |  |  |  | 16.0 | 4.7 | 8.4 | 15.1 | 7.8 |  |
| Level of Service | B |  |  |  | B | A | A | B | A |  |
| Approach Delay (s) | 19.8 |  |  |  |  | 12.1 |  |  | 13.2 |  |
| Approach LOS | B |  |  |  |  | B |  |  | B |  |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 13.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.75 |  | 9.5 |
| Actuated Cycle Length (s) | 70.0 | Sum of lost time (s) | D |
| Intersection Capacity Utilization | $75.3 \%$ | ICU Level of Service |  |
| Analysis Period (min) | 15 |  |  |

c Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 1.5 |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  | $\uparrow$ | $\uparrow$ |  | F |  |
| Traffic Vol, veh/h | 50 | 265 | 355 | 5 | 5 | 55 |
| Future Vol, veh/h | 50 | 265 | 355 | 5 | 5 | 55 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | - | 0 | 0 | - | 0 | - |
| Grade, \% | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, \% | 0 | 2 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 57 | 305 | 408 | 6 | 6 | 63 |



|  |  | Intersection |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 2.3 |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ${ }^{7}$ | + | $\uparrow$ |  | * |  |
| Traffic Vol, veh/h | 35 | 200 | 110 | 5 | 5 | 70 |
| Future Vol, veh/h | 35 | 200 | 110 | 5 | 5 | 70 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control Fros | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length 1 | 140 | - | - | - | 0 | - |
| Veh in Median Storage, \# | \# | 0 | 0 | - | 0 | - |
| Grade, \% | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 84 | 84 | 84 | 84 | 84 | 84 |
| Heavy Vehicles, \% | 0 | 3 | 4 | 0 | 0 | 1 |
| Mvmt Flow | 42 | 238 | 131 | 6 | 6 | 83 |



| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay，s／veh | 0.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR |  |  |  |  |  |  |  |  |  |  |  |  |
| Lane Configurations |  | 个 |  |  |  |  |  |  |  |  | 个瑯 |  |
| Traffic Vol，veh／h | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 1040 | 15 |
| Future Vol，veh／h | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 1040 | 15 |
| Conflicting Peds，\＃／hr | 5 | 0 | 2 | 2 | 0 | 5 | 12 | 0 | 2 | 2 | 0 | 12 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | － | － | None | － | － | None | － | － | None | － | － | None |
| Storage Length | － | － | － | － | － | － | － | － | － | － | － | － |
| Veh in Median Storage，\＃ | \＃ | 0 | － |  | 16983 | － | － | 16983 | － | － | 0 | － |
| Grade，\％ | － | 0 | － | － | 0 | － | － | 0 | － | － | 0 | － |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles，\％ | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 1130 | 16 |











| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 0.7 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | 4 |  |  | \& |  |  | $\uparrow$ |  |  | 4 |  |
| Traffic Vol, veh/h | 1 | 120 | 10 | 2 | 55 | 1 | 5 | 1 | 1 | 1 | 2 | 1 |
| Future Vol, veh/h | 1 | 120 | 10 | 2 | 55 | 1 | 5 | 1 | 1 | 1 | 2 | 1 |
| Conflicting Peds, \#/hr | 3 | 0 | 3 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control Fr | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 1 | 160 | 13 | 3 | 73 | 1 | 7 | 1 | 1 | 1 | 3 | 1 |



| Intersection |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 0.6 |  |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |  |
| Lane Configurations |  | $\uparrow$ | $\hat{}$ |  | M |  |  |
| Traffic Vol, veh/h | 1 | 130 | 65 | 5 | 10 | 1 |  |
| Future Vol, veh/h | 1 | 130 | 65 | 5 | 10 | 1 |  |
| Conflicting Peds, \#/hr | 2 | 0 | 0 | 2 | 0 |  |  |
| Sign Control F | Free | Free | Free | Free | Stop | Stop |  |
| RT Channelized | - | None | - | None | - | None |  |
| Storage Length | - | - | - | - | 0 | - |  |
| Veh in Median Storage, \# | \# - | 0 | 0 | - | 0 | - |  |
| Grade, \% | - | 0 | 0 | - | 0 | - |  |
| Peak Hour Factor | 74 | 74 | 74 | 74 | 74 | 74 |  |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |  |
| Mvmt Flow | 1 | 176 | 88 | 7 | 14 | 1 |  |



c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | :--- |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 195 | 0 | - | 0 | 311 | 184 |
| Stage 1 | - | - | - | - | 184 | - |
| Stage 2 | - | - | - | - | 127 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1390 | - | - | - | 686 | 864 |
| Stage 1 | - | - | - | - | 852 | - |
| Stage 2 | - | - | - | - | 904 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1390 | - | - | - | 683 | 864 |
| Mov Cap-2 Maneuver | - | - | - | - | 683 | - |
| Stage 1 | - | - | - | - | 848 | - |
| Stage 2 | - | - | - | - | 904 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 0.4 |  | 0 |  | 10 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT WBT |  | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1390 | - | - | - | 726 |
| HCM Lane V/C Ratio |  | 0.004 | - | - | - | 0.011 |
| HCM Control Delay (s) |  | 7.6 | 0 | - | - | 10 |
| HCM Lane LOS |  | A | A | - | - | B |
| HCM 95th \%tile Q(veh) |  | 0 | - | - | - | 0 |




| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 2.7 |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  | 个 | 个 | $\mathbf{F}$ | M |  |
| Traffic Vol, veh/h | 0 | 230 | 345 | 110 | 155 | 15 |
| Future Vol, veh/h | 0 | 230 | 345 | 110 | 155 | 15 |
| Conflicting Peds, \#/hr | 6 | 0 | 0 | 6 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | Stop |
| Storage Length | - | - | - | 0 | 0 | - |
| Veh in Median Storage, \# | - | 0 | 0 | - | 0 | - |
| Grade, \% | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 245 | 367 | 117 | 165 | 16 |


| Major/Minor M | Major1 |  |  |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | - | 0 | - | 0 | 618 | 374 |
| Stage 1 | - | - | - | - | 373 | - |
| Stage 2 | - | - | - | - | 245 | - |
| Critical Hdwy | - | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 0 | - | - | - | 456 | 677 |
| Stage 1 | 0 | - | - | - | 701 | - |
| Stage 2 | 0 | - | - | - | 800 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | - | - | - | - | 451 | 672 |
| Mov Cap-2 Maneuver | - | - | - | - | 543 | - |
| Stage 1 | - | - | - | - | 697 | - |
| Stage 2 | - | - | - | - | 795 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | B |  | SB |  |
| HCM Control Delay, s | 0 |  | 0 |  | 13.7 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt EBT WBT WBR SBLn1 |  |  |  |  |  |  |
| Capacity (veh/h) |  | - | - | - | 596 |  |
| HCM Lane V/C Ratio |  | - | - | - | 0.303 |  |
| HCM Control Delay (s) |  | - | - | - | 13.7 |  |
| HCM Lane LOS |  | - | - | - | B |  |
| HCM 95th \%tile Q(veh) |  | - | - | - | 1.3 |  |


c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{1}$ | 虫 |  | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | ${ }^{7}$ | $\uparrow$ |  | ${ }^{1}$ | $\hat{F}$ |  |
| Traffic Volume (vph) | 1 | 725 | 50 | 105 | 715 | 1 | 80 | 1 | 95 | 1 | 1 | 1 |
| Future Volume (vph) | 1 | 725 | 50 | 105 | 715 | 1 | 80 | 1 | 95 | 1 | 1 | 1 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.98 |  | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 0.99 | 1.00 |  | 0.99 | 1.00 |  |
| Frt | 1.00 | 0.99 |  | 1.00 | 1.00 |  | 1.00 | 0.85 |  | 1.00 | 0.93 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 3262 |  | 1646 | 3228 |  | 1602 | 1462 |  | 1653 | 1603 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.76 | 1.00 |  | 0.69 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 3262 |  | 1646 | 3228 |  | 1276 | 1462 |  | 1201 | 1603 |  |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 1 | 780 | 54 | 113 | 769 | 1 | 86 | 1 | 102 | 1 | 1 | 1 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 1 | 829 | 0 | 113 | 770 | 0 | 86 | 17 | 0 | 1 | 1 | 0 |
| Confl. Peds. (\#/hr) |  |  |  |  |  | 7 | 9 |  | 8 | 8 |  | 9 |
| Heavy Vehicles (\%) | 0\% | 1\% | 0\% | 1\% | 3\% | 0\% | 3\% | 0\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | Prot | NA |  | Prot | NA |  | Perm | NA |  | Perm | NA |  |
| Protected Phases | 5 | 2 |  | 1 | 6 |  |  | 8 |  |  | 4 |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | 4 |  |  |
| Actuated Green, G (s) | 0.4 | 29.3 |  | 7.3 | 36.2 |  | 8.3 | 8.3 |  | 8.3 | 8.3 |  |
| Effective Green, g (s) | 1.4 | 30.3 |  | 8.3 | 37.2 |  | 9.3 | 9.3 |  | 9.3 | 9.3 |  |
| Actuated g/C Ratio | 0.02 | 0.51 |  | 0.14 | 0.62 |  | 0.16 | 0.16 |  | 0.16 | 0.16 |  |
| Clearance Time (s) | 5.0 | 5.0 |  | 5.0 | 5.0 |  | 5.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 2.5 | 6.1 |  | 2.5 | 6.1 |  | 2.5 | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap (vph) | 38 | 1650 |  | 228 | 2004 |  | 198 | 226 |  | 186 | 248 |  |
| v/s Ratio Prot | 0.00 | c0.25 |  | c0.07 | 0.24 |  |  | 0.01 |  |  | 0.00 |  |
| v/s Ratio Perm |  |  |  |  |  |  | c0.07 |  |  | 0.00 |  |  |
| v/c Ratio | 0.03 | 0.50 |  | 0.50 | 0.38 |  | 0.43 | 0.07 |  | 0.01 | 0.00 |  |
| Uniform Delay, d1 | 28.6 | 9.8 |  | 23.9 | 5.6 |  | 22.9 | 21.6 |  | 21.4 | 21.4 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.2 | 0.7 |  | 1.2 | 0.4 |  | 1.1 | 0.1 |  | 0.0 | 0.0 |  |
| Delay (s) | 28.8 | 10.5 |  | 25.1 | 6.0 |  | 24.0 | 21.7 |  | 21.4 | 21.4 |  |
| Level of Service | C | B |  | C | A |  | C | C |  | C | C |  |
| Approach Delay (s) |  | 10.5 |  |  | 8.4 |  |  | 22.8 |  |  | 21.4 |  |
| Approach LOS |  | B |  |  | A |  |  | C |  |  | C |  |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 10.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.49 |  | 12.0 |
| Actuated Cycle Length (s) | 59.9 | Sum of lost time (s) | A |
| Intersection Capacity Utilization | $52.7 \%$ | ICU Level of Service |  |
| Analysis Period (min) | 15 |  |  |

c Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 4.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | ¢4 |  |  | 中 ${ }^{\text {a }}$ |  |  | $\ddagger$ |  |  | \& |  |
| Traffic Vol, veh/h | 255 | 515 | 0 | 0 | 730 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Future Vol, veh/h | 255 | 515 | 0 | 0 | 730 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Conflicting Peds, \#/hr | 10 | 0 | 11 | 11 | 0 | 10 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 280 | 566 | 0 | 0 | 802 | 16 | 5 | 1 | 16 | 5 | 0 | 121 |



c Critical Lane Group

c Critical Lane Group



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 2.1 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Mr |  |  | -1 | F |  |
| Traffic Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Future Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Conflicting Peds, \#/hr | 0 | 0 | 4 | 0 | 0 | 4 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 38 | 32 | 38 | 192 | 167 | 51 |


| Major/Minor M | Minor2 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 465 | 197 | 222 | 0 | - | 0 |
| Stage 1 | 197 | - | - | - | - | - |
| Stage 2 | 268 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | 4.1 | - | - | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | 2.2 | - | - | - |
| Pot Cap-1 Maneuver | 559 | 849 | 1359 | - | - | - |
| Stage 1 | 841 | - | - | - | - | - |
| Stage 2 | 782 | - | - | - | - | - |
| Platoon blocked, \% |  |  |  | - | - | - |
| Mov Cap-1 Maneuver | 537 | 846 | 1354 | - | - | - |
| Mov Cap-2 Maneuver | 537 | - | - | - | - | - |
| Stage 1 | 812 | - | - | - | - | - |
| Stage 2 | 779 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | NB |  | SB |  |
| HCM Control Delay, s | 11.3 |  | 1.3 |  | 0 |  |
| HCM LOS | B |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBL | NBT EBLn1 |  | SBT | SBR |
| Capacity (veh/h) |  | 1354 | - | 644 | - | - |
| HCM Lane V/C Ratio |  | 0.028 | - | 0.109 | - | - |
| HCM Control Delay (s) |  | 7.7 | 0 | 11.3 | - | - |
| HCM Lane LOS |  | A | A | B | - | - |
| HCM 95th \%tile Q(veh) |  | 0.1 | - | 0.4 | - | - |


| Intersection |  |
| :--- | ---: |
| Intersection Delay, s/veh $\quad 7.7$ |  |
| Intersection LOS | A |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | $\uparrow$ |  |  | ¢ |  |  | ¢ |  |  | ¢ |  |
| Traffic Vol, veh/h | 5 | 20 | 20 | 5 | 50 | 10 | 30 | 60 | 5 | 5 | 60 | 5 |
| Future Vol, veh/h | 5 | 20 | 20 | 5 | 50 | 10 | 30 | 60 | 5 | 5 | 60 | 5 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 6 | 23 | 23 | 6 | 58 | 12 | 35 | 70 | 6 | 6 | 70 | 6 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Right | NB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.4 |  |  | 7.7 |  |  | 7.9 |  |  | 7.7 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 | EBLL1 | WBLn1 | SBLn1 |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $32 \%$ | $11 \%$ | $8 \%$ | $7 \%$ |
| Vol Thu, \% | $63 \%$ | $44 \%$ | $77 \%$ | $86 \%$ |
| Vol Right, \% | $5 \%$ | $44 \%$ | $15 \%$ | $7 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 95 | 45 | 65 | 70 |
| LT Vol | 30 | 5 | 5 | 5 |
| Through Vol | 60 | 20 | 50 | 60 |
| RT Vol | 5 | 20 | 10 | 5 |
| Lane Flow Rate | 110 | 52 | 76 | 81 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.129 | 0.061 | 0.09 | 0.097 |
| Departure Headway (Hd) | 4.217 | 4.166 | 4.307 | 4.28 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 836 | 863 | 835 | 842 |
| Service Time | 2.311 | 2.174 | 2.315 | 2.28 |
| HCM Lane V/C Ratio | 0.132 | 0.06 | 0.091 | 0.096 |
| HCM Control Delay | 7.9 | 7.4 | 7.7 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.2 | 0.3 | 0.3 |



C Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 0.8 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\uparrow$ |  |  | * |  | ${ }^{*}$ | 中4 |  | ${ }^{7}$ | 中4 |  |
| Traffic Vol, veh/h | 5 | 1 | 20 | 5 | 1 | 5 | 40 | 720 | 5 | 2 | 755 | 5 |
| Future Vol, veh/h | 5 | 1 | 20 | 5 | 1 | 5 | 40 | 720 | 5 | 2 | 755 | 5 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 8 | 0 | 2 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 100 | - | - | 100 | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Mvmt Flow | 6 | 1 | 23 | 6 | 1 | 6 | 45 | 818 | 6 | 2 | 858 | 6 |



c Critical Lane Group



Analysis Period (min)
15
C Critical Lane Group



c Critical Lane Group

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |

c Critical Lane Group










| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.8 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | 1 |  |  | $\neq$ |
| Traffic Vol, veh/h | 35 | 2 | 425 | 40 | 5 | 375 |
| Future Vol, veh/h | 35 | 2 | 425 | 40 | 5 | 375 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 2 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 1 |
| Mvmt Flow | 37 | 2 | 452 | 43 | 5 | 399 |



| Intersection |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh 4.1 |  |  |  |  |  |  |
| Movement W | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ${ }^{7}$ | 「 | $\hat{\beta}$ |  | * | 4 |
| Traffic Vol, veh/h | 40 | 190 | 300 | 25 | 121 | 349 |
| Future Vol, veh/h | 40 | 190 | 300 | 25 | 121 | 349 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 1 | 1 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | 60 | - |
| Veh in Median Storage, \# | \# 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 43 | 202 | 319 | 27 | 129 | 371 |






|  | $\bigcirc$ | 4 |  |  |  | 1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |  |
| Lane Configurations | ${ }^{7}$ | 「 | $\uparrow$ |  | ${ }^{7}$ | 4 |  |
| Traffic Volume (vph) | 15 | 50 | 540 | 15 | 35 | 625 |  |
| Future Volume (vph) | 15 | 50 | 540 | 15 | 35 | 625 |  |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |  |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.85 | 1.00 |  | 1.00 | 1.00 |  |
| Flt Protected | 0.95 | 1.00 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1488 | 1727 |  | 1662 | 1733 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 |  | 0.38 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1488 | 1727 |  | 669 | 1733 |  |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |  |
| Adj. Flow (vph) | 18 | 59 | 635 | 18 | 41 | 735 |  |
| RTOR Reduction (vph) | 0 | 54 | 1 | 0 | 0 | 0 |  |
| Lane Group Flow (vph) | 18 | 5 | 652 | 0 | 41 | 735 |  |
| Heavy Vehicles (\%) | 0\% | 0\% | 1\% | 0\% | 0\% | 1\% |  |
| Turn Type | Prot | Perm | NA |  | Perm | NA |  |
| Protected Phases | 4 |  | 2 |  |  | 2 |  |
| Permitted Phases |  | 4 |  |  | 2 |  |  |
| Actuated Green, G (s) | 3.2 | 3.2 | 27.9 |  | 27.9 | 27.9 |  |
| Effective Green, g (s) | 3.2 | 3.2 | 28.9 |  | 28.9 | 28.9 |  |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.72 |  | 0.72 | 0.72 |  |
| Clearance Time (s) | 4.0 | 4.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 3.0 | 3.0 | 5.2 |  | 5.2 | 5.2 |  |
| Lane Grp Cap (vph) | 132 | 118 | 1244 |  | 482 | 1248 |  |
| v/s Ratio Prot | c0.01 |  | 0.38 |  |  | c0.42 |  |
| v/s Ratio Perm |  | 0.00 |  |  | 0.06 |  |  |
| v/c Ratio | 0.14 | 0.04 | 0.52 |  | 0.09 | 0.59 |  |
| Uniform Delay, d1 | 17.2 | 17.0 | 2.5 |  | 1.7 | 2.7 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.5 | 0.1 | 0.8 |  | 0.2 | 1.2 |  |
| Delay (s) | 17.6 | 17.2 | 3.3 |  | 1.8 | 3.9 |  |
| Level of Service | B | B | A |  | A | A |  |
| Approach Delay (s) | 17.3 |  | 3.3 |  |  | 3.8 |  |
| Approach LOS | B |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 4.3 |  | HCM 2000 | evel of Service | A |
| HCM 2000 Volume to Capacity ratio |  |  | 0.54 |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 40.1 |  | Sum of los | me (s) | 8.0 |
| Intersection Capacity Utilization |  |  | 46.5\% |  | CU Level | Service | A |
| Analysis Period (min) |  |  | 15 |  |  |  |  |
| C Critical Lane Group |  |  |  |  |  |  |  |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 5.3 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | $\uparrow$ |  |  | $\uparrow$ |
| Traffic Vol, veh/h | 40 | 125 | 185 | 30 | 175 | 200 |
| Future Vol, veh/h | 40 | 125 | 185 | 30 | 175 | 200 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 85 | 85 | 85 | 85 | 85 | 85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 47 | 147 | 218 | 35 | 206 | 235 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 883 | 236 | 0 | 0 | 253 | 0 |
| Stage 1 | 236 | - | - | - | - | - |
| Stage 2 | 647 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 319 | 808 | - | - | 1324 | - |
| Stage 1 | 808 | - | - | - | - | - |
| Stage 2 | 525 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 262 | 808 | - | - | 1324 | - |
| Mov Cap-2 Maneuver | 262 | - | - | - | - | - |
| Stage 1 | 663 | - | - | - | - | - |
| Stage 2 | 525 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 15.5 |  | 0 |  | 3.8 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRWBLn1 |  | SBL | SBT |
| Capacity (veh/h) |  | - | - | 537 | 1324 | - |
| HCM Lane V/C Ratio |  | - | - | 0.361 | 0.156 | - |
| HCM Control Delay (s) |  | - | - | 15.5 | 8.2 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 1.6 | 0.6 | - |


c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Minor2 | Major2 |  |  |
| :--- | ---: | ---: | ---: | :--- |
| Conflicting Flow All | - | 222 | 0 | 0 |
| $\quad$ Stage 1 | - | - | - | - |
| $\quad$ Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.22 | 4.1 | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.318 | 2.2 | - |
| Pot Cap-1 Maneuver | 0 | 818 | - | - |
| $\quad$ Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, \% |  |  |  | - |
| Mov Cap-1 Maneuver | 0 | 818 | - | - |
| Mov Cap-2 Maneuver | 0 | - | - | - |
| $\quad$ Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
|  |  |  |  |  |


|  | EB | WB |  |
| :--- | ---: | ---: | ---: |
| Approach |  |  |  |
| HCM Control Delay, s | 9.7 |  |  |
| HCM LOS | A |  |  |
|  |  |  |  |
|  |  |  |  |
| Minor Lane/Major Mvmt | EBLn1 | WBL | WBT |
| Capacity (veh/h) | 818 | - | - |
| HCM Lane V/C Ratio | 0.063 | - | - |
| HCM Control Delay (s) | 9.7 | - | - |
| HCM Lane LOS | A | - | - |
| HCM 95th \%tile Q(veh) | 0.2 | - | - |


c Critical Lane Group

c Critical Lane Group

| Intersection |  |
| :--- | :--- |
| Intersection Delay, s/veh | 8 |
| Intersection LOS | A |



| Lane | EBLn1WBLn1 SBLn1 |  |  |
| :--- | ---: | ---: | ---: |
| Vol Left, \% | $87 \%$ | $0 \%$ | $32 \%$ |
| Vol Thru, \% | $13 \%$ | $14 \%$ | $0 \%$ |
| Vol Right, \% | $0 \%$ | $86 \%$ | $68 \%$ |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 75 | 140 | 155 |
| LT Vol | 65 | 0 | 50 |
| Through Vol | 10 | 20 | 0 |
| RT Vol | 0 | 120 | 105 |
| Lane Flow Rate | 88 | 165 | 182 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.114 | 0.178 | 0.208 |
| Departure Headway (Hd) | 4.632 | 3.884 | 4.098 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 776 | 926 | 877 |
| Service Time | 2.649 | 1.898 | 2.113 |
| HCM Lane V/C Ratio | 0.113 | 0.178 | 0.208 |
| HCM Control Delay | 8.2 | 7.7 | 8.2 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.6 | 0.8 |

Intersection
Intersection Delay, s/veh 7.5
Intersection LOS A

| Movement EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | \& |  |  | \& |  |  | * |  |  | \$ |  |
| Traffic Vol, veh/h 1 | 1 | 1 | 5 | 5 | 55 | 1 | 2 | 5 | 90 | 5 | 1 |
| Future Vol, veh/h 1 | 1 | 1 | 5 | 5 | 55 | 1 | 2 | 5 | 90 | 5 | 1 |
| Peak Hour Factor 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow 1 | 1 | 1 | 6 | 6 | 65 | 1 | 2 | 6 | 106 | 6 | 1 |
| Number of Lanes 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach RighNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay 7.1 |  |  | 7 |  |  | 6.9 |  |  | 7.9 |  |  |
| HCMLOS A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $12 \%$ | $33 \%$ | $8 \%$ | $94 \%$ |
| Vol Thru, \% | $25 \%$ | $33 \%$ | $8 \%$ | $5 \%$ |
| Vol Right, \% | $62 \%$ | $33 \%$ | $85 \%$ | $1 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 8 | 3 | 65 | 96 |
| LT Vol | 1 | 1 | 5 | 90 |
| Through Vol | 2 | 1 | 5 | 5 |
| RT Vol | 5 | 1 | 55 | 1 |
| Lane Flow Rate | 9 | 4 | 76 | 113 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.01 | 0.004 | 0.077 | 0.133 |
| Departure Headway (Hd) | 3.775 | 4.037 | 3.621 | 4.227 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 942 | 875 | 977 | 849 |
| Service Time | 1.823 | 2.115 | 1.689 | 2.249 |
| HCM Lane V/C Ratio | 0.01 | 0.005 | 0.078 | 0.133 |
| HCM Control Delay | 6.9 | 7.1 | 7 | 7.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0 | 0.2 | 0.5 |


| Intersection |
| :--- |
| Intersection Delay, s/veh 7.5 |
| Intersection LOS A |


| Movement EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 4 |  |  | * |  |  | 4 |  |  | 4 |  |
| Traffic Vol, veh/h 5 | 10 | 5 | 1 | 10 | 5 | 15 | 45 | 5 | 5 | 80 | 10 |
| Future Vol, veh/h 5 | 10 | 5 | 1 | 10 | 5 | 15 | 45 | 5 | 5 | 80 | 10 |
| Peak Hour Factor 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| Mvmt Flow 6 | 12 | 6 | 1 | 12 | 6 | 18 | 53 | 6 | 6 | 94 | 12 |
| Number of Lanes 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach RighNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay 7.3 |  |  | 7.2 |  |  | 7.5 |  |  | 7.6 |  |  |
| HCM LOS A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $23 \%$ | $25 \%$ | $6 \%$ | $5 \%$ |
| Vol Thru, \% | $69 \%$ | $50 \%$ | $62 \%$ | $84 \%$ |
| Vol Right, \% | $8 \%$ | $25 \%$ | $31 \%$ | $11 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 65 | 20 | 16 | 95 |
| LT Vol | 15 | 5 | 1 | 5 |
| Through Vol | 45 | 10 | 10 | 80 |
| RT Vol | 5 | 5 | 5 | 10 |
| Lane Flow Rate | 76 | 24 | 19 | 112 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.086 | 0.027 | 0.021 | 0.124 |
| Departure Headway (Hd) | 4.058 | 4.138 | 4.066 | 3.979 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 879 | 853 | 867 | 899 |
| Service Time | 2.1 | 2.223 | 2.154 | 2.014 |
| HCM Lane V/C Ratio | 0.086 | 0.028 | 0.022 | 0.125 |
| HCM Control Delay | 7.5 | 7.3 | 7.2 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 0.1 | 0.1 | 0.4 |


c Critical Lane Group



c Critical Lane Group

|  | 4 |  |  | $\checkmark$ |  |  | 4 | $\uparrow$ | P |  | $\downarrow$ | $\checkmark$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\uparrow \uparrow$ |  |  | $\uparrow$ | F |  | $\uparrow \uparrow$ | F |  |  |  |
| Traffic Volume (vph) | 95 | 335 | 0 | 0 | 255 | 185 | 30 | 960 | 140 | 0 | 0 | 0 |
| Future Volume (vph) | 95 | 335 | 0 | 0 | 255 | 185 | 30 | 960 | 140 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) |  | 4.0 |  |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |  |  |
| Lane Util. Factor |  | 0.95 |  |  | 1.00 | 1.00 |  | 0.95 | 1.00 |  |  |  |
| Frpb, ped/bikes |  | 1.00 |  |  | 1.00 | 0.98 |  | 1.00 | 0.99 |  |  |  |
| Flpb, ped/bikes |  | 1.00 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Frt |  | 1.00 |  |  | 1.00 | 0.85 |  | 1.00 | 0.85 |  |  |  |
| Flt Protected |  | 0.99 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Satd. Flow (prot) |  | 3272 |  |  | 1750 | 1446 |  | 3220 | 1468 |  |  |  |
| Flt Permitted |  | 0.71 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Satd. Flow (perm) |  | 2361 |  |  | 1750 | 1446 |  | 3220 | 1468 |  |  |  |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 97 | 342 | 0 | 0 | 260 | 189 | 31 | 980 | 143 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 120 | 0 | 0 | 53 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 439 | 0 | 0 | 260 | 69 | 0 | 1011 | 90 | 0 | 0 | 0 |
| Confl. Peds. (\#/hr) | 6 |  | 10 | 10 |  | 6 | 5 |  | 1 | 1 |  | 5 |
| Heavy Vehicles (\%) | 2\% | 0\% | 0\% | 0\% | 0\% | 1\% | 6\% | 3\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | pm+pt | NA |  |  | NA | Perm | Perm | NA | Perm |  |  |  |
| Protected Phases | 3 | 8 |  |  | 4 |  |  | 6 |  |  |  |  |
| Permitted Phases | 8 |  |  |  |  | 4 | 6 |  | 6 |  |  |  |
| Actuated Green, G (s) |  | 17.2 |  |  | 17.2 | 17.2 |  | 42.8 | 42.8 |  |  |  |
| Effective Green, g (s) |  | 17.7 |  |  | 17.7 | 17.7 |  | 44.3 | 44.3 |  |  |  |
| Actuated g/C Ratio |  | 0.25 |  |  | 0.25 | 0.25 |  | 0.63 | 0.63 |  |  |  |
| Clearance Time (s) |  | 4.5 |  |  | 4.5 | 4.5 |  | 5.5 | 5.5 |  |  |  |
| Vehicle Extension (s) |  | 2.5 |  |  | 2.5 | 2.5 |  | 5.0 | 5.0 |  |  |  |
| Lane Grp Cap (vph) |  | 596 |  |  | 442 | 365 |  | 2037 | 929 |  |  |  |
| v/s Ratio Prot |  |  |  |  | 0.15 |  |  |  |  |  |  |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Perm |  | c0. 19 |  |  |  | 0.05 |  | 0.31 | 0.06 |  |  |  |
| v/c Ratio |  | 0.74 |  |  | 0.59 | 0.19 |  | 0.50 | 0.10 |  |  |  |
| Uniform Delay, d1 |  | 24.0 |  |  | 23.0 | 20.5 |  | 6.9 | 5.0 |  |  |  |
| Progression Factor |  | 1.29 |  |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  |  |
| Incremental Delay, d2 |  | 4.4 |  |  | 1.7 | 0.2 |  | 0.9 | 0.2 |  |  |  |
| Delay (s) |  | 35.4 |  |  | 24.6 | 20.7 |  | 7.7 | 5.2 |  |  |  |
| Level of Service |  | D |  |  | C | C |  | A | A |  |  |  |
| Approach Delay (s) |  | 35.4 |  |  | 23.0 |  |  | 7.4 |  |  | 0.0 |  |
| Approach LOS |  | D |  |  | C |  |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 16.9 |  | HCM 2000 | Level of S | ervice |  | B |  |  |  |
| HCM 2000 Volume to Capacity ratio |  |  | 0.61 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 70.0 |  | Sum of los | time (s) |  |  | 12.5 |  |  |  |
| Intersection Capacity Utilization |  |  | 72.7\% |  | CU Level | f Service |  |  | C |  |  |  |
| Analysis Period (min) |  |  | 15 |  |  |  |  |  |  |  |  |  |
| c Critical Lane Group |  |  |  |  |  |  |  |  |  |  |  |  |





| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 125 | 0 | - | 0 | 432 | 122 |
| Stage 1 | - | - | - | - | 122 | - |
| Stage 2 | - | - | - | - | 310 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.21 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.309 |
| Pot Cap-1 Maneuver | 1474 | - | - | - | 584 | 932 |
| Stage 1 | - | - | - | - | 908 | - |
| Stage 2 | - | - | - | - | 748 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1474 | - | - | - | 568 | 932 |
| Mov Cap-2 Maneuver | - | - | - | - | 568 | - |
| Stage 1 | - | - | - | - | 883 | - |
| Stage 2 | - | - | - | - | 748 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 1.2 |  | 0 |  | 9.5 |  |
| HCM LOS |  |  |  |  | A |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT WBT |  | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1474 | - | - | - | 894 |
| HCM Lane V/C Ratio |  | 0.028 | - | - | - | 0.1 |
| HCM Control Delay (s) |  | 7.5 | - | - | - | 9.5 |
| HCM Lane LOS |  | A | - | - | - | A |
| HCM 95th \%tile Q(veh) |  | 0.1 | - | - | - | 0.3 |




| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 6.6 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | * |  |  | * |  |  | $\uparrow$ |  |  | $\uparrow$ |  |
| Traffic Vol, veh/h | 0 | 0 | 0 | 10 | 0 | 5 | 0 | 1 | 10 | 5 | 1 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 10 | 0 | 5 | 0 | 1 | 10 | 5 | 1 | 0 |
| Conflicting Peds, \#/hr | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 0 | 14 | 0 | 7 | 0 | 1 | 14 | 7 | 1 | 0 |







| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 9.8 |  |  |  |  |  |  |  |  |  |  |  |
| Movement E | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\uparrow$ |  |  | $\uparrow$ |  | ${ }^{*}$ |  |  |  | $\uparrow$ |  |
| Traffic Vol, veh/h | 0 | 20 | 45 | 185 | 15 | 0 | 70 | 0 | 260 | 0 | 0 | 0 |
| Future Vol, veh/h | 0 | 20 | 45 | 185 | 15 | 0 | 70 | 0 | 260 | 0 | 0 | 0 |
| Conflicting Peds, \#/hr | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control Stop | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | Free | - | - | None |
| Storage Length | - | - | - | - | - | - | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 16974 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 93 | 93 | 93 | 93 | 92 | 93 | 92 | 93 | 92 | 92 | 92 |
| Heavy Vehicles, \% | 2 | 0 | 0 | 0 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 48 | 199 | 16 | 0 | 75 | 0 | 280 | 0 | 0 | 0 |







c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| $l$ |  |  |  |  |  |  |





| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | - | 0 | - | 0 | - 618 | 374 |
| Stage 1 | - | - | - |  | - 373 | - |
| Stage 2 | - | - | - |  | 245 | - |
| Critical Hdwy | - | - | - |  | - 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - |  | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - |  | 5.4 | - |
| Follow-up Hdwy | - | - | - |  | - 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 0 | - | - |  | - 456 | 677 |
| Stage 1 | 0 | - | - |  | - 701 | - |
| Stage 2 | 0 | - | - |  | - 800 | - |
| Platoon blocked, \% |  | - | - |  | - |  |
| Mov Cap-1 Maneuver | - | - | - |  | - 451 | 672 |
| Mov Cap-2 Maneuver | - | - | - |  | - 543 | - |
| Stage 1 | - | - | - |  | - 697 | - |
| Stage 2 | - | - | - |  | - 795 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 0 |  | 0 |  | 13.7 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBT WBT WBR SBLn1 |  |  |  |  |
| Capacity (veh/h) |  | - | - |  | - 596 |  |
| HCM Lane V/C Ratio |  | - | - |  | 0.303 |  |
| HCM Control Delay (s) |  | - | - | - | - 13.7 |  |
| HCM Lane LOS |  | - | - | - | - B |  |
| HCM 95th \%tile Q(veh) |  | - | - | - | - 1.3 |  |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{7}$ | 性 |  | \％ | 个t |  |  | $\uparrow$ | 「 | ${ }^{7}$ | $\uparrow$ |  |
| Traffic Volume（vph） | 20 | 300 | 115 | 395 | 300 | 10 | 155 | 40 | 395 | 45 | 45 | 15 |
| Future Volume（vph） | 20 | 300 | 115 | 395 | 300 | 10 | 155 | 40 | 395 | 45 | 45 | 15 |
| Ideal Flow（vphpl） | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time（s） | 4.0 | 4.0 |  | 4.0 | 4.0 |  |  | 4.0 | 5.0 | 4.0 | 4.0 |  |
| Lane Util．Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frpb，ped／bikes | 1.00 | 0.99 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Flpb，ped／bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.96 |  | 1.00 | 1.00 |  |  | 1.00 | 0.85 | 1.00 | 0.96 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.96 | 1.00 | 0.95 | 1.00 |  |
| Satd．Flow（prot） | 1662 | 3162 |  | 1646 | 3305 |  |  | 1677 | 1473 | 1662 | 1677 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.73 | 1.00 | 0.52 | 1.00 |  |
| Satd．Flow（perm） | 1662 | 3162 |  | 1646 | 3305 |  |  | 1268 | 1473 | 904 | 1677 |  |
| Peak－hour factor，PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj．Flow（vph） | 22 | 323 | 124 | 425 | 323 | 11 | 167 | 43 | 425 | 48 | 48 | 16 |
| RTOR Reduction（vph） | 0 | 37 | 0 | 0 | 2 | 0 | 0 | 0 | 90 | 0 | 11 | 0 |
| Lane Group Flow（vph） | 22 | 410 | 0 | 425 | 332 | 0 | 0 | 210 | 335 | 48 | 53 | 0 |
| Confl．Peds．（\＃／hr） | 7 |  | 8 | 8 |  | 7 | 5 |  |  |  |  | 5 |
| Heavy Vehicles（\％） | 0\％ | 0\％ | 1\％ | 1\％ | 0\％ | 0\％ | 0\％ | 0\％ | 1\％ | 0\％ | 0\％ | 0\％ |
| Turn Type | Split | NA |  | Split | NA |  | Perm | NA | pt＋ov | Perm | NA |  |
| Protected Phases | 2 | 2 |  | 6 | 6 |  |  | 8 | 86 |  | ， |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | ， |  |  |
| Actuated Green，G（s） | 14.9 | 14.9 |  | 24.0 | 24.0 |  |  | 16.0 | 45.5 | 16.0 | 16.0 |  |
| Effective Green， g （s） | 15.4 | 15.4 |  | 25.5 | 25.5 |  |  | 17.0 | 40.0 | 17.0 | 17.0 |  |
| Actuated g／C Ratio | 0.22 | 0.22 |  | 0.36 | 0.36 |  |  | 0.24 | 0.57 | 0.24 | 0.24 |  |
| Clearance Time（s） | 4.5 | 4.5 |  | 5.5 | 5.5 |  |  | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension（s） | 2.5 | 2.5 |  | 2.5 | 2.5 |  |  | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap（vph） | 366 | 696 |  | 600 | 1205 |  |  | 308 | 842 | 219 | 407 |  |
| v／s Ratio Prot | 0.01 | c0．13 |  | c0．26 | 0.10 |  |  |  | 0.23 |  | 0.03 |  |
| v／s Ratio Perm |  |  |  |  |  |  |  | c0．17 |  | 0.05 |  |  |
| v／c Ratio | 0.06 | 0.59 |  | 0.71 | 0.28 |  |  | 0.68 | 0.40 | 0.22 | 0.13 |  |
| Uniform Delay，d1 | 21.5 | 24.4 |  | 19.0 | 15.7 |  |  | 24.0 | 8.3 | 21.1 | 20.7 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Incremental Delay，d2 | 0.1 | 1.1 |  | 3.5 | 0.1 |  |  | 5.6 | 0.2 | 0.4 | 0.1 |  |
| Delay（s） | 21.6 | 25.5 |  | 22.6 | 15.8 |  |  | 29.6 | 8.5 | 21.5 | 20.8 |  |
| Level of Service | C | C |  | C | B |  |  | C | A | C | C |  |
| Approach Delay（s） |  | 25.3 |  |  | 19.6 |  |  | 15.5 |  |  | 21.1 |  |
| Approach LOS |  | C |  |  | B |  |  | B |  |  | C |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 19.7 |  | HCM 2000 | Level of | ervice |  | B |  |  |  |
| HCM 2000 Control Delay to Capacity ratio |  |  | 0.70 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length（s） |  |  | 69.9 |  | Sum of los | time（s） |  |  | 14.5 |  |  |  |
| Intersection Capacity Utilization |  |  | 67．4\％ |  | CU Level | f Service |  |  | C |  |  |  |
| Analysis Period（min） |  |  | 15 |  |  |  |  |  |  |  |  |  |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | ${ }^{7}$ | 中 ${ }^{\text {F }}$ |  | ${ }^{*}$ | $\uparrow$ |  | ${ }^{*}$ | $\hat{\beta}$ |  |
| Traffic Volume (vph) | 1 | 725 | 50 | 105 | 715 | 1 | 80 | 1 | 95 | 1 | 1 | 1 |
| Future Volume (vph) | 1 | 725 | 50 | 105 | 715 | 1 | 80 | 1 | 95 | 1 | 1 | 1 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.98 |  | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 0.99 | 1.00 |  | 0.99 | 1.00 |  |
| Frt | 1.00 | 0.99 |  | 1.00 | 1.00 |  | 1.00 | 0.85 |  | 1.00 | 0.93 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 3262 |  | 1646 | 3228 |  | 1602 | 1462 |  | 1653 | 1603 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.76 | 1.00 |  | 0.69 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 3262 |  | 1646 | 3228 |  | 1276 | 1462 |  | 1201 | 1603 |  |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 1 | 780 | 54 | 113 | 769 | 1 | 86 | 1 | 102 | 1 | 1 | 1 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 1 | 829 | 0 | 113 | 770 | 0 | 86 | 17 | 0 | 1 | 1 | 0 |
| Confl. Peds. (\#/hr) |  |  |  |  |  | 7 | 9 |  | 8 | 8 |  | 9 |
| Heavy Vehicles (\%) | 0\% | 1\% | 0\% | 1\% | 3\% | 0\% | 3\% | 0\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | Prot | NA |  | Prot | NA |  | Perm | NA |  | Perm | NA |  |
| Protected Phases | 5 | 2 |  | 1 | 6 |  |  | 8 |  |  | 4 |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | 4 |  |  |
| Actuated Green, G (s) | 0.4 | 29.3 |  | 7.3 | 36.2 |  | 8.3 | 8.3 |  | 8.3 | 8.3 |  |
| Effective Green, g (s) | 1.4 | 30.3 |  | 8.3 | 37.2 |  | 9.3 | 9.3 |  | 9.3 | 9.3 |  |
| Actuated g/C Ratio | 0.02 | 0.51 |  | 0.14 | 0.62 |  | 0.16 | 0.16 |  | 0.16 | 0.16 |  |
| Clearance Time (s) | 5.0 | 5.0 |  | 5.0 | 5.0 |  | 5.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 2.5 | 6.1 |  | 2.5 | 6.1 |  | 2.5 | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap (vph) | 38 | 1650 |  | 228 | 2004 |  | 198 | 226 |  | 186 | 248 |  |
| v/s Ratio Prot | 0.00 | c0.25 |  | c0.07 | 0.24 |  |  | 0.01 |  |  | 0.00 |  |
| v/s Ratio Perm |  |  |  |  |  |  | c0.07 |  |  | 0.00 |  |  |
| v/c Ratio | 0.03 | 0.50 |  | 0.50 | 0.38 |  | 0.43 | 0.07 |  | 0.01 | 0.00 |  |
| Uniform Delay, d1 | 28.6 | 9.8 |  | 23.9 | 5.6 |  | 22.9 | 21.6 |  | 21.4 | 21.4 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.2 | 0.7 |  | 1.2 | 0.4 |  | 1.1 | 0.1 |  | 0.0 | 0.0 |  |
| Delay (s) | 28.8 | 10.5 |  | 25.1 | 6.0 |  | 24.0 | 21.7 |  | 21.4 | 21.4 |  |
| Level of Service | C | B |  | C | A |  | C | C |  | C | C |  |
| Approach Delay (s) |  | 10.5 |  |  | 8.4 |  |  | 22.8 |  |  | 21.4 |  |
| Approach LOS |  | B |  |  | A |  |  | C |  |  | C |  |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 10.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.49 |  | 12.0 |
| Actuated Cycle Length (s) | 59.9 | Sum of lost time (s) | A |
| Intersection Capacity Utilization | $52.7 \%$ | ICU Level of Service |  |
| Analysis Period (min) | 15 |  |  |

c Critical Lane Group


Analysis Period (min)
15
C Critical Lane Group




C Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |



| Intersection |  |
| :--- | ---: | :--- |
| Intersection Delay, s/veh | 7.7 |
| Intersection LOS | A |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | \& |  |  | \& |  |  | \& |  |  | ¢ |  |
| Traffic Vol, veh/h | 5 | 20 | 20 | 5 | 50 | 10 | 30 | 60 | 5 | 5 | 60 | 5 |
| Future Vol, veh/h | 5 | 20 | 20 | 5 | 50 | 10 | 30 | 60 | 5 | 5 | 60 | 5 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 6 | 23 | 23 | 6 | 58 | 12 | 35 | 70 | 6 | 6 | 70 | 6 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Right | NB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.4 |  |  | 7.7 |  |  | 7.9 |  |  | 7.7 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $32 \%$ | $11 \%$ | $8 \%$ | $7 \%$ |
| Vol Thru, \% | $63 \%$ | $44 \%$ | $77 \%$ | $86 \%$ |
| Vol Right, \% | $5 \%$ | $44 \%$ | $15 \%$ | $7 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 95 | 45 | 65 | 70 |
| LT Vol | 30 | 5 | 5 | 5 |
| Through Vol | 60 | 20 | 50 | 60 |
| RT Vol | 5 | 20 | 10 | 5 |
| Lane Flow Rate | 110 | 52 | 76 | 81 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.129 | 0.061 | 0.09 | 0.097 |
| Departure Headway (Hd) | 4.217 | 4.166 | 4.307 | 4.28 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 836 | 863 | 835 | 842 |
| Service Time | 2.311 | 2.174 | 2.315 | 2.28 |
| HCM Lane V/C Ratio | 0.132 | 0.06 | 0.091 | 0.096 |
| HCM Control Delay | 7.9 | 7.4 | 7.7 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.2 | 0.3 | 0.3 |


c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 0.8 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\ddagger$ |  |  | * |  | ${ }^{*}$ | 44 |  | ${ }^{*}$ | 44 |  |
| Traffic Vol, veh/h | 5 | 1 | 20 | 5 | 1 | 5 | 40 | 720 | 5 | 2 | 755 | 5 |
| Future Vol, veh/h | 5 | 1 | 20 | 5 | 1 | 5 | 40 | 720 | 5 | 2 | 755 | 5 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 8 | 0 | 2 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 100 | - | - | 100 | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Mvmt Flow | 6 | 1 | 23 | 6 | 1 | 6 | 45 | 818 | 6 | 2 | 858 | 6 |



c Critical Lane Group



Analysis Period (min)
15
C Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |



c Critical Lane Group

|  | 4 |  |  | 7 |  |  | 4 | $\dagger$ | $p$ |  | $\downarrow$ | $\downarrow$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | \% | $\uparrow$ | F | ${ }^{7}$ | $\uparrow$ |  | \% | $\uparrow$ |  | ${ }^{7}$ | $\uparrow$ |  |
| Trafic Volume (vph) | 60 | 423 | 125 | 10 | 360 | 25 | 160 | 120 | 32 | 16 | 90 | 80 |
| Future Volume (vph) | 60 | 423 | 125 | 10 | 360 | 25 | 160 | 120 | 32 | 16 | 90 | 80 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Fit | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 |  | 1.00 | 0.97 |  | 1.00 | 0.93 |  |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1750 | 1455 | 1662 | 1717 |  | 1662 | 1687 |  | 1662 | 1614 |  |
| FIt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1750 | 1455 | 1662 | 1717 |  | 1662 | 1687 |  | 1662 | 1614 |  |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 65 | 455 | 134 | 11 | 387 | 27 | 172 | 129 | 34 | 17 | 97 | 86 |
| RTOR Reduction (vph) | 0 | 0 | 78 | 0 | 2 | 0 | 0 | 8 | 0 | 0 | 32 | 0 |
| Lane Group Flow (vph) | 65 | 455 | 56 | 11 | 412 | 0 | 172 | 155 | 0 | 17 | 151 | 0 |
| Confl. Peds. (\#/hr) |  |  | 1 | 1 |  |  | 4 |  | 1 | 1 |  | 4 |
| Heavy Vehicles (\%) | 0\% | 0\% | 0\% | 0\% | 1\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | Prot | NA | Perm | Prot | NA |  | Prot | NA |  | Prot | NA |  |
| Protected Phases | 5 | 2 |  | 1 | 6 |  | , | 8 |  | 7 | , |  |
| Permitted Phases |  |  | 2 |  |  |  |  |  |  |  |  |  |
| Actuated Green, G (s) | 6.6 | 33.6 | 33.6 | 1.1 | 28.1 |  | 12.7 | 26.2 |  | 2.3 | 15.8 |  |
| Effective Green, g (s) | 7.1 | 34.1 | 34.1 | 1.6 | 28.6 |  | 13.2 | 26.7 |  | 2.8 | 16.3 |  |
| Actuated g/C Ratio | 0.09 | 0.42 | 0.42 | 0.02 | 0.35 |  | 0.16 | 0.33 |  | 0.03 | 0.20 |  |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |  | 4.5 | 4.5 |  | 4.5 | 4.5 |  |
| Vehicle Extension (s) | 2.5 | 6.0 | 6.0 | 2.5 | 6.0 |  | 2.5 | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap (vph) | 145 | 734 | 611 | 32 | 604 |  | 270 | 554 |  | 57 | 323 |  |
| v/s Ratio Prot | c0.04 | c0.26 |  | 0.01 | c0.24 |  | c0.10 | 0.09 |  | 0.01 | c0.09 |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Perm |  |  | 0.04 |  |  |  |  |  |  |  |  |  |
| $\mathrm{v} / \mathrm{c}$ Ratio | 0.45 | 0.62 | 0.09 | 0.34 | 0.68 |  | 0.64 | 0.28 |  | 0.30 | 0.47 |  |
| Uniform Delay, d1 | 35.2 | 18.5 | 14.2 | 39.3 | 22.4 |  | 31.8 | 20.1 |  | 38.2 | 28.6 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 1.6 | 2.7 | 0.2 | 4.6 | 4.8 |  | 4.3 | 0.2 |  | 2.1 | 0.8 |  |
| Delay (s) | 36.8 | 21.2 | 14.4 | 43.9 | 27.2 |  | 36.0 | 20.3 |  | 40.4 | 29.4 |  |
| Level of Service | D | C | B | D | C |  | D | C |  | D | C |  |
| Approach Delay (s) |  | 21.3 |  |  | 27.7 |  |  | 28.4 |  |  | 30.3 |  |
| Approach LOS |  | C |  |  | C |  |  | C |  |  | C |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 25.6 |  | HCM 2000 | Level of S | ervice |  | C |  |  |  |
| HCM 2000 Volume to Capacity ratio |  |  | 0.59 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 81.2 |  | um of los | ime (s) |  |  | 16.0 |  |  |  |
| Intersection Capacity Utilization |  |  | 61.9\% | ICU Level of Service |  |  |  | B |  |  |  |  |
| Analysis Period (min) |  |  | 15 |  |  |  |  |  |  |  |  |  |

C Critical Lane Group






| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh 2.9 |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ${ }^{*}$ | 㻢 |  | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  |  | $\uparrow$ |  |  | $\uparrow$ |  |
| Traffic Vol, veh/h | 5 | 605 | 30 | 160 | 730 | 5 | 10 | 1 | 150 | 5 | 1 | 2 |
| Future Vol, veh/h | 5 | 605 | 30 | 160 | 730 | 5 | 10 | 1 | 150 | 5 | 1 | 2 |
| Conflicting Peds, \#/hr | 9 | 0 | 3 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 200 | - | - | 200 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 5 | 637 | 32 | 168 | 768 | 5 | 11 | 1 | 158 | 5 | 1 | 2 |



c Critical Lane Group


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Minor1 | Major1 |  |  | Major2 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 885 | 476 | 0 | 0 | 497 | 0 |  |
| Stage 1 | 476 | - | - | - | - | - |  |
| Stage 2 | 409 | - | - | - | - | - |  |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |  |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |  |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |  |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |  |
| Pot Cap-1 Maneuver | 318 | 593 | - | - | 1077 | - |  |
| Stage 1 | 629 | - | - | - | - | - |  |
| Stage 2 | 675 | - | - | - | - | - |  |
| Platoon blocked, \% |  |  | - | - |  | - |  |
| Mov Cap-1 Maneuver | 315 | 592 | - | - | 1075 | - |  |
| Mov Cap-2 Maneuver | 315 | - | - | - | - | - |  |
| Stage 1 | 624 | - | - | - | - | - |  |
| Stage 2 | 675 | - | - | - | - | - |  |
|  |  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |  |
| HCM Control Delay, s | 17.7 |  | 0 |  | 0.1 |  |  |
| HCM LOS | C |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBR | VLn1 | SBL | SBT |  |
| Capacity (veh/h) |  | - | - | 323 | 1075 | - |  |
| HCM Lane V/C Ratio |  | - | - | 0.122 | 0.005 | - |  |
| HCM Control Delay (s) |  | - | - | 17.7 | 8.4 | 0 |  |
| HCM Lane LOS |  | - | - | C | A | A |  |
| HCM 95th \%tile Q(veh) |  | - | - | 0.4 | 0 | - |  |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 4.1 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | T | $\mathbf{7}$ | $\boldsymbol{F}$ |  | a | 4 |
| Traffic Vol, veh/h | 40 | 190 | 300 | 25 | 121 | 349 |
| Future Vol, veh/h | 40 | 190 | 300 | 25 | 121 | 349 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 1 | 1 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | 60 | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 43 | 202 | 319 | 27 | 129 | 371 |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 6.4 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | M |  |  | 4 | l |  |
| Traffic Vol, veh/h | 75 | 195 | 105 | 235 | 192 | 33 |
| Future Vol, veh/h | 75 | 195 | 105 | 235 | 192 | 33 |
| Conflicting Peds, \#/hr | 1 | 0 | 1 | 0 | 0 | 1 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | 60 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 82 | 214 | 115 | 258 | 211 | 36 |


| Major/Minor M | Minor2 |  | Major1 |  | ajor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 719 | 230 | 248 | 0 | - | 0 |
| Stage 1 | 230 | - | - | - | - | - |
| Stage 2 | 489 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | 4.11 | - | - | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | 2.209 | - | - | - |
| Pot Cap-1 Maneuver | 398 | 814 | 1324 | - | - | - |
| Stage 1 | 813 | - | - | - | - | - |
| Stage 2 | 621 | - | - | - | - | - |
| Platoon blocked, \% |  |  |  | - | - | - |
| Mov Cap-1 Maneuver | 363 | 813 | 1323 | - | - | - |
| Mov Cap-2 Maneuver | 363 | - | - | - | - | - |
| Stage 1 | 741 | - | - | - | - | - |
| Stage 2 | 620 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | NB |  | SB |  |
| HCM Control Delay, s | 16.5 |  | 2.5 |  | 0 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBL NBT EBLn1 |  |  | SBT | BR |
| Capacity (veh/h) |  | 1323 | - | 605 | - | - |
| HCM Lane V/C Ratio |  | 0.087 | - | 0.49 | - | - |
| HCM Control Delay (s) |  | 8 | - | 16.5 | - | - |
| HCM Lane LOS |  | A | - | C | - | - |
| HCM 95th \%tile Q(veh) |  | 0.3 | - | 2.7 | - | - |



|  | $\bigcirc$ | 4 |  |  |  | 1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |  |
| Lane Configurations | ${ }^{7}$ | 「 | $\uparrow$ |  | ${ }^{7}$ | 4 |  |
| Traffic Volume (vph) | 15 | 50 | 540 | 15 | 35 | 625 |  |
| Future Volume (vph) | 15 | 50 | 540 | 15 | 35 | 625 |  |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |  |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.85 | 1.00 |  | 1.00 | 1.00 |  |
| Flt Protected | 0.95 | 1.00 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1488 | 1727 |  | 1662 | 1733 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 |  | 0.38 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1488 | 1727 |  | 669 | 1733 |  |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |  |
| Adj. Flow (vph) | 18 | 59 | 635 | 18 | 41 | 735 |  |
| RTOR Reduction (vph) | 0 | 54 | 1 | 0 | 0 | 0 |  |
| Lane Group Flow (vph) | 18 | 5 | 652 | 0 | 41 | 735 |  |
| Heavy Vehicles (\%) | 0\% | 0\% | 1\% | 0\% | 0\% | 1\% |  |
| Turn Type | Prot | Perm | NA |  | Perm | NA |  |
| Protected Phases | 4 |  | 2 |  |  | 2 |  |
| Permitted Phases |  | 4 |  |  | 2 |  |  |
| Actuated Green, G (s) | 3.2 | 3.2 | 27.9 |  | 27.9 | 27.9 |  |
| Effective Green, g (s) | 3.2 | 3.2 | 28.9 |  | 28.9 | 28.9 |  |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.72 |  | 0.72 | 0.72 |  |
| Clearance Time (s) | 4.0 | 4.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 3.0 | 3.0 | 5.2 |  | 5.2 | 5.2 |  |
| Lane Grp Cap (vph) | 132 | 118 | 1244 |  | 482 | 1248 |  |
| v/s Ratio Prot | c0.01 |  | 0.38 |  |  | c0.42 |  |
| v/s Ratio Perm |  | 0.00 |  |  | 0.06 |  |  |
| v/c Ratio | 0.14 | 0.04 | 0.52 |  | 0.09 | 0.59 |  |
| Uniform Delay, d1 | 17.2 | 17.0 | 2.5 |  | 1.7 | 2.7 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.5 | 0.1 | 0.8 |  | 0.2 | 1.2 |  |
| Delay (s) | 17.6 | 17.2 | 3.3 |  | 1.8 | 3.9 |  |
| Level of Service | B | B | A |  | A | A |  |
| Approach Delay (s) | 17.3 |  | 3.3 |  |  | 3.8 |  |
| Approach LOS | B |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 4.3 |  | HCM 2000 | evel of Service | A |
| HCM 2000 Volume to Capacity ratio |  |  | 0.54 |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 40.1 |  | Sum of los | me (s) | 8.0 |
| Intersection Capacity Utilization |  |  | 46.5\% |  | CU Level | Service | A |
| Analysis Period (min) |  |  | 15 |  |  |  |  |
| C Critical Lane Group |  |  |  |  |  |  |  |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Minor1 | Major1 |  |  | Major2 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 883 | 236 | 0 | 0 | 253 | 0 |  |
| Stage 1 | 236 | - | - | - | - | - |  |
| Stage 2 | 647 | - | - | - | - | - |  |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |  |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |  |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |  |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |  |
| Pot Cap-1 Maneuver | 319 | 808 | - | - | 1324 | - |  |
| Stage 1 | 808 | - | - | - | - | - |  |
| Stage 2 | 525 | - | - | - | - | - |  |
| Platoon blocked, \% |  |  | - | - |  | - |  |
| Mov Cap-1 Maneuver | 262 | 808 | - | - | 1324 | - |  |
| Mov Cap-2 Maneuver | 262 | - | - | - | - | - |  |
| Stage 1 | 663 | - | - | - | - | - |  |
| Stage 2 | 525 | - | - | - | - | - |  |
|  |  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |  |
| HCM Control Delay, s | 15.5 |  | 0 |  | 3.8 |  |  |
| HCM LOS | C |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Minor Lane/Major Mvm |  | NBT | NBR1 | BLn1 | SBL | SBT |  |
| Capacity (veh/h) |  | - | - | 537 | 1324 | - |  |
| HCM Lane V/C Ratio |  | - | - | 0.361 | 0.156 | - |  |
| HCM Control Delay (s) |  | - | - | 15.5 | 8.2 | 0 |  |
| HCM Lane LOS |  | - | - | C | A | A |  |
| HCM 95th \%tile Q(veh) |  | - | - | 1.6 | 0.6 | - |  |


c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |



|  | EB | WB |  |
| :--- | ---: | ---: | ---: |
| Approach |  |  |  |
| HCM Control Delay, s | 9.7 |  |  |
| HCM LOS | A |  |  |
|  |  |  |  |
|  |  |  |  |
| Minor Lane/Major Mvmt | EBLn1 | WBL | WBT |
| Capacity (veh/h) | 818 | - | - |
| HCM Lane V/C Ratio | 0.063 | - | - |
| HCM Control Delay (s) | 9.7 | - | - |
| HCM Lane LOS | A | - | - |
| HCM 95th \%tile Q(veh) | 0.2 | - | - |



C Critical Lane Group

c Critical Lane Group

| Intersection |  |
| :--- | ---: |
| Intersection Delay, s/veh | 8 |
| Intersection LOS | A |


| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Lane Configurations |  | $\uparrow$ | $\uparrow$ |  | Fr |  |
| Traffic Vol, veh/h | 65 | 10 | 20 | 120 | 50 | 105 |
| Future Vol, veh/h | 65 | 10 | 20 | 120 | 50 | 105 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 76 | 12 | 24 | 141 | 59 | 124 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 |
| Approach | EB |  | WB |  | SB |  |
| Opposing Approach | WB | EB |  |  |  |  |
| Opposing Lanes | 1 |  | 1 |  |  |  |
| Conflicting Approach Left SB |  |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  | 0 | 1 |  |  |
| Conflicting Approach Right |  | SB | EB |  |  |  |
| Conflicting Lanes Right | 0 | 1 | 1 |  |  |  |
| HCM Control Delay | 8.2 | 7.7 | 8.2 |  |  |  |


| Lane | EBLn1WBLn1 SBLn1 |  |  |
| :--- | ---: | ---: | ---: |
| Vol Left, \% | $87 \%$ | $0 \%$ | $32 \%$ |
| Vol Thru, \% | $13 \%$ | $14 \%$ | $0 \%$ |
| Vol Right, \% | $0 \%$ | $86 \%$ | $68 \%$ |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 75 | 140 | 155 |
| LT Vol | 65 | 0 | 50 |
| Through Vol | 10 | 20 | 0 |
| RT Vol | 0 | 120 | 105 |
| Lane Flow Rate | 88 | 165 | 182 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.114 | 0.178 | 0.208 |
| Departure Headway (Hd) | 4.632 | 3.884 | 4.098 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 776 | 926 | 877 |
| Service Time | 2.649 | 1.898 | 2.113 |
| HCM Lane V/C Ratio | 0.113 | 0.178 | 0.208 |
| HCM Control Delay | 8.2 | 7.7 | 8.2 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.6 | 0.8 |

Intersection
Intersection Delay, s/veh 7.5
Intersection LOS A

| Movement EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | * |  |  | * |  |  | 4 |  |  | \& |  |
| Traffic Vol, veh/h 1 | 1 | 1 | 5 | 5 | 55 | 1 | 2 | 5 | 90 | 5 | 1 |
| Future Vol, veh/h 1 | 1 | 1 | 5 | 5 | 55 | 1 | 2 | 5 | 90 | 5 | 1 |
| Peak Hour Factor 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow 1 | 1 | 1 | 6 | 6 | 65 | 1 | 2 | 6 | 106 | 6 | 1 |
| Number of Lanes 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach RighNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay 7.1 |  |  | 7 |  |  | 6.9 |  |  | 7.9 |  |  |
| HCM LOS A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $12 \%$ | $33 \%$ | $8 \%$ | $94 \%$ |
| Vol Thru, \% | $25 \%$ | $33 \%$ | $8 \%$ | $5 \%$ |
| Vol Right, \% | $62 \%$ | $33 \%$ | $85 \%$ | $1 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 8 | 3 | 65 | 96 |
| LT Vol | 1 | 1 | 5 | 90 |
| Through Vol | 2 | 1 | 5 | 5 |
| RT Vol | 5 | 1 | 55 | 1 |
| Lane Flow Rate | 9 | 4 | 76 | 113 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.01 | 0.004 | 0.077 | 0.133 |
| Departure Headway (Hd) | 3.775 | 4.037 | 3.621 | 4.227 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 942 | 875 | 977 | 849 |
| Service Time | 1.823 | 2.115 | 1.689 | 2.249 |
| HCM Lane V/C Ratio | 0.01 | 0.005 | 0.078 | 0.133 |
| HCM Control Delay | 6.9 | 7.1 | 7 | 7.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0 | 0.2 | 0.5 |


| Intersection |
| :--- |
| Intersection Delay, s/veh 7.5 |
| Intersection LOS A |


| Movement EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 4 |  |  | * |  |  | 4 |  |  | 4 |  |
| Traffic Vol, veh/h 5 | 10 | 5 | 1 | 10 | 5 | 15 | 45 | 5 | 5 | 80 | 10 |
| Future Vol, veh/h 5 | 10 | 5 | 1 | 10 | 5 | 15 | 45 | 5 | 5 | 80 | 10 |
| Peak Hour Factor 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| Mvmt Flow 6 | 12 | 6 | 1 | 12 | 6 | 18 | 53 | 6 | 6 | 94 | 12 |
| Number of Lanes 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach RighNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay 7.3 |  |  | 7.2 |  |  | 7.5 |  |  | 7.6 |  |  |
| HCM LOS A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $23 \%$ | $25 \%$ | $6 \%$ | $5 \%$ |
| Vol Thru, \% | $69 \%$ | $50 \%$ | $62 \%$ | $84 \%$ |
| Vol Right, \% | $8 \%$ | $25 \%$ | $31 \%$ | $11 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 65 | 20 | 16 | 95 |
| LT Vol | 15 | 5 | 1 | 5 |
| Through Vol | 45 | 10 | 10 | 80 |
| RT Vol | 5 | 5 | 5 | 10 |
| Lane Flow Rate | 76 | 24 | 19 | 112 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.086 | 0.027 | 0.021 | 0.124 |
| Departure Headway (Hd) | 4.058 | 4.138 | 4.066 | 3.979 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 879 | 853 | 867 | 899 |
| Service Time | 2.1 | 2.223 | 2.154 | 2.014 |
| HCM Lane V/C Ratio | 0.086 | 0.028 | 0.022 | 0.125 |
| HCM Control Delay | 7.5 | 7.3 | 7.2 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 0.1 | 0.1 | 0.4 |



C Critical Lane Group




C Critical Lane Group


C Critical Lane Group



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 125 | 0 | - | 0 | 432 | 122 |
| Stage 1 | - | - | - | - | 122 | - |
| Stage 2 | - | - | - | - | 310 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.21 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.309 |
| Pot Cap-1 Maneuver | 1474 | - | - | - | 584 | 932 |
| Stage 1 | - | - | - | - | 908 | - |
| Stage 2 | - | - | - | - | 748 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1474 | - | - | - | 568 | 932 |
| Mov Cap-2 Maneuver | - | - | - | - | 568 | - |
| Stage 1 | - | - | - | - | 883 | - |
| Stage 2 | - | - | - | - | 748 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 1.2 |  | 0 |  | 9.5 |  |
| HCM LOS |  |  |  |  | A |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT | WBT | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1474 | - | - | - | 894 |
| HCM Lane V/C Ratio |  | 0.028 | - | - | - | 0.1 |
| HCM Control Delay (s) |  | 7.5 | - | - | - | 9.5 |
| HCM Lane LOS |  | A | - | - | - | A |
| HCM 95th \%tile Q(veh) |  | 0.1 | - | - | - | 0.3 |










| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 9.8 |  |  |  |  |  |  |  |  |  |  |  |
| Movement E | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | $\uparrow$ |  |  | $\uparrow$ |  | ${ }^{*}$ |  |  |  | $\uparrow$ |  |
| Traffic Vol, veh/h | 0 | 20 | 45 | 185 | 15 | 0 | 70 | 0 | 260 | 0 | 0 | 0 |
| Future Vol, veh/h | 0 | 20 | 45 | 185 | 15 | 0 | 70 | 0 | 260 | 0 | 0 | 0 |
| Conflicting Peds, \#/hr | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control Stop | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | Free | - | - | None |
| Storage Length | - | - | - | - | - | - | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 16974 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 93 | 93 | 93 | 93 | 92 | 93 | 92 | 93 | 92 | 92 | 92 |
| Heavy Vehicles, \% | 2 | 0 | 0 | 0 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 48 | 199 | 16 | 0 | 75 | 0 | 280 | 0 | 0 | 0 |







c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |


| Major/Minor | Major1 |  | Major2 |  | Minor2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 213 | 0 | - | 0 | 340 | 202 |
| Stage 1 | - | - | - | - | 202 | - |
| Stage 2 | - | - | - | - | 138 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1369 | - | - | - | 660 | 844 |
| Stage 1 | - | - | - | - | 837 | - |
| Stage 2 | - | - | - | - | 894 | - |
| Platoon blocked, \% |  | - | - | - |  |  |
| Mov Cap-1 Maneuver | 1369 | - | - | - | 657 | 844 |
| Mov Cap-2 Maneuver | - | - | - | - | 657 | - |
| Stage 1 | - | - | - | - | 833 | - |
| Stage 2 | - | - | - | - | 894 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | SB |  |
| HCM Control Delay, s | 0.3 |  | 0 |  | 10.2 |  |
| HCM LOS |  |  |  |  | B |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | EBL | EBT | WBT | WBR SBLn1 |  |
| Capacity (veh/h) |  | 1369 | - | - | - | 701 |
| HCM Lane V/C Ratio |  | 0.004 | - | - | - | 0.011 |
| HCM Control Delay (s) |  | 7.6 | 0 | - | - | 10.2 |
| HCM Lane LOS |  | A | A | - | - | B |
| HCM 95th \%tile Q(veh) |  | 0 | - | - | - | 0 |


| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |  |
| Lane Configurations | ${ }^{7}$ | $\hat{\beta}$ |  | \% | $\hat{\beta}$ |  |  | ${ }_{\$}$ |  |  | \$ |  |  |
| Traffic Vol, veh/h | 5 | 185 | 15 | 45 | 290 | 15 | 35 | 10 | 30 | 10 | 20 | 2 |  |
| Future Vol, veh/h | 5 | 185 | 15 | 45 | 290 | 15 | 35 | 10 | 30 | 10 | 20 | 2 |  |
| Conflicting Peds, \#/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 |  |
| Sign Control F | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |  |
| RT Channelized | - | - | None | - | - | None | - | - | None | - |  | None |  |
| Storage Length | 40 | - | - | 100 | - | - | - | - | - | - | - | - |  |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |  |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |  |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |  |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| Mvmt Flow | 5 | 201 | 16 | 49 | 315 | 16 | 38 | 11 | 33 | 11 | 22 | 2 |  |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{7}$ | 中 ${ }^{\text {a }}$ |  | \％ | 个t |  |  | $\uparrow$ | 「 | ${ }^{7}$ | $\hat{1}$ |  |
| Traffic Volume（vph） | 20 | 315 | 120 | 395 | 320 | 10 | 170 | 40 | 410 | 45 | 45 | 15 |
| Future Volume（vph） | 20 | 315 | 120 | 395 | 320 | 10 | 170 | 40 | 410 | 45 | 45 | 15 |
| Ideal Flow（vphpl） | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time（s） | 4.0 | 4.0 |  | 4.0 | 4.0 |  |  | 4.0 | 5.0 | 4.0 | 4.0 |  |
| Lane Util．Factor | 1.00 | 0.95 |  | 1.00 | 0.95 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frpb，ped／bikes | 1.00 | 0.99 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Flpb，ped／bikes | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.96 |  | 1.00 | 1.00 |  |  | 1.00 | 0.85 | 1.00 | 0.96 |  |
| Flt Protected | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.96 | 1.00 | 0.95 | 1.00 |  |
| Satd．Flow（prot） | 1662 | 3163 |  | 1646 | 3306 |  |  | 1676 | 1473 | 1662 | 1677 |  |
| Flt Permitted | 0.95 | 1.00 |  | 0.95 | 1.00 |  |  | 0.72 | 1.00 | 0.49 | 1.00 |  |
| Satd．Flow（perm） | 1662 | 3163 |  | 1646 | 3306 |  |  | 1261 | 1473 | 855 | 1677 |  |
| Peak－hour factor，PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj．Flow（vph） | 22 | 339 | 129 | 425 | 344 | 11 | 183 | 43 | 441 | 48 | 48 | 16 |
| RTOR Reduction（vph） | 0 | 36 | 0 | 0 | 2 | 0 | 0 | 0 | 72 | 0 | 10 | 0 |
| Lane Group Flow（vph） | 22 | 432 | 0 | 425 | 353 | 0 | 0 | 226 | 369 | 48 | 54 | 0 |
| Confl．Peds．（\＃／hr） | 7 |  | 8 | 8 |  | 7 | 5 |  |  |  |  | 5 |
| Heavy Vehicles（\％） | 0\％ | 0\％ | 1\％ | 1\％ | 0\％ | 0\％ | 0\％ | 0\％ | 1\％ | 0\％ | 0\％ | 0\％ |
| Turn Type | Split | NA |  | Split | NA |  | Perm | NA | pt＋ov | Perm | NA |  |
| Protected Phases | 2 | 2 |  | 6 | 6 |  |  | 8 | 86 |  | 4 |  |
| Permitted Phases |  |  |  |  |  |  | 8 |  |  | 4 |  |  |
| Actuated Green，G（s） | 15.3 | 15.3 |  | 24.9 | 24.9 |  |  | 17.1 | 47.5 | 17.1 | 17.1 |  |
| Effective Green， g （s） | 15.8 | 15.8 |  | 26.4 | 26.4 |  |  | 18.1 | 42.0 | 18.1 | 18.1 |  |
| Actuated g／C Ratio | 0.22 | 0.22 |  | 0.37 | 0.37 |  |  | 0.25 | 0.58 | 0.25 | 0.25 |  |
| Clearance Time（s） | 4.5 | 4.5 |  | 5.5 | 5.5 |  |  | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension（s） | 2.5 | 2.5 |  | 2.5 | 2.5 |  |  | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap（vph） | 363 | 691 |  | 601 | 1207 |  |  | 315 | 855 | 214 | 419 |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Prot | 0.01 | c0．14 |  | c0．26 | 0.11 |  |  |  | 0.25 |  | 0.03 |  |
| v／s Ratio Perm |  |  |  |  |  |  |  | c0．18 |  | 0.06 |  |  |
| v／c Ratio | 0.06 | 0.63 |  | 0.71 | 0.29 |  |  | 0.72 | 0.43 | 0.22 | 0.13 |  |
| Uniform Delay，d1 | 22.4 | 25.6 |  | 19.6 | 16.3 |  |  | 24.8 | 8.5 | 21.5 | 21.0 |  |
| Progression Factor | 1.00 | 1.00 |  | 1.00 | 1.00 |  |  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| Incremental Delay，d2 | 0.1 | 1.5 |  | 3.5 | 0.1 |  |  | 7.1 | 0.3 | 0.4 | 0.1 |  |
| Delay（s） | 22.4 | 27.1 |  | 23.2 | 16.4 |  |  | 31.9 | 8.7 | 21.9 | 21.1 |  |
| Level of Service | C | C |  | C | B |  |  | C | A | C | C |  |
| Approach Delay（s） |  | 26.9 |  |  | 20.1 |  |  | 16.6 |  |  | 21.4 |  |
| Approach LOS |  | C |  |  | C |  |  | B |  |  | C |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 20.6 |  | HCM 2000 | Level of | ervice |  | C |  |  |  |
| HCM 2000 Control Delay to Capacity ratio |  |  | 0.72 |  |  |  |  |  |  |  |  |  |
| Actuated Cycle Length（s） |  |  | 72.3 |  | Sum of los | time（s） |  |  | 14.5 |  |  |  |
| Intersection Capacity Utilization |  |  | 68．8\％ |  | CU Level | f Service |  |  | C |  |  |  |
| Analysis Period（min） |  |  | 15 |  |  |  |  |  |  |  |  |  |

c Critical Lane Group

c Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 4.9 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | * 4 |  |  | 个 ${ }^{\text {F }}$ |  |  | \$ |  |  | \& |  |
| Traffic Vol, veh/h | 270 | 565 | 0 | 0 | 770 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Future Vol, veh/h | 270 | 565 | 0 | 0 | 770 | 15 | 5 | 1 | 15 | 5 | 0 | 110 |
| Conflicting Peds, \#/hr | 10 | 0 | 11 | 11 | 0 | 10 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 297 | 621 | 0 | 0 | 846 | 16 | 5 | 1 | 16 | 5 | 0 | 121 |




C Critical Lane Group

c Critical Lane Group



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 2.1 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | K |  |  | - | 个 |  |
| Traffic Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Future Vol, veh/h | 30 | 25 | 30 | 150 | 130 | 40 |
| Conflicting Peds, \#/hr | 0 | 0 | 4 | 0 | 0 | 4 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 38 | 32 | 38 | 192 | 167 | 51 |



| Intersection |  |
| :--- | ---: | :--- |
| Intersection Delay, s/veh | 8.1 |
| Intersection LOS | A |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | ¢ |  |  | ¢ |  |  | ${ }_{*}$ |  |  | ${ }_{*}$ |  |
| Traffic Vol, veh/h | 5 | 35 | 30 | 5 | 80 | 10 | 40 | 60 | 5 | 5 | 60 | 5 |
| Future Vol, veh/h | 5 | 35 | 30 | 5 | 80 | 10 | 40 | 60 | 5 | 5 | 60 | 5 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 6 | 41 | 35 | 6 | 93 | 12 | 47 | 70 | 6 | 6 | 70 | 6 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Right | NB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.7 |  |  | 8.1 |  |  | 8.3 |  |  | 8 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $38 \%$ | $7 \%$ | $5 \%$ | $7 \%$ |
| Vol Tru, \% | $57 \%$ | $50 \%$ | $84 \%$ | $86 \%$ |
| Vol Right, \% | $5 \%$ | $43 \%$ | $11 \%$ | $7 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 105 | 70 | 95 | 70 |
| LT Vol | 40 | 5 | 5 | 5 |
| Through Vol | 60 | 35 | 80 | 60 |
| RT Vol | 5 | 30 | 10 | 5 |
| Lane Flow Rate | 122 | 81 | 110 | 81 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.152 | 0.096 | 0.135 | 0.1 |
| Departure Headway (Hd) | 4.47 | 4.249 | 4.404 | 4.44 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 805 | 845 | 815 | 808 |
| Service Time | 2.486 | 2.268 | 2.422 | 2.459 |
| HCM Lane V/C Ratio | 0.152 | 0.096 | 0.135 | 0.1 |
| HCM Control Delay | 8.3 | 7.7 | 8.1 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.5 | 0.3 | 0.5 | 0.3 |


c Critical Lane Group

| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 1.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  | \& |  |  | \& |  | ${ }^{7}$ | 44 |  | ${ }^{*}$ | 44 |  |
| Traffic Vol, veh/h | 10 | 1 | 30 | 5 | 2 | 5 | 65 | 730 | 5 | 2 | 745 | 10 |
| Future Vol, veh/h | 10 | 1 | 30 | 5 | 2 | 5 | 65 | 730 | 5 | 2 | 745 | 10 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 8 | 0 | 2 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | 100 | - | - | 100 | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Mvmt Flow | 11 | 1 | 34 | 6 | 2 | 6 | 74 | 830 | 6 | 2 | 847 | 11 |



c Critical Lane Group


c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 1.1 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | 值 |  |  | - 个 | Mr |  |
| Traffic Vol, veh/h | 610 | 30 | 30 | 670 | 20 | 45 |
| Future Vol, veh/h | 610 | 30 | 30 | 670 | 20 | 45 |
| Conflicting Peds, \#/hr | 0 | 2 | 2 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 663 | 33 | 33 | 728 | 22 | 49 |


| Major/Minor | Major1 |  | Major2 |  | Minor1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 0 | 0 | 698 | 0 | 1112 | 350 |
| Stage 1 | - | - | - | - | 682 | - |
| Stage 2 | - | - | - | - | 430 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 908 | - | 206 | 652 |
| Stage 1 | - | - | - | - | 469 | - |
| Stage 2 | - | - | - | - | 629 | - |
| Platoon blocked, \% | - | - |  | - |  |  |
| Mov Cap-1 Maneuver | - | - | 906 | - | 193 | 651 |
| Mov Cap-2 Maneuver | - | - | - | - | 193 | - |
| Stage 1 | - | - | - | - | 439 | - |
| Stage 2 | - | - | - | - | 629 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | NB |  |
| HCM Control Delay, s | 0 |  | 0.7 |  | 16.8 |  |
| HCM LOS |  |  |  |  | C |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBLn1 | EBT | EBR | WBL | WBT |
| Capacity (veh/h) |  | 376 | - | - | 906 | - |
| HCM Lane V/C Ratio |  | 0.188 | - | - | 0.036 | - |
| HCM Control Delay (s) |  | 16.8 | - | - | 9.1 | 0.3 |
| HCM Lane LOS |  | C | - | - | A | A |
| HCM 95th \%tile Q(veh) |  | 0.7 | - | - | 0.1 | - |


c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 7 | $\uparrow$ | 「 | ${ }^{7}$ | F |  | ${ }^{7}$ | F |  | ${ }^{7}$ | F |  |
| Trafic Volume (vph) | 65 | 435 | 125 | 15 | 495 | 40 | 160 | 125 | 35 | 20 | 95 | 80 |
| Future Volume (vph) | 65 | 435 | 125 | 15 | 495 | 40 | 160 | 125 | 35 | 20 | 95 | 80 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 |  | 1.00 | 0.97 |  | 1.00 | 0.93 |  |
| FIt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1750 | 1454 | 1662 | 1715 |  | 1662 | 1684 |  | 1662 | 1617 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |  | 0.95 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1750 | 1454 | 1662 | 1715 |  | 1662 | 1684 |  | 1662 | 1617 |  |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 70 | 468 | 134 | 16 | 532 | 43 | 172 | 134 | 38 | 22 | 102 | 86 |
| RTOR Reduction (vph) | 0 | 0 | 72 | 0 | 3 | 0 | 0 | 10 | 0 | 0 | 29 | 0 |
| Lane Group Flow (vph) | 70 | 468 | 62 | 16 | 572 | 0 | 172 | 162 | 0 | 22 | 159 | 0 |
| Confl. Peds. (\#/hr) |  |  | 1 | 1 |  |  | 4 |  | 1 | 1 |  | 4 |
| Heavy Vehicles (\%) | 0\% | 0\% | 0\% | 0\% | 1\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
| Turn Type | Prot | NA | Perm | Prot | NA |  | Prot | NA |  | Prot | NA |  |
| Protected Phases | 5 | 2 |  | 1 | 6 |  | 3 | 8 |  | 7 | 4 |  |
| Permitted Phases |  |  | 2 |  |  |  |  |  |  |  |  |  |
| Actuated Green, G (s) | 5.4 | 41.0 | 41.0 | 1.1 | 36.7 |  | 13.1 | 28.2 |  | 1.8 | 16.9 |  |
| Effective Green, g (s) | 5.9 | 41.5 | 41.5 | 1.6 | 37.2 |  | 13.6 | 28.7 |  | 2.3 | 17.4 |  |
| Actuated g/C Ratio | 0.07 | 0.46 | 0.46 | 0.02 | 0.41 |  | 0.15 | 0.32 |  | 0.03 | 0.19 |  |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |  | 4.5 | 4.5 |  | 4.5 | 4.5 |  |
| Vehicle Extension (s) | 2.5 | 6.0 | 6.0 | 2.5 | 6.0 |  | 2.5 | 2.5 |  | 2.5 | 2.5 |  |
| Lane Grp Cap (vph) | 108 | 806 | 669 | 29 | 708 |  | 250 | 536 |  | 42 | 312 |  |
| $\mathrm{v} / \mathrm{s}$ Ratio Prot | c0.04 | 0.27 |  | 0.01 | c0.33 |  | c0.10 | 0.10 |  | 0.01 | c0.10 |  |
| v/s Ratio Perm |  |  | 0.04 |  |  |  |  |  |  |  |  |  |
| v/c Ratio | 0.65 | 0.58 | 0.09 | 0.55 | 0.81 |  | 0.69 | 0.30 |  | 0.52 | 0.51 |  |
| Uniform Delay, d1 | 41.1 | 17.9 | 13.7 | 43.9 | 23.3 |  | 36.2 | 23.2 |  | 43.4 | 32.5 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 11.2 | 2.0 | 0.2 | 16.9 | 8.0 |  | 7.0 | 0.2 |  | 8.7 | 1.0 |  |
| Delay (s) | 52.3 | 19.9 | 13.9 | 60.8 | 31.3 |  | 43.3 | 23.4 |  | 52.1 | 33.5 |  |
| Level of Service | D | B | B | E | C |  | D | C |  | D | C |  |


| Approach Delay (s) | 22.1 | 32.1 | 33.3 | 35.4 |
| :--- | ---: | ---: | ---: | ---: |
| Approach LOS | C | C | C | D |


| Intersection Summary |  |  | C |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 29.0 | HCM 2000 Level of Service |  |
| HCM 2000 Volume to Capacity ratio | 0.70 |  | 16.0 |
| Actuated Cycle Length (s) | 90.1 | Sum of lost time (s) | C |

C Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | ${ }^{*}$ | $\uparrow$ |  |  | \＄ |  | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | \％ | 个 $\uparrow$ | 「 |
| Traffic Volume（vph） | 165 | 1 | 340 | 2 | 5 | 5 | 460 | 930 | 1 | 1 | 885 | 95 |
| Future Volume（vph） | 165 | 1 | 340 | 2 | 5 | 5 | 460 | 930 | 1 | 1 | 885 | 95 |
| Ideal Flow（vphpl） | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time（s） | 5.0 | 4.0 |  |  | 3.5 |  | 4.0 | 4.0 |  | 4.0 | 4.0 | 5.5 |
| Lane Util．Factor | 1.00 | 1.00 |  |  | 1.00 |  | 1.00 | 0.95 |  | 1.00 | 0.95 | 1.00 |
| Frpb，ped／bikes | 1.00 | 1.00 |  |  | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 | 0.97 |
| Flpb，ped／bikes | 1.00 | 1.00 |  |  | 1.00 |  | 1.00 | 1.00 |  | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 |  |  | 0.94 |  | 1.00 | 1.00 |  | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 |  |  | 0.99 |  | 0.95 | 1.00 |  | 0.95 | 1.00 | 1.00 |
| Satd．Flow（prot） | 1646 | 1488 |  |  | 1638 |  | 1662 | 3259 |  | 1662 | 3228 | 1434 |
| Flt Permitted | 0.95 | 1.00 |  |  | 0.86 |  | 0.95 | 1.00 |  | 0.95 | 1.00 | 1.00 |
| Satd．Flow（perm） | 1646 | 1488 |  |  | 1427 |  | 1662 | 3259 |  | 1662 | 3228 | 1434 |
| Peak－hour factor，PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj．Flow（vph） | 168 | 1 | 347 | 2 | 5 | 5 | 469 | 949 | 1 | 1 | 903 | 97 |
| RTOR Reduction（vph） | 0 | 284 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| Lane Group Flow（vph） | 168 | 64 | 0 | 0 | 7 | 0 | 469 | 950 | 0 | 1 | 903 | 36 |
| Confl．Peds．（\＃／hr） |  |  |  |  |  |  | 3 |  |  |  |  | 3 |
| Heavy Vehicles（\％） | 1\％ | 0\％ | 0\％ | 0\％ | 0\％ | 0\％ | 0\％ | 2\％ | 0\％ | 0\％ | 3\％ | 1\％ |
| Turn Type | Prot | NA |  | custom | NA |  | Prot | NA |  | Prot | NA | Perm |
| Protected Phases | 3 |  |  |  |  |  | 1 | 6 |  | 5 | 2 |  |


| Permitted Phases |  | 8 | 4 |  |  |  |  | 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Actuated Green，G（s） | 12.0 | 18.2 | 1.7 | 33.1 | 71.3 | 0.5 | 38.7 | 38.7 |
| Effective Green， g （s） | 12.0 | 19.2 | 2.7 | 34.1 | 72.8 | 1.5 | 40.2 | 38.7 |
| Actuated g／C Ratio | 0.11 | 0.18 | 0.03 | 0.32 | 0.69 | 0.01 | 0.38 | 0.37 |
| Clearance Time（s） | 5.0 | 5.0 | 4.5 | 5.0 | 5.5 | 5.0 | 5.5 | 5.5 |
| Vehicle Extension（s） | 2.5 | 2.5 | 5.0 | 2.5 | 4.8 | 2.5 | 4.8 | 4.8 |
| Lane Grp Cap（vph） | 187 | 270 | 36 | 537 | 2248 | 23 | 1230 | 526 |
| v／s Ratio Prot | c0．10 |  |  | c0．28 | 0.29 | 0.00 | c0． 28 |  |
| v／s Ratio Perm |  | c0．04 | 0.00 |  |  |  |  | 0.02 |
| v／c Ratio | 0.90 | 0.24 | 0.20 | 0.87 | 0.42 | 0.04 | 0.73 | 0.07 |
| Uniform Delay，d1 | 46.1 | 36.9 | 50.3 | 33.7 | 7.2 | 51.3 | 28.1 | 21.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay，d2 | 38.1 | 0.3 | 5.6 | 14.5 | 0.3 | 0.6 | 2.7 | 0.1 |
| Delay（s） | 84.3 | 37.2 | 55.9 | 48.2 | 7.4 | 51.9 | 30.8 | 21.8 |
| Level of Service | F | D | E | D | A | D | C | C |
| Approach Delay（s） |  | 52.5 | 55.9 |  | 20.9 |  | 29.9 |  |
| Approach LOS |  | D | E |  | C |  | C |  |


| Intersection Summary |  |  |  |
| :--- | ---: | :--- | ---: |
| HCM 2000 Control Delay | 29.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 |  |  |
| Actuated Cycle Length（s） | 105.5 | Sum of lost time（s） | 17.5 |
| Intersection Capacity Utilization | $87.1 \%$ | ICU Level of Service | E |
| Analysis Period（min） | 15 |  |  |

C Critical Lane Group



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 5.2 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | $\uparrow$ |  |  | -1 | Y |  |
| Traffic Vol, veh/h | 55 | 1 | 50 | 60 | 5 | 115 |
| Future Vol, veh/h | 55 | 1 | 50 | 60 | 5 | 115 |
| Conflicting Peds, \#/hr | 0 | 2 | 2 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, \% | 2 | 0 | 0 | 2 | 0 | 0 |
| Mvmt Flow | 61 | 1 | 56 | 67 | 6 | 128 |


| Major/Minor M | Major1 |  | Major2 |  | Minor1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 0 | 0 | 64 | 0 | 243 | 64 |
| Stage 1 | - |  | - | - | 64 | - |
| Stage 2 | - | - | - | - | 179 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1551 | - | 750 | 1006 |
| Stage 1 | - | - | - | - | 964 | - |
| Stage 2 | - | - | - | - | 857 | - |
| Platoon blocked, \% | - | - |  | - |  |  |
| Mov Cap-1 Maneuver | - | - | 1548 | - | 720 | 1004 |
| Mov Cap-2 Maneuver | - | - | - | - | 720 | - |
| Stage 1 | - | - | - | - | 925 | - |
| Stage 2 | - | - | - | - | 857 | - |
|  |  |  |  |  |  |  |
| Approach | EB |  | WB |  | NB |  |
| HCM Control Delay, s | 0 |  | 3.4 |  | 9.2 |  |
| HCM LOS |  |  |  |  | A |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBLn1 | EBT | EBR | WBL | WBT |
| Capacity (veh/h) |  | 988 | - | - | 1548 | - |
| HCM Lane V/C Ratio |  | 0.135 | - | - | 0.036 | - |
| HCM Control Delay (s) |  | 9.2 | - | - | 7.4 | 0 |
| HCM Lane LOS |  | A | - | - | A | A |
| HCM 95th \%tile Q(veh) |  | 0.5 | - | - | 0.1 | - |





C Critical Lane Group


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.9 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | F |  |  | -1 |
| Traffic Vol, veh/h | 40 | 2 | 445 | 45 | 5 | 390 |
| Future Vol, veh/h | 40 | 2 | 445 | 45 | 5 | 390 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 2 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 1 |
| Mvmt Flow | 43 | 2 | 473 | 48 | 5 | 415 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 924 | 499 | 0 | 0 | 523 | 0 |
| Stage 1 | 499 | - | - | - | - | - |
| Stage 2 | 425 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 302 | 576 | - | - | 1054 | - |
| Stage 1 | 614 | - | - | - | - | - |
| Stage 2 | 664 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 300 | 575 | - | - | 1052 | - |
| Mov Cap-2 Maneuver | 300 | - | - | - | - | - |
| Stage 1 | 609 | - | - | - | - | - |
| Stage 2 | 664 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 18.7 |  | 0 |  | 0.1 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRWBLn1 |  | SBL | SBT |
| Capacity (veh/h) |  | - | - | 307 | 1052 | - |
| HCM Lane V/C Ratio |  | - | - | 0.146 | 0.005 | - |
| HCM Control Delay (s) |  | - | - | 18.7 | 8.4 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 0.5 | 0 | - |




| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 6.4 |  |  |  |  |  |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Mr |  |  | A | F |  |
| Traffic Vol, veh/h | 75 | 195 | 110 | 235 | 190 | 35 |
| Future Vol, veh/h | 75 | 195 | 110 | 235 | 190 | 35 |
| Conflicting Peds, \#/hr | 1 | 0 | 1 | 0 | 0 | 1 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | 60 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 0 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, \% | 0 | 0 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 82 | 214 | 121 | 258 | 209 | 38 |




|  | 7 |  |  |  |  | $\downarrow$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |  |
| Lane Configurations | ${ }^{7}$ | 「 | $\uparrow$ |  | ${ }^{7}$ | 4 |  |
| Traffic Volume (vph) | 15 | 50 | 560 | 15 | 35 | 645 |  |
| Future Volume (vph) | 15 | 50 | 560 | 15 | 35 | 645 |  |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |  |
| Total Lost time (s) | 4.0 | 4.0 | 4.0 |  | 4.0 | 4.0 |  |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Frt | 1.00 | 0.85 | 1.00 |  | 1.00 | 1.00 |  |
| Flt Protected | 0.95 | 1.00 | 1.00 |  | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 1662 | 1488 | 1727 |  | 1662 | 1733 |  |
| Flt Permitted | 0.95 | 1.00 | 1.00 |  | 0.37 | 1.00 |  |
| Satd. Flow (perm) | 1662 | 1488 | 1727 |  | 645 | 1733 |  |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |  |
| Adj. Flow (vph) | 18 | 59 | 659 | 18 | 41 | 759 |  |
| RTOR Reduction (vph) | 0 | 54 | 1 | 0 | 0 | 0 |  |
| Lane Group Flow (vph) | 18 | 5 | 676 | 0 | 41 | 759 |  |
| Heavy Vehicles (\%) | 0\% | 0\% | 1\% | 0\% | 0\% | 1\% |  |
| Turn Type | Prot | Perm | NA |  | Perm | NA |  |
| Protected Phases | 4 |  | 2 |  |  | 2 |  |
| Permitted Phases |  | 4 |  |  | 2 |  |  |
| Actuated Green, G (s) | 3.2 | 3.2 | 27.9 |  | 27.9 | 27.9 |  |
| Effective Green, g (s) | 3.2 | 3.2 | 28.9 |  | 28.9 | 28.9 |  |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.72 |  | 0.72 | 0.72 |  |
| Clearance Time (s) | 4.0 | 4.0 | 5.0 |  | 5.0 | 5.0 |  |
| Vehicle Extension (s) | 3.0 | 3.0 | 5.2 |  | 5.2 | 5.2 |  |
| Lane Grp Cap (vph) | 132 | 118 | 1244 |  | 464 | 1248 |  |
| v/s Ratio Prot | c0.01 |  | 0.39 |  |  | c0.44 |  |
| v/s Ratio Perm |  | 0.00 |  |  | 0.06 |  |  |
| v/c Ratio | 0.14 | 0.04 | 0.54 |  | 0.09 | 0.61 |  |
| Uniform Delay, d1 | 17.2 | 17.0 | 2.6 |  | 1.7 | 2.8 |  |
| Progression Factor | 1.00 | 1.00 | 1.00 |  | 1.00 | 1.00 |  |
| Incremental Delay, d2 | 0.5 | 0.1 | 0.9 |  | 0.2 | 1.3 |  |
| Delay (s) | 17.6 | 17.2 | 3.5 |  | 1.9 | 4.1 |  |
| Level of Service | B | B | A |  | A | A |  |
| Approach Delay (s) | 17.3 |  | 3.5 |  |  | 4.0 |  |
| Approach LOS | B |  | A |  |  | A |  |
| Intersection Summary |  |  |  |  |  |  |  |
| HCM 2000 Control DelayHCM 2000 Volume to Capacity ratio |  |  | 4.4 |  | HCM 2000 | evel of Service | A |
|  |  |  | 0.56 |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 40.1 |  | Sum of los | me (s) | 8.0 |
| Intersection Capacity Utilization |  |  | 47.7\% |  | CU Level | Service | A |
| Analysis Period (min) |  |  | 15 |  |  |  |  |
| c Critical Lane Group |  |  |  |  |  |  |  |


| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 5.4 |  |  |  |  |  |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | Mr |  | $\uparrow$ |  |  | $\uparrow$ |
| Traffic Vol, veh/h | 40 | 130 | 190 | 30 | 180 | 200 |
| Future Vol, veh/h | 40 | 130 | 190 | 30 | 180 | 200 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, \# | 0 | - | 0 | - | - | 0 |
| Grade, \% | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 85 | 85 | 85 | 85 | 85 | 85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 47 | 153 | 224 | 35 | 212 | 235 |


| Major/Minor | Minor1 |  | Major1 |  | Major2 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 901 | 242 | 0 | 0 | 259 | 0 |
| Stage 1 | 242 | - | - | - | - | - |
| Stage 2 | 659 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 311 | 802 | - | - | 1317 | - |
| Stage 1 | 803 | - | - | - | - | - |
| Stage 2 | 518 | - | - | - | - | - |
| Platoon blocked, \% |  |  | - | - |  | - |
| Mov Cap-1 Maneuver | 253 | 802 | - | - | 1317 | - |
| Mov Cap-2 Maneuver | 253 | - | - | - | - | - |
| Stage 1 | 654 | - | - | - | - | - |
| Stage 2 | 518 | - | - | - | - | - |
|  |  |  |  |  |  |  |
| Approach | WB |  | NB |  | SB |  |
| HCM Control Delay, s | 15.8 |  | 0 |  | 3.9 |  |
| HCM LOS | C |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Minor Lane/Major Mvmt |  | NBT | NBRV | VBLn1 | SBL |  |
| Capacity (veh/h) |  | - | - | 531 | 1317 | - |
| HCM Lane V/C Ratio |  | - | - | 0.377 | 0.161 | - |
| HCM Control Delay (s) |  | - | - | 15.8 | 8.3 | 0 |
| HCM Lane LOS |  | - | - | C | A | A |
| HCM 95th \%tile Q(veh) |  | - | - | 1.7 | 0.6 | - |



| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 0.6 |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | $\mathbf{T}$ | A | $\mathbf{-}$ |  |  |
| Traffic Vol, veh/h | 0 | 45 | 450 | 195 | 0 | 0 |
| Future Vol, veh/h | 0 | 45 | 450 | 195 | 0 | 0 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 2 | 0 |
| Sign Control | Stop | Stop | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 0 | - | - | - |
| Veh in Median Storage, \# | 0 | - | - | 0 | 16974 | - |
| Grade, \% | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, \% | 0 | 2 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 51 | 511 | 222 | 0 | 0 |


| Major/Minor | Minor2 | Major2 |  |  |
| :--- | ---: | ---: | ---: | :--- |
| Conflicting Flow All | - | 222 | 0 | 0 |
| $\quad$ Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | 6.22 | 4.1 | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | 3.318 | 2.2 | - |
| Pot Cap-1 Maneuver | 0 | 818 | - | - |
| $\quad$ Stage 1 | 0 | - | - | - |
| $\quad$ Stage 2 | 0 | - | - | - |
| Platoon blocked, \% |  |  |  | - |
| Mov Cap-1 Maneuver | 0 | 818 | - | - |
| Mov Cap-2 Maneuver | 0 | - | - | - |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
|  |  |  |  |  |


| Approach | EB | WB |  |
| :--- | ---: | ---: | ---: |
| HCM Control Delay, s | 9.7 |  |  |
| HCM LOS | A |  |  |
|  |  |  |  |
|  |  |  |  |
| Minor Lane/Major Mvmt | EBLn1 | WBL | WBT |
| Capacity (veh/h) | 818 | - | - |
| HCM Lane V/C Ratio | 0.063 | - | - |
| HCM Control Delay (s) | 9.7 | - | - |
| HCM Lane LOS | A | - | - |
| HCM 95th \%tile Q(veh) | 0.2 | - | - |


c Critical Lane Group

c Critical Lane Group

| Intersection |
| :--- |
| Intersection Delay, s/veh 8.4 |
| Intersection LOS |


| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Lane Configurations |  | $\uparrow$ | $\uparrow$ |  | Fr |  |
| Traffic Vol, veh/h | 90 | 10 | 25 | 160 | 50 | 110 |
| Future Vol, veh/h | 90 | 10 | 25 | 160 | 50 | 110 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 106 | 12 | 29 | 188 | 59 | 129 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 |
| Approach | EB |  | WB |  | SB |  |
| Opposing Approach | WB | EB |  |  |  |  |
| Opposing Lanes | 1 |  | 1 | 0 |  |  |
| Conflicting Approach Left SB |  |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  | 0 | 1 |  |  |
| Conflicting Approach Right |  | SB | EB |  |  |  |
| Conflicting Lanes Right | 0 | 1 | 1 |  |  |  |
| HCM Control Delay | 8.6 | 8.2 | 8.5 |  |  |  |


| Lane | EBLn1WBLn1 SBLn1 |  |  |
| :--- | ---: | ---: | ---: |
| Vol Left, \% | $90 \%$ | $0 \%$ | $31 \%$ |
| Vol Thru, \% | $10 \%$ | $14 \%$ | $0 \%$ |
| Vol Right, \% | $0 \%$ | $86 \%$ | $69 \%$ |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 100 | 185 | 160 |
| LT Vol | 90 | 0 | 50 |
| Through Vol | 10 | 25 | 0 |
| RT Vol | 0 | 160 | 110 |
| Lane Flow Rate | 118 | 218 | 188 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.154 | 0.238 | 0.223 |
| Departure Headway (Hd) | 4.718 | 3.941 | 4.267 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 761 | 912 | 843 |
| Service Time | 2.742 | 1.961 | 2.288 |
| HCM Lane V/C Ratio | 0.155 | 0.239 | 0.223 |
| HCM Control Delay | 8.6 | 8.2 | 8.5 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.5 | 0.9 | 0.9 |

Intersection
Intersection Delay, s/veh 7.6 A
Intersection LOS A


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $17 \%$ | $45 \%$ | $7 \%$ | $88 \%$ |
| Vol Thru, \% | $50 \%$ | $9 \%$ | $7 \%$ | $10 \%$ |
| Vol Right, \% | $33 \%$ | $45 \%$ | $86 \%$ | $2 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 30 | 11 | 70 | 102 |
| LT Vol | 5 | 5 | 5 | 90 |
| Through Vol | 15 | 1 | 5 | 10 |
| RT Vol | 10 | 5 | 60 | 2 |
| Lane Flow Rate | 35 | 13 | 82 | 120 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.039 | 0.015 | 0.084 | 0.142 |
| Departure Headway (Hd) | 3.992 | 4.051 | 3.678 | 4.258 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 889 | 869 | 958 | 840 |
| Service Time | 2.051 | 2.145 | 1.763 | 2.292 |
| HCM Lane V/C Ratio | 0.039 | 0.015 | 0.086 | 0.143 |
| HCM Control Delay | 7.2 | 7.2 | 7.1 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0 | 0.3 | 0.5 |

Intersection

$\frac{\text { Intersection Delay, s/veh } 7.6}{}$| Intersection LOS A |
| :--- |


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations |  | ¢ |  |  | ¢ |  |  | $\uparrow$ |  |  | ¢ |  |
| Traffic Vol, veh/h | 5 | 15 | 5 | 1 | 10 | 5 | 20 | 65 | 5 | 5 | 80 | 10 |
| Future Vol, veh/h | 5 | 15 | 5 | 1 | 10 | 5 | 20 | 65 | 5 | 5 | 80 | 10 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles, \% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| Mvmt Flow | 6 | 18 | 6 | 1 | 12 | 6 | 24 | 76 | 6 | 6 | 94 | 12 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Approach | EB |  |  | WB |  |  | NB |  |  | SB |  |  |
| Opposing Approach | WB |  |  | EB |  |  | SB |  |  | NB |  |  |
| Opposing Lanes | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Left | SB |  |  | NB |  |  | EB |  |  | WB |  |  |
| Conflicting Lanes Left | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| Conflicting Approach Righ | hNB |  |  | SB |  |  | WB |  |  | EB |  |  |
| Conflicting Lanes Right | 1 |  |  | 1 |  |  | 1 |  |  | 1 |  |  |
| HCM Control Delay | 7.5 |  |  | 7.3 |  |  | 7.7 |  |  | 7.6 |  |  |
| HCM LOS | A |  |  | A |  |  | A |  |  | A |  |  |


| Lane | NBLn1 EBLn1WBLn1 SBLn1 |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Vol Left, \% | $22 \%$ | $20 \%$ | $6 \%$ | $5 \%$ |
| Vol Thru, \% | $72 \%$ | $60 \%$ | $62 \%$ | $84 \%$ |
| Vol Right, \% | $6 \%$ | $20 \%$ | $31 \%$ | $11 \%$ |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 90 | 25 | 16 | 95 |
| LT Vol | 20 | 5 | 1 | 5 |
| Through Vol | 65 | 15 | 10 | 80 |
| RT Vol | 5 | 5 | 5 | 10 |
| Lane Flow Rate | 106 | 29 | 19 | 112 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.12 | 0.035 | 0.022 | 0.125 |
| Departure Headway (Hd) | 4.079 | 4.31 | 4.226 | 4.011 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 874 | 836 | 852 | 889 |
| Service Time | 2.13 | 2.31 | 2.227 | 2.061 |
| HCM Lane V/C Ratio | 0.121 | 0.035 | 0.022 | 0.126 |
| HCM Control Delay | 7.7 | 7.5 | 7.3 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.4 | 0.1 | 0.1 | 0.4 |



C Critical Lane Group



| Movement | EBT | EBR | EBR2 | WBL2 | WBL | WBT | SBL2 | SBL | SBT | SBR |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lane Configurations | 性 |  |  |  | ${ }^{*}$ | $\uparrow$ | \% | ${ }^{1 *}$ | $\hat{\dagger}$ |  |
| Trafic Volume (vph) | 175 | 55 | 5 | 175 | 15 | 100 | 285 | 1355 | 145 | 70 |
| Future Volume (vph) | 175 | 55 | 5 | 175 | 15 | 100 | 285 | 1355 | 145 | 70 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Total Lost time (s) | 4.0 |  |  |  | 4.5 | 4.0 | 4.0 | 4.0 | 5.5 |  |
| Lane Util. Factor | 0.95 |  |  |  | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 |  |
| Frpb, ped/bikes | 0.99 |  |  |  | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 |  |
| Flpb, ped/bikes | 1.00 |  |  |  | 0.99 | 1.00 | 0.99 | 1.00 | 1.00 |  |
| Frt | 0.96 |  |  |  | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 |  |
| FIt Protected | 1.00 |  |  |  | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 |  |
| Satd. Flow (prot) | 3141 |  |  |  | 1587 | 1750 | 1611 | 3225 | 1631 |  |
| Flt Permitted | 1.00 |  |  |  | 0.60 | 1.00 | 0.95 | 0.95 | 1.00 |  |
| Satd. Flow (perm) | 3141 |  |  |  | 997 | 1750 | 1611 | 3225 | 1631 |  |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 186 | 59 | 5 | 186 | 16 | 106 | 303 | 1441 | 154 | 74 |
| RTOR Reduction (vph) | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 248 | 0 | 0 | 0 | 202 | 106 | 303 | 1441 | 210 | 0 |
| Confl. Peds. (\#/hr) |  | 8 | 8 | 8 | 8 |  | 12 | 12 |  | 1 |
| Heavy Vehicles (\%) | 1\% | 0\% | 2\% | 2\% | 19\% | 0\% | 2\% | 0\% | 2\% | 0\% |
| Turn Type | NA |  |  | Perm | Perm | NA | Perm | Split | NA |  |
| Protected Phases | 8 |  |  |  |  | 4 |  | 2 | 2 |  |
| Permitted Phases |  |  |  | 4 | , |  | 2 |  |  |  |
| Actuated Green, G (s) | 19.1 |  |  |  | 19.1 | 19.1 | 40.9 | 40.9 | 40.9 |  |
| Effective Green, g (s) | 19.6 |  |  |  | 19.1 | 19.6 | 42.4 | 42.4 | 40.9 |  |
| Actuated g/C Ratio | 0.28 |  |  |  | 0.27 | 0.28 | 0.61 | 0.61 | 0.58 |  |
| Clearance Time (s) | 4.5 |  |  |  | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 |  |
| Vehicle Extension (s) | 2.5 |  |  |  | 2.5 | 2.5 | 6.1 | 6.1 | 6.1 |  |
| Lane Grp Cap (vph) | 879 |  |  |  | 272 | 490 | 975 | 1953 | 952 |  |
| v/s Ratio Prot | 0.08 |  |  |  |  | 0.06 |  | c0.45 | 0.13 |  |
| v/s Ratio Perm |  |  |  |  | c0.20 |  | 0.19 |  |  |  |
| v/c Ratio | 0.28 |  |  |  | 0.74 | 0.22 | 0.31 | 0.74 | 0.22 |  |
| Uniform Delay, d1 | 19.7 |  |  |  | 23.2 | 19.3 | 6.7 | 9.8 | 6.9 |  |
| Progression Factor | 1.00 |  |  |  | 0.30 | 0.24 | 1.14 | 1.31 | 1.05 |  |
| Incremental Delay, d2 | 0.1 |  |  |  | 8.9 | 0.1 | 0.7 | 2.2 | 0.5 |  |
| Delay (s) | 19.8 |  |  |  | 16.0 | 4.7 | 8.4 | 15.1 | 7.8 |  |
| Level of Service | B |  |  |  | B | A | A | B | A |  |
| Approach Delay (s) | 19.8 |  |  |  |  | 12.1 |  |  | 13.2 |  |
| Approach LOS | B |  |  |  |  | B |  |  | B |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |
| HCM 2000 Control Delay |  |  | 13.7 |  | HCM 2000 | evel of | ervice |  | B |  |
| HCM 2000 Volume to Capacity ratio |  |  | 0.75 |  |  |  |  |  |  |  |
| Actuated Cycle Length (s) |  |  | 70.0 |  | Sum of los | ime (s) |  |  | 9.5 |  |
| Intersection Capacity Utilization |  |  | 75.3\% |  | CU Level | Service |  |  | D |  |
| Analysis Period (min) |  |  | 15 |  |  |  |  |  |  |  |

C Critical Lane Group

c Critical Lane Group

| Intersection |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Int Delay, s/veh | 1.5 |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations |  | $\uparrow$ | $\uparrow$ |  | F |  |
| Traffic Vol, veh/h | 50 | 265 | 355 | 5 | 5 | 55 |
| Future Vol, veh/h | 50 | 265 | 355 | 5 | 5 | 55 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, \# | - | 0 | 0 | - | 0 | - |
| Grade, \% | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, \% | 0 | 2 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 57 | 305 | 408 | 6 | 6 | 63 |



|  |  | Intersection |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 2.3 |  |  |  |  |  |
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ${ }^{7}$ | + | $\uparrow$ |  | * |  |
| Traffic Vol, veh/h | 35 | 200 | 110 | 5 | 5 | 70 |
| Future Vol, veh/h | 35 | 200 | 110 | 5 | 5 | 70 |
| Conflicting Peds, \#/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control Fros | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length 1 | 140 | - | - | - | 0 | - |
| Veh in Median Storage, \# | \# | 0 | 0 | - | 0 | - |
| Grade, \% | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 84 | 84 | 84 | 84 | 84 | 84 |
| Heavy Vehicles, \% | 0 | 3 | 4 | 0 | 0 | 1 |
| Mvmt Flow | 42 | 238 | 131 | 6 | 6 | 83 |



| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay，s／veh | 0.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR |  |  |  |  |  |  |  |  |  |  |  |  |
| Lane Configurations |  | 个 |  |  |  |  |  |  |  |  | 个瑯 |  |
| Traffic Vol，veh／h | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 1040 | 15 |
| Future Vol，veh／h | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 1040 | 15 |
| Conflicting Peds，\＃／hr | 5 | 0 | 2 | 2 | 0 | 5 | 12 | 0 | 2 | 2 | 0 | 12 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | － | － | None | － | － | None | － | － | None | － | － | None |
| Storage Length | － | － | － | － | － | － | － | － | － | － | － | － |
| Veh in Median Storage，\＃ | \＃ | 0 | － |  | 16983 | － | － | 16983 | － | － | 0 | － |
| Grade，\％ | － | 0 | － | － | 0 | － | － | 0 | － | － | 0 | － |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles，\％ | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 1130 | 16 |











Annの1 $\quad$ (
Preliminary Signal vvailaili Aliaysis

## Oregon Department of Transportation

## Transportation Development Branch

Transportation Planning Analysis Unit
Preliminary Traffic Signal Warrant Analysis ${ }^{1}$


| Case B: Interruption of Continuous Traffic |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 1 | 13300 | 9300 | 1350 | 950 |
| 2 or more | 1 | 15900 | 11100 | 1350 | 950 |
| 2 or more | 2 or more | 15900 | 11100 | 1750 | 1250 |
| 1 | 2 or more | 13300 | 9300 | 1750 | 1250 |
| $\mathbf{X}$ | 100 percent of standard warrants |  |  |  |  |
|  |  |  |  |  |  |
| percent of standard warrants ${ }^{2}$ |  |  |  |  |  |

Preliminary Signal Warrant Calculation

|  | Street | Number of <br> Lanes | Warrant <br> Volumes | Approach <br> Volumes | Warrant Met |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Case <br> A | Major | 2 or more | 10600 | 16842 | N |
|  | Minor | 1 | 2650 | 147 |  |
| Case |  |  |  |  |  |
| B | Major | 2 or more | 15900 | 16842 | N |
|  | Minor | 1 | 1350 | 147 |  |
| Analyst and Date: |  |  |  |  |  |

${ }^{1}$ Meeting preliminary signal warrants does not guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.
${ }^{2}$ Used due to 85 th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#8:
System Alternatives

# REVISED TECHNICAL MEMORANDUM \#8 System Alternatives (Task 7.5) 

Date: August 20, 2019
To: $\quad$ City of Coos Bay
City of North Bend
Oregon Department of Transportation, Region 3
From: Angela Rogge, PE and Dana Shuff, EIT, David Evans and Associates, Inc.
Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
The initial System Alternatives Memorandum is intended to be part of an interactive process to develop a menu of potential improvements prioritized into financially constrained and aspirational project lists. Additional stakeholder feedback, funding forecasts, and fatal flaw analysis will help to refine the list presented in this report. The refined list will eventually be included in the draft TSPs.

This memorandum outlines potential conceptual alternatives to address transportation needs identified previously in the evaluation of existing and future conditions. The suggested transportation guidelines provide the framework for future development of the transportation system, while the potential alternatives work to address identified deficiencies in connectivity, amenities, safety, and operations.

Through an iterative process, the alternatives presented in this document will become a collection of improvements that best achieve the Cities' goals and objectives, while considering the anticipated available funding. As summarized in the timeline below, the draft alternatives will be refined through stakeholder feedback and eventually result in "Financially Feasible" and "Illustrative" project lists for inclusion in the TSPs.


## Transportation Tools and Guidelines

This section highlights current best practices, tools and guidelines that guide the alternatives development and selection for the TSP Updates.

## Transportation System Management (TSM)

TSM measures are designed to make maximum use of existing transportation facilities. Efficient management of the transportation system can reduce costs by avoiding the need for more expensive roadway expansion projects. TSM strategies include traffic control improvements, traffic signal coordination, traffic calming, access management, local street connectivity, and intelligent transportation systems (ITS).

Traffic Calming: Uses physical design and other measures to improve safety for motorists, pedestrians and cyclists. It aims to encourage safer, more responsible driving and potentially reduce traffic flow. Examples: bike boulevard/neighborhood greenway, neighborhood traffic circle, curb bulb-outs (roadway narrowing), and raised crosswalks/medians.

Access Management: Includes the management of vehicular access points to enhance safety and potentially improve traffic operations. Examples: access and driveway spacing standards, channelized turn lanes, median treatments, and turn restrictions.

Intelligent Transportation Systems (ITS): Includes collecting and conveying information regarding roadway operations to improve the operations and efficiency of a facility. ITS can also be used to boost tourism by directing visitors to community features, parking areas, and alternate travel routes. Examples: variable message signs, adaptive signal timing, and variable speed limit signs.

The proposed alternatives outlined in this memorandum include projects that support TSM, such as improved bicycle wayfinding, access management, mid-block crossings, and bicycle sharrows (pavement marking indicating bikes share road with motorists - see TSM Toolbox below).

## TSM Toolbox

This section provides a "toolbox" of alternatives to address multimodal connectivity and neighborhood traffic related concerns. This toolbox provides guidance to the Cities on various tools that could be implemented as needs arise and when funding is available.



## Transportation Demand Management (TDM)

Transportation Demand Management (TDM) measures include various strategies that change travel behavior (how, when and where people travel) in order to increase efficiency and achieve specific planning objectives. TDM measures encourage the use of alternative, non-single-occupancy-vehicle travel modes by serving as a model for businesses and institutions in the community. Changing travel behavior and providing alternative mode choices will help accommodate growth by reducing the need to build new or expanded roadways.

Potential projects such as sidewalks, bicycle routes and transit enhancements, which support TDM, are detailed as part of the Transportation System Alternatives section. However, other TDM strategies described below should be pursued as well.

TDM measures that could be applicable for North Bend and Coos Bay include:

- Employer sponsored flexible or alternative work schedules
- Investing in pedestrian/bicycle facilities and amenities
- Improved amenities and access for transit stops
- Mass communication/marketing to increase awareness of transportation options
- Safe routes to school


## Street Functional Classification

Street functional classification indicates purpose, design and function. The assigned functional classification ensures a street network with features that support demand from both the surrounding land uses and travel needs at a regional level.

## Consistency with Federal Naming Conventions

It is important to align Coos Bay and North Bend's functional classification naming conventions with federal naming conventions as it may facilitate future efforts to obtain federal funding for local improvement projects. Suggested updates to the Cities' classification designations are shown in Table 1.

The Cities' previous TSPs have a "Neighborhood Route" classification. The proposed classification change would differentiate between major and minor collectors.

Table 1. Proposed Functional Classification Naming Conventions
Existing Classification Name Proposed Classification Name

| Principal Arterial (ODOT) | Principal Arterial (ODOT) |
| :---: | :---: |
| Minor Arterial (ODOT) | Minor Arterial (ODOT) |
| Arterial | Arterial |
| Collector | Major Collector |
| Neighborhood Route | Minor Collector |
| Local | Local |

Bold indicates a proposed change in classification

## Suggested Functional Classification System

The suggested functional classification system for roadways in North Bend and Coos Bay is described below. The functional classification map, Figure 1, shows the suggested classification for all roadways in the city, including new street extensions proposed as part of the Street Connectivity plan.

General descriptions of the classifications include:
Principal Arterials are typically freeways and state highways that provide the highest level of connectivity. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterials or collectors.

Arterial streets serve to interconnect and support the principal arterial highway system and are often used as a transition between Principal Arterials and Collectors. These streets link major commercial, residential, industrial and institutional areas.

Major Collector streets provide both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.

Minor Collector streets serve mostly residential or mixed land uses. While through traffic connectivity is not a typical function, they may carry limited amounts.

Local streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

Depending on the road characteristics and function, neighborhood traffic management measures may be appropriate. However, it should not be construed that these routes automatically get speed cushions or any other measures. While these treatments can be beneficial, neighborhood traffic management is only one means of retaining neighborhood character and vitality.

## Suggested Functional Classification Changes

Table 2 summarizes the suggested changes to the existing functional classification of specific streets in North Bend and Coos Bay.

Table 2. Proposed City Functional Classification Changes for Existing Streets

| Street | Existing City <br> Functional Classification | Proposed Functional Classification | City |
| :---: | :---: | :---: | :---: |
| Arthur Street: Colorado Ave to Virginia Ave | Collector | Minor Collector | North Bend |
| Colorado Ave: Arthur St to West End | Local | Major Collector | North Bend |
| Koosbay Blvd: 10th St to US 101 | Arterial | Major Collector | Coos Bay |

Note: All streets currently classified as Collectors are proposed to become Major Collectors and all streets currently classified as Neighborhood Routes are proposed to become Minor Collectors unless otherwise noted in this table.

:-....: Urban Growth Boundary (UGB)



Data Sources:
Cities of North Bend and Coos Bay Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

Figure 1. Proposed Functional Classification Plan

## Transportation System Alternatives

The following section presents draft multimodal system alternatives to address transportation needs across all modes. Included is a summary of the process used to develop and evaluate the alternatives, descriptions of the alternatives and a qualitative evaluation of their potential impacts.

## Alternatives Development Process

The conceptual improvements and strategies identified for consideration in the TSP were developed using guidance provided by the goals and objectives with input from the following sources:

- Projects in 2004 TSPs and other Local and Regional Plans (Technical Memorandum \#1)
- New Projects based on identified deficiencies and feedback from TSP public and advisory committees
- Evaluation of the existing and future deficiencies and needs (Technical Memorandum \#4, \#6 and \#7)


## Summary of Alternatives

This section provides detailed descriptions of the conceptual alternatives developed to address existing and anticipated future deficiencies within the Coos Bay and North Bend UGBs. In instances where there are multiple choices to address deficiencies, options are provided for consideration of the project team to determine the preferred concept for the Draft TSP.

The conceptual alternatives are organized by project type. Each alternative lists a location, description, primary funding Source (decision-maker/lead) and modal need the alternative addresses. The North Bend Draft Alternatives are summarized by mode in Table 5 (page 11), and the Coos Bay Draft Alternatives are summarized by mode in Table 6 (page 15). All alternatives are summarized in Figure 2 (Page 10). If an alternative addresses multiple modal deficiencies, it is listed under the mode that is expected to have the greatest benefit. The additional modal needs it addresses is noted as well.

## Solutions Evaluation and Refinement

As part of the iterative process to determine the preferred concepts for the TSPs, a preliminary evaluation was done to screen and prioritize the alternatives. The following measures were used to evaluate and refine the draft list of alternatives. Additional refinement will occur through coordination with Agency staff and stakeholders.

## Preliminary Planning-Level Cost Opinion

Preliminary planning level cost estimates were developed for each potential TSP project and are expressed in 2019 dollars. The cost estimates are based on professional experience, generalized unit costs and contingency factors (mobilization, traffic control, and engineering/design). If an alternative's extents and scope have yet to be defined, a cost estimate is not provided. Costs do not include right-ofway, utility relocation, new utilities or hazmat costs. Costs may change during refinement of project design.

## Benefits and Impacts Qualitative Assessment

For each alternative, the environmental constraints are noted as well as a qualitative identification of the benefits/impacts to:

- Bicycle and pedestrian facilities and network
- Transit system
- Aviation and freight networks
- Land use
- Mobility
- Safety
- Environmental and cultural resources
- Title VI and Environmental Justice populations
- ADA compliance (if applicable)

The evaluation noted what kind of benefit/impact the proposed alternative is expected to have on the various systems (e.g. positive (+), neutral (/), negative (-)). If the project extents are loosely defined or there were multiple options, the benefits/impacts are listed as to be determined (TBD).

## Goals and Objectives Evaluation Rating/Need

A broad set of evaluation criteria that represent the proposed set of goals for the North Bend and Coos Bay TSP Updates were used to evaluate proposed projects and alternatives. The evaluation criteria, listed in Table 3, were outlined in Technical Memorandum \#2 and are intended to indicate how strongly each alternative supports community-expressed interests.

Table 3. Evaluation Criteria

| Proposed Goal | Criteria |
| :--- | :--- |
| Goal \#1 (Accessibility/Connectivity): Develop | - Improves or creates access to community destinations |
| an interconnected, multimodal | - Improves facilities for those using mobility devices |
| transportation network that connects all |  |
| members of the community to destinations |  |
| within and beyond the city. | - Enhances the active transportation or transit network |


| Proposed Goal | Criteria |
| :--- | :--- |
| Goal \#6 (Coordination/Collaboration): | - Is consistent with local, state, and federal plans and policies |
| Develop and maintain a Transportation | - Supports the City's land use vision |
| System Plan that is consistent with the goals | - Has regional benefits |
| and objectives of the city, Coos County, and |  |
| the state. |  |
| Goal \#7 (Strategic Investment): Provide a | - Alternative measure to increasing capacity |
| sustainable transportation system through | - Provides significant increase in mobility/accessibility |
| responsible stewardship of financial | - Project involves funding collaboration with other agencies or |
| resources. | groups |
| Goal \#8 (Health/Environment): Provide a | - Encourages active living and physical activity |
| transportation system that enhances the | - Minimizes impacts to natural resources |
| health of residents and users and that | - Reduces/discourages through travel in residential |
| minimizes impacts to the environment. | neighborhoods |

Table 4 presents an example of how a goal's evaluation criteria would be used to score a proposed project.

Table 4. Example Evaluation Criteria Scoring

## Goal: Accessibility/Connectivity

| Evaluation Criteria: <br> Criteria 1.a. | -4 | Project eliminates access to multiple community destinations for multiple modes |
| :--- | :---: | :--- |
| Improves or <br> creates access to <br> community <br> destinations | $\mathbf{- 2}$ | Project eliminates access to a community destination for at least one mode |
|  | +2 | No net impact / not applicable |
|  | +4 | Project creates access to a community destination for at least one mode to multiple community destinations for multiple modes |

In order to further differentiate projects that received the same primary evaluation score within a given mode, sets of secondary criteria were applied. These project scores were converted into High, Medium, and Low Priority groupings. Higher priority was assigned to projects that improve the existing system without adding capacity, while lower priority was assigned to projects that increased capacity without adding connectivity or improvements to active transportation, which aligns with the directive provided in the project scope.

Figure 2. Summary of Draft Alternatives


| ID | Location | Description | MODE |  |  |  |  |  | Primary Funding Source |  | Environmental Constraints | Impacts/Benefits (Qualitative) |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | ® | $\frac{\mathrm{c}}{\frac{\mathrm{c}}{\omega}}$ | $\frac{\text { ¿ }}{\stackrel{0}{\omega}}$ | $\begin{aligned} & \frac{0}{0} \\ & \stackrel{0}{0} \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { 苞 } \\ & \frac{0}{6} \end{aligned}$ | 㐫 |  |  |  | $\begin{aligned} & \text { Bike/ } \\ & \text { Ped } \end{aligned}$ | Transit | Aviation / Freight | Land Use | Mobility | Safety | Environmental /Cultural Resources | Title VI/EJ | ADA |  |
| PLANNED PROJECTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | Broadway St at Newmark Ave | STIP project planned at this location | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  | ODOT | Did not review benefits/impacts; STIP project will be complete before TSP adoption. |  |  |  |  |  |  |  |  |  |  |  |
| PLANS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | City Wide (Trails) | Develop formalized Trail Map and continue to connect sidewalk system to trails or shared-use paths | $\checkmark$ | $\checkmark$ |  |  |  |  | North Bend | N/A | TBD | + | / | N/A | N/A | + | / | / | + | N/A | Low |
| 3 | Schools | Develop a Safe Routes to School Project List (Assess all connections to school, draft plan to connect safe routes to school) | $\checkmark$ |  | $\checkmark$ |  |  |  | North Bend | N/A | TBD | + | + | N/A | N/A | + | + | / | + | + | High |
| 4 | City wide | Change "Collector" term into "Major Collector" and the "Neighborhood Route" into "Minor Collector" to align with State Classification |  |  |  | $\checkmark$ |  |  | North Bend |  |  |  |  | See Propo | d Func | nal Class | cation Pl |  |  |  |  |
| 5 | Colorado Ave: Arthur St to West End | Update functional classification from "Local" to "Major Collector" |  |  |  | $\checkmark$ |  |  | North Bend |  |  |  |  | See Propo | d Func | nal Class | cation Pl |  |  |  |  |
| 6 | Arthur St | Update functional classification from collector to "Minor Collector" |  |  |  | $\checkmark$ |  |  | North Bend |  |  |  |  | See Propo | d Func | nal Classif | cation Pl |  |  |  |  |
| 7 | City wide | Establish CIP and plan for annual/bi-annual update | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | North Bend |  |  |  |  | Will incl | e as re | mmendat | of TSP |  |  |  |  |
| 8 | City wide | Include evacuation routes in TSP (DOGAMI Beat the Wave) |  |  | $\checkmark$ |  |  |  | North Bend |  |  |  | Will incl | de as part | Emerg | cy Prepar | dness Se | tion in TSP |  |  |  |
| PEDESTRIAN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 | Sheridan Ave: Florida Ave to Bayview Ave | Add sidewalk on Sheridan Ave and upgrade RR crossing to connect Simpson Heights to downtown | $\checkmark$ |  |  |  |  |  | North Bend | \$1.4M | None | + | N/A | N/A | N/A | + | + | N/A | + | / | High |
| 10 | 16th St/17th: Broadway Ave to Oak St | Add sidewalk to provide connectivity to schools east of Broadway Ave via 16th St | $\checkmark$ |  |  |  |  |  | North Bend | \$2.1M | None | + | + | N/A | N/A | + | + | N/A | + | + | High |
| 11 | Oak St: Colorado Ave to Newmark Ave | Establish Neighborhood Greenway (traffic calming measures and wayfinding) to improve pedestrian environment | $\checkmark$ | $\checkmark$ |  |  |  |  | North Bend | TBD | None | + | 1 | N/A | N/A | + | + | N/A | + | N/A | High |
| 12 | Pacific St: Crowell Ln to 16th St | Sidewalk on west side and enhanced crossings (visibility) | $\checkmark$ |  | $\checkmark$ |  |  |  | North Bend | \$730k | None | + | + | N/A | N/A | + | + | N/A | + | / | Medium |
| 13 | Virginia Ave: US 101 to Broadway Ave | Identify opportunities for access consolidation (with redevelopment/change of use); traffic calming (landscaping, street furniture) | $\checkmark$ |  |  |  |  |  | ODOT | TBD | Tsunami Zone \& 100 yr floodplain | + | + | / | - | - | + | N/A | N/A | + | Low |
| 14 | Newmark Ave: Broadway Ave to West City Limits | Access consolidation and medians | $\checkmark$ |  | $\checkmark$ |  |  |  | ODOT | \$175k | None | + | + | / | - | - | + | N/A | N/A | + | Low |
| 15 | Newmark St: US 101 to Sherman Ave | Half street improvement Sherman Ave to US 101 to provide bicycle and pedestrian facilities | $\checkmark$ | $\checkmark$ |  | $\checkmark$ |  |  | North Bend | \$1M | None | + | + | + | / | + | + | + | + | + | Medium |
| 16 | North Bend Senior Center | Marked crossing of Colorado Avenue and sidewalks from transit stop to Activity Center | $\checkmark$ |  |  |  | $\checkmark$ |  | North Bend | \$375k | None | + | + | N/A | N/A | + | + | N/A | + | + | Medium |
| 17 | Boynton Park | Marked crossing of Sherman Avenue at Exchange Street transit stop | $\checkmark$ |  | $\checkmark$ |  | $\checkmark$ |  | North Bend | \$65k | None | + | + | N/A | N/A | + | + | + | + | + | High |
| 18 | Airport Heights Market | Improve crossing for pedestrians | $\checkmark$ |  |  |  | $\checkmark$ |  | North Bend | TBD | None | + | + | N/A | N/A | + | + | N/A | + | + | Low |

[^45]| Cities of Coos Bay and North Bend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Description | MODE |  |  |  |  |  | Primary Funding Source | Prelim. Cost Estimate (2019 \$) | Environmental Constraints | Impacts/Benefits (Qualitative) |  |  |  |  |  |  |  |  |  |
| ID | Location |  | - | $\frac{\stackrel{y}{\omega}}{\omega}$ |  |  | 葡 | $\begin{array}{\|l\|l\|} \hline \stackrel{y}{5} \\ \hline \end{array}$ |  |  |  | $\begin{gathered} \text { Bike/ } \\ \text { Ped } \end{gathered}$ | Transit | Aviation / Freight | Land Use | Mobility | Safety | Environmental /Cultural Resources | $\begin{aligned} & \text { Title } \\ & \text { vi/E } \end{aligned}$ | ADA |  |
| 19 | US 101 north of Florida Ave | Identify preferred location for pedestrian crossing of US 101. Locate near visitor center to provide connectivity to Simpson Park | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |  | ODOT | TBD | TBD | + | , | N/A | N/A | + | + | TBD | + | + | High |
| 20 | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five mile uninterrupted boardwalk. | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |  | North <br> Bend; Coos <br> Bay; <br> Private | TBD | Haz. Mat; Threatened/ Endangered; Wetland; Tsunami Zone; 100 yr floodplain | + | + | / | + | + | + | - | + | / | Low |
| 21 | Broadway Ave between Virginia and Newmark | Improve sidewalks and PLTS | $\checkmark$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 22 | Maine Ave/Broadway Ave | Rapid Flashing Beacon and pedestrian refuge island on Broadway Ave at Maine Ave for North Bend Middle School students. Sidewalk infill on $14^{\text {th }}$ St and Pacific Ave to create a complete route for students walking or biking to school. | $\checkmark$ | $\checkmark$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BICYCLE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 | City Wide | Create a Bicycle Transportation Plan that connects Arterials, Collectors (neighborhood calming, parallel routes, signing, formal striping) |  | $\checkmark$ |  |  |  |  | North Bend | TBD | TBD | + | + | N/A | N/A | + | + | / | + | N/A | High |
| 24 | Virginia Ave and Broadway Ave (Cape Arago Hwy) | Provide bicycle facilities through coordination with the OCBR (Priority Virginia Ave to 16th St) |  | $\checkmark$ |  |  |  |  | ODOT | TBD | None | + | N/A | TBD | N/A | + | + | N/A | + | N/A | Medium |
| 25 | Maple Leaf/Colorado | Stripe bicycle facilities (with repaving project) |  | $\checkmark$ |  | $\checkmark$ |  |  | North Bend | \$1.6M | None | + | + | N/A | N/A | + | + | / | + | N/A | High |
| 26 | Sheridan Ave: Florida Ave to Bayview Ave | Provide bicycle facilities through signing/striping |  | $\checkmark$ |  |  |  |  | North Bend | See Project 9 | None | + | + | N/A | N/A | + | + | / | + | N/A | Medium |
| 27 | City Wide | Establish Neighborhood Greenway (traffic calming measures and wayfinding): Harrison, Pony Creek, Crowell, 16th, Myrtle, 17th, Oak, Lakeshore, Virginia Ave |  | $\checkmark$ |  |  |  |  | North Bend | TBD | TBD | + | + | N/A | N/A | + | + | / | + | N/A | Medium |
| 28 | Newmark Ave: Broadway Ave to West City Limits | Provide bicycle facilities (OCBR) through lane diet or parallel routes/wayfinding. Parallel route options: Oak St, $16^{\text {th }} / 17^{\text {th }}$, Myrtle St, Commercial St. Consider narrowing travel lanes and widening sidewalks where parallel route is challenging. |  | $\checkmark$ |  |  |  |  | ODOT | \$32,000 | None | + | + | - | TBD | + | + | TBD | + | N/A | Low |
| 29 | Newmark St: Sherman Ave to Broadway Ave | Provide bicycle facilities restriping (with repaving project) |  | $\checkmark$ |  |  |  |  | North Bend | \$6.1M | Tsunami zone \& 100 yr floodplain | + | + | - | TBD | + | + | TBD | + | N/A | Low |
| 30 | US 101 | Provide bicycle facilities (OCBR priority) through parallel routes |  | $\checkmark$ | $\checkmark$ |  |  |  | ODOT | TBD | TBD | + | + | N/A | N/A | + | + | / | + | N/A | Medium |
| TRANSIT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 31 | Bay Area Loop | Add weekend service |  |  |  |  | $\checkmark$ |  | CCAT | N/A | None | + | + | N/A | TBD | + | N/A | N/A | + | + | High |
| 32 | All Transit Routes | Extend service hours |  |  |  |  | $\checkmark$ |  | CCAT | N/A | None | + | + | N/A | N/A | + | N/A | N/A | + | + | High |
| 33 | US 101 \& Sherman Ave | Increase frequency \& add additional route |  |  |  |  | $\checkmark$ |  | CCAT | N/A | TBD | + | + | N/A | TBD | + | N/A | N/A | + | + | High |
| 34 | All Transit Routes | Add shelters and stops near community destinations | $\checkmark$ | $\checkmark$ |  |  | $\checkmark$ |  | CCAT | N/A | TBD | + | + | TBD | TBD | + | N/A | TBD | + | + | Medium |
| 35 | All Transit Routes | Improve bicycle and ped connectivity to stops | $\checkmark$ | $\checkmark$ |  |  | $\checkmark$ |  | North Bend |  |  |  |  | Project | identif | in Bike/P | d plans |  |  |  |  |


| Cities of Coos Bay and North Bend Transportation System Plan Updates |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2019 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Description | MODE |  |  |  |  |  | Primary Funding Source | Prelim. Cost Estimate (2019 \$) | Environmental Constraints | Impacts/Benefits (Qualitative) |  |  |  |  |  |  |  |  |  |
| ID | Location |  | ® | $\frac{\stackrel{y y}{\omega}}{\underline{\omega}}$ | 芯范 | $\begin{aligned} & \frac{0}{\mathrm{og}} \\ & \frac{5}{5} \end{aligned}$ |  | $\begin{aligned} & \dot{\ddot{y}} \stackrel{0}{\circ} \end{aligned}$ |  |  |  | $\begin{aligned} & \begin{array}{l} \text { Bike/ } \\ \text { Ped } \end{array} \end{aligned}$ | Transit | Aviation / Freight | Land Use | Mobility | Safety | Environmental /Cultural Resources | Title VI/EJ | ADA |  |
| SAFETY CONCERN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 36 | Virginia Ave at Meade Ave | Traffic calming along Meade and Connecticut: Narrow up street feeling (bulb outs, speed humps, formalize on street parking) -- Mimic aspects of Downtown Streetscape. | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  | North Bend (Urban Renewal) | TBD | None | + | / | N/A | TBD | + | + | N/A | + | + | Medium |
| 37 | Newmark Ave at Oak St | Enhance visibility of signal and pavement paint/crossings -recent improvements may improve conditions. |  |  | $\checkmark$ | $\checkmark$ |  |  | ODOT | No alternative identified; continue to monitor intersection recent changes were made to improve safety |  |  |  |  |  |  |  |  |  |  |  |
| 38 | US 101 at Florida Ave | Monitor crash history in future -- recent improvements may improve conditions. |  |  | $\checkmark$ |  |  |  | North Bend | No alternative identified; continue to monitor intersection recent changes were made to improve safety |  |  |  |  |  |  |  |  |  |  |  |
| 39 | US 101 South at Virginia Ave | Monitor crash history in future -- recent improvements may improve conditions. |  |  | $\checkmark$ |  |  |  | North Bend | No alternative identified; continue to monitor intersection recent changes were made to improve safety |  |  |  |  |  |  |  |  |  |  |  |
| 40 | Washington Ave at US 101 South/Sherman Ave | Explore options to provide safer pedestrian crossing of highway (curb bulb outs, RRFB, median refuge, lighting, signage). Pedestrian signage is most viable option. | $\checkmark$ |  | $\checkmark$ |  |  |  | ODOT | $\begin{aligned} & \$ 5 \mathrm{k}- \\ & \$ 30 \mathrm{k} \end{aligned}$ | None | + | + | TBD | TBD | + | + | N/A | + | + | Medium |
| 41 | Pony Creek Rd at Crowell Ln | Tighten radius of western curbs, pavement markings, formalize striping on Pony Creek Rd and consider all-way stop control | $\checkmark$ |  | $\checkmark$ | $\checkmark$ |  |  | North Bend | \$50k | Tsunami Zone \& 100 yr floodplain | + | N/A | N/A | TBD | + | + | N/A | + | + | High |
| 42 | US 101 at Newmark St | Monitor crash history in future -- recent timing improvements may improve conditions. |  |  | $\checkmark$ |  |  |  | ODOT | No alternative identified; continue to monitor intersection recent changes were made to improve safety |  |  |  |  |  |  |  |  |  |  |  |
| 43 | US 101 near California Ave | Monitor crash history in future -- recent improvements may improve conditions. |  |  | $\checkmark$ |  |  |  | ODOT | No alternative identified; continue to monitor intersection recent changes were made to improve safety |  |  |  |  |  |  |  |  |  |  |  |
| 44 | OR 540 near State St | Explore enhanced striping/channelization/overhead signage to improve sight distance and driver expectancy. |  |  | $\checkmark$ |  |  |  | ODOT | TBD | None | / | / | / | N/A | / | + | N/A | N/A | / | Low |
| 45 | Newmark St near Brussels St | Improve visibility by repave and restripe |  |  | $\checkmark$ | $\checkmark$ |  |  | North Bend | \$850k | None | / | / | + | N/A | + | + | N/A | N/A | / | High |
| 46 | Newmark St at Sherman Ave | Improve visibility by repave and restripe |  |  | $\checkmark$ | $\checkmark$ |  |  | North Bend | \$850k | None | / | / | + | N/A | + | + | N/A | N/A | 1 | Medium |
| ROADWAY |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 47 | Between Broadway Ave and Sherman Ave | Identify future connections in functional classification plan of Clark St, State St, Wall St, Lombard St for local street connectivity | $\checkmark$ | $\checkmark$ |  | $\checkmark$ |  |  | North Bend | Did not review benefits/impacts; Pony Creek Estuary Plan preserves space. |  |  |  |  |  |  |  |  |  |  |  |
| 48 | City wide | Fix Potholes. Maintain/fix/strengthen existing pavement system, account for maintenance in funding plan. Critical: Arterials and collectors with fair or worse pavement conditions, such as $16^{\text {th }} \mathrm{St}, 17^{\text {th }} \mathrm{St}$, Arthur St, Brussels St, Colorado Ave, Crowell Ln, Harrison Ave, Pacific St, Pony Creek St. | $\checkmark$ | $\checkmark$ |  | $\checkmark$ |  |  | North Bend | $\begin{aligned} & \$ 16.5 \mathrm{M} \\ & (2014 \text { \$) } \end{aligned}$ | TBD | + | + | + | N/A | + | + | N/A | N/A | N/A | High |
| RAIL/TRUCK FREIGHT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 49 | Coos Bay Rail Line | Make improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels as identified in the OFP to create or improve multimodal business opportunities |  |  |  |  |  | $\checkmark$ | ODOT <br> (OFP); Coos <br> Bay Rail | Did not review benefits/impacts; City not a decision-maker |  |  |  |  |  |  |  |  |  |  |  |
| 50 | US 101 at Lewis Street/Mill Casino | Address Highway Over-Dimension Load Pinch Point by raising signal head |  |  |  | $\checkmark$ |  | $\checkmark$ | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | \$250k | None | N/A | N/A | + | N/A | + | / | N/A | N/A | N/A | Low |
| 51 | California Ave between Sherman Ave, US 101 and | Address poor pavement condition (2015) data, widen roadway, improve safety at rail crossing, improve turning movements for one-way portion per OFP |  |  |  | $\checkmark$ |  | $\checkmark$ | ODOT (OFP); | \$2M | TBD | N/A | + | + | TBD | + | / | TBD | N/A | N/A | Medium |

[^46]|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ID | Location | Description | MODE |  |  |  |  |  | Primary Funding Source | Prelim. Cost Estimate (2019 \$) | Environmental Constraints | Impacts/Benefits (Qualitative) |  |  |  |  |  |  |  |  | Prelim. Evaluation Rating/ Need |
|  |  |  | \% | $\frac{\stackrel{c}{\omega}}{\stackrel{y}{\omega}}$ |  | $\begin{aligned} & \frac{0}{0} \\ & \stackrel{0}{5} \\ & \stackrel{y}{5} \end{aligned}$ | $\begin{aligned} & \text { 些 } \\ & \text { en } \end{aligned}$ | 单 |  |  |  | $\begin{aligned} & \text { Bike/ } \\ & \text { Ped } \end{aligned}$ | Transit | Aviation / Freight | $\begin{aligned} & \text { Land } \\ & \text { Use } \end{aligned}$ | Mobility | Safety | Environmental <br> /Cultural <br> Resources | Title VI/E | ADA |  |
|  | the Dock Facility/North Bend Boardwalk |  |  |  |  |  |  |  | North Bend (pavement) |  |  |  |  |  |  |  |  |  |  |  |  |
| 52 | US 101 at Florida Ave | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  |  | $\checkmark$ |  | $\checkmark$ | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | Did not review benefits/impacts; information provided by ODOT suggested this is no longer a defic |  |  |  |  |  |  |  |  |  |  |  |
| MARINE/AIRPORT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 53 | City Dock: Virginia Ave/Harbor Ave | Construct a new city dock at the eastern terminus of Virginia Ave (per Downtown Waterfront District Master Plan) |  |  |  |  |  | $\checkmark$ | North Bend; | TBD | Threatened/ Endangered; Wetland; Tsunami Zone; 100 yr floodplain | N/A | N/A | + | + | + | N/A | - | / | / | Low |
| 54 | Charleston boatyard | Improvements that include the Marine Ways |  |  |  |  |  | $\checkmark$ | Port of Coos Bay | Did not review benefits/impacts; not a City-led effort. |  |  |  |  |  |  |  |  |  |  |  |
| 55 | Oregon Gateway | North Spit improvements to accommodate a multi-modal marine facility to handle bulk cargo, containers and an LNG export facility |  |  |  |  |  | $\checkmark$ | Port of Coos Bay | Did not review benefits/impacts; not a City-led effort. |  |  |  |  |  |  |  |  |  |  |  |
| 56 | Coos Bay | Federal channel widening and deepening to accommodate larger ships and ensure safer operations |  |  |  |  |  | $\checkmark$ | Port of Coos Bay | Did not review benefits/impacts; not a City-led effort. |  |  |  |  |  |  |  |  |  |  |  |
| 57 | Charleston boatyard | Dock replacements |  |  |  |  |  | $\checkmark$ | Port of Coos Bay | Did not review benefits/impacts; not a City-led effort. |  |  |  |  |  |  |  |  |  |  |  |
| 58 | Airport | Add direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland) |  |  |  |  |  | $\checkmark$ | Coos County Airport District | Did not review benefits/impacts; not a City-led effort. |  |  |  |  |  |  |  |  |  |  |  |
| 59 | Airport | Provide transit service to airport if air passenger service increases |  |  |  |  | $\checkmark$ | $\checkmark$ | CCAT | Did not review benefits/impacts; not a City-led effort. |  |  |  |  |  |  |  |  |  |  |  |

## 1. $\checkmark$ Bold Check Mark indicates which mode benefits most from project

2. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs. ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District Impacts/Benefits: (+) Positive; (-) Negative; (/) Neutral; (N/A) Not applicable; (TBD) To Be Determined

|  |  | Description | MODE |  |  |  |  |  | Primary Funding Source | Prelim. Cost Estimate (\$-\$\$\$) | Environmental Constraints | Impacts/Benefits (Qualitative) |  |  |  |  |  |  |  |  | Prelim.Evaluation Rating/ Need |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ID | Location |  | \% | $\frac{\stackrel{y}{\omega}}{\stackrel{y}{\omega}}$ | $\begin{aligned} & \text { zin } \\ & \text { in } \\ & \hline \end{aligned}$ | $\begin{aligned} & \frac{0}{0} \\ & \hline \end{aligned}$ |  | 흫 |  |  |  | $\begin{aligned} & \text { Bike/ } \\ & \text { Ped } \end{aligned}$ | Transit | Aviation / Freight | $\begin{aligned} & \text { Land } \\ & \text { Use } \end{aligned}$ | Mobility | Safety | Environmental /Cultural Resources | Title VI/EJ | ADA |  |
|  |  | PLANNED PROJECTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | D St/Coos River Hwy: $6^{\text {th }}$ Ave to Ross Inlet Rd | Add sidewalks to both sides of roadway (safe routes to school) | $\checkmark$ |  | $\checkmark$ |  |  |  | Safe Routes to School | Did not review benefits/impacts; SRTS project will be complete before TSP adoption. |  |  |  |  |  |  |  |  |  |  |  |
| 2 | Johnson Ave at US 101 North | STIP project planned to adjust timing |  |  | $\checkmark$ | $\checkmark$ |  |  | ODOT | Did not review benefits/impacts; STIP project will be complete before TSP adoption. |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Newport Ln: Flanagan Rd to Mullen Rd | STIP project planned to provide sidewalk from Flanagan Rd to Mullen Rd and provides static pedestrian crossings | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |  | ODOT | Did not review benefits/impacts; STIP project will be complete near TSP adoption. |  |  |  |  |  |  |  |  |  |  |  |
| PLANS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | City Wide (Trails) | Develop formalized Trail Map and continue to connect sidewalk system to trails or shared-use paths | $\checkmark$ | $\checkmark$ |  |  |  |  | Coos Bay | TBD | TBD | + | / | N/A | N/A | + | / | / | + | N/A | Low |
| 5 | Schools | Develop a Safe Routes to School Project List (Assess all connections to school, draft plan to connect safe routes to school) | $\checkmark$ |  | $\checkmark$ |  |  |  | Coos Bay | TBD | TBD | + | + | N/A | N/A | + | + | / | + | + | High |
| 6 | City wide | Change "collector" term into "major collector" and the neighborhood routes into "minor collectors" to align with State Classification |  |  |  | $\checkmark$ |  |  | Coos Bay | See Proposed Functional Classification Plan |  |  |  |  |  |  |  |  |  |  |  |
| 7 | Koosbay Blvd: 10th St to US 101 | Update functional classifications - Classification between 10th Street and US 101 (arterial) differs from the State's classification as an urban collector. |  |  |  | $\checkmark$ |  |  | Coos Bay | See Proposed Functional Classification Plan |  |  |  |  |  |  |  |  |  |  |  |
| 8 | City wide | Include evacuation routes in TSP (DOGAMI Beat the Wave) |  |  | $\checkmark$ |  |  | $\checkmark$ | Coos Bay | Will include as part of Emergency Preparedness Section in TSP |  |  |  |  |  |  |  |  |  |  |  |
| 9 | Front St | Traffic Safety Plan in support of future development of Front St |  |  | $\checkmark$ | $\checkmark$ |  |  | Coos Bay | TBD | TBD | + | + | + | + | + | + | / | + | + | High |
| PEDESTRIAN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | Morrison St: Newmark Ave to Pacific Ave | Upgrade sidewalks on both sides | $\checkmark$ |  | $\checkmark$ |  |  |  | Coos Bay | \$2.5M | None | + | N/A | N/A | / | + | + | N/A | + | + | Medium |
| 11 | Sherman Ave/Koos Bay Blvd: North City Limits to US 101 | Infill sidewalk to provide pedestrian access on at least one side of street. Establish Neighborhood Greenway (traffic calming measures and wayfinding) on parallel route (see project CB 31) | $\checkmark$ | $\checkmark$ |  |  |  |  | Coos Bay | TBD | Historic Landslide \& 100 yr floodplain (east end) | + | + | N/A | N/A | + | + | N/A | + | / | Medium |
| 12 | Mingus Park | Wayfinding signs to park | $\checkmark$ | $\checkmark$ |  |  |  |  | Coos Bay | $\begin{gathered} \$ 20 \mathrm{k}- \\ 50 \mathrm{k} \end{gathered}$ | None | + | / | N/A | N/A | + | / | N/A | + | N/A | High |
| 13 | Newmark Ave: Empire Blvd to Fir St | Improve PLTS score through access consolidation, median islands, mid-block ped crossing | $\checkmark$ |  |  |  |  |  | Coos Bay | TBD | None | + | / | N/A | / | + | + | N/A | + | + | Medium |
| 14 | Woodland Dr: North City Limits to Ocean Blvd | Add sidewalks on Woodland Dr, marked ped crossing (access to Hospital/Medical Park) | $\checkmark$ |  | $\checkmark$ |  | $\checkmark$ |  | Coos Bay | \$3.2M | None | + | + | N/A | N/A | + | + | N/A | + | + | High |
| 15 | Thompson Road near Bay Area Hospital | Add marked crossing and mid-block crossing of Thompson Road to access hospital transit stop | $\checkmark$ |  |  |  | $\checkmark$ |  | Coos Bay | \$50k | None | + | + | N/A | N/A | + | + | N/A | + | + | High |
| 16 | Hospital Way near Medical Center (Immediate Care Clinic) | Add sidewalk to connect to medical facilities | $\checkmark$ |  |  |  | $\checkmark$ |  | Coos Bay | \$560k | None | + | + | N/A | N/A | + | + | N/A | + | + | High |
| 17 | Ocean Blvd at Wallace St (Three Rivers Casino) | Construct sidewalk along Wallace St and add RRFB crossing of Ocean Blvd at Wallace St to connect to transit | $\checkmark$ |  |  |  | $\checkmark$ |  | Coos Bay | \$400k | None | + | + | N/A | N/A | + | + | + | + | + | Low |

Draft System Alternatives

| Cities of Coos Bay and North Bend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Mо | DE |  |  |  | Prelim. |  |  |  |  | Impa | s/Benefits | Qualita |  |  |  | 2019 |
| ID | Location | Description | ® | $\stackrel{\stackrel{y}{\omega}}{\bar{\omega}}$ | $\stackrel{\text { Bu }}{0}$ |  |  | $\begin{aligned} & \text { 帝 } \\ & \hline \end{aligned}$ | Primary Funding Source | $\begin{gathered} \text { Cost } \\ \text { Estimate } \\ (\$-\$ \$ \$ \$) \end{gathered}$ | Environmental Constraints | $\begin{aligned} & \text { Bike/ } \\ & \text { Ped } \end{aligned}$ | Transit | Aviation / Freight | Land Use | Mobility | Safety | Environmental /Cultural Resources | Title VI/EJ | ADA | Evaluatio n Rating/ Need |
| 18 | Coos Bay Boardwalk (near Anderson Ave and Market Ave) | Construct at-grade multimodal improvements (pavement) | $\checkmark$ |  | $\checkmark$ | $\checkmark$ |  | $\checkmark$ | Coos Bay; Coos Bay Rail | \$500k | $\begin{gathered} 100 \mathrm{yr} \\ \text { floodplain } \end{gathered}$ | + | N/A | + | N/A | + | + | N/A | + | + | High |
| 19 | US 101: Commercial Ave and Alder Ave | Improved bike/pedestrian crossings across US 101 to be consistent with Front Street Action Plan | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |  | ODOT | \$100k | $100 \mathrm{yr}$ floodplain | + | + | / | N/A | + | + | N/A | + | + | High |
| 20 | Ocean Blvd at LcClair St | Construct a pedestrian crossing with RRFB and median refuge | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |  | Coos Bay | \$200k | None | + | / | / | N/A | + | + | N/A | + | + | Medium |
| 21 | Front St near Coos History Museum and Maritime Collection | North-south pedestrian pathway along the eastern side of Front St | $\checkmark$ | $\checkmark$ |  |  |  | $\checkmark$ | City/Private | Did not review benefits/impacts; recommend implement Project C1 in 2017 Front Street Action Plan (adopted) |  |  |  |  |  |  |  |  |  |  |  |
| 22 | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five mile uninterrupted boardwalk. | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |  | North <br> Bend; Coos <br> Bay; <br> Private | TBD | Haz. Mat; <br> Threatened/ <br> Endangered; <br> Wetland; <br> Tsunami <br> Zone; 100 yr <br> floodplain | + | + | / | + | + | + | - | + | / | Low |
| BICYCLE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 | City Wide | City create a Bicycle Transportation Plan that connects Arterials, Collectors (neighborhood calming, parallel routes, signing, formal striping) |  | $\checkmark$ |  |  |  |  | Coos Bay | TBD | TBD | + | + | N/A | N/A | + | + | / | + | N/A | High |
| 24 | Ocean Blvd | Extend road diet west from Woodland Dr to Newmark Blvd and provide mid-block ped crossing at Wallace St and LaClair St | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  | Coos Bay | $\begin{gathered} \$ 115 \mathrm{k}- \\ 300 \mathrm{k} \end{gathered}$ | None | + | + | N/A | N/A | + | + | N/A | + | + | Medium |
| 25 | Newmark Ave: Ackerman Ave to Cammann St | Restripe road to provide bicycle facilities (road diet) |  | $\checkmark$ |  |  |  |  | Coos Bay | \$25k | None | + | + | N/A | N/A | + | + | N/A | + | N/A | Medium |
| 26 | Woodland Dr: North City Limits to Ocean Blvd | Add bicycle facilities (add sharrows if ROW acquisition not feasible) |  | $\checkmark$ |  |  |  |  | Coos Bay | \$40k | None | + | + | N/A | N/A | + | + | N/A | + | N/A | High |
| 27 | Newport Ln | Improve bicycle LTS through enhanced signage \& wayfinding to connect Coos Bay UGB |  | $\checkmark$ | $\checkmark$ |  |  |  | Coos County | TBD | None | + | N/A | N/A | N/A | + | + | N/A | + | + | Medium |
| 28 | D St/Coos River Rd: 6th Ave to East City Limits | Widen paved shoulder and provide enhanced signage \& wayfinding |  | $\checkmark$ | $\checkmark$ |  |  |  | Coos Bay | \$690k | Near emergent wetland \& 100 yr floodplain (east end) | + | / | N/A | N/A | + | + | N/A | + | N/A | Low |
| 29 | US 101: South couplet to Coalbank Slough Bridge | Restripe to accommodate bicycle lane (options for additional signing/striping/ramp at bridge) |  | $\checkmark$ | $\checkmark$ |  |  |  | ODOT | $\begin{gathered} \$ 20 \mathrm{k} \\ 75 \mathrm{k} \end{gathered}$ | 100 yr floodplain | + | N/A | N/A | N/A | + | + | N/A | + | N/A | Medium |
| 30 | US 101 | Provide bicycle lanes (OCBR priority) through road widening or lane diet. |  | $\checkmark$ | $\checkmark$ |  |  |  | ODOT | TBD | Varies | + | + | - | TBD | + | + | TBD | + | N/A | Medium |
| 31 | N $14^{\text {th }}$ St: Teakwood Ave to Juniper Ave | Provide a parallel bicycle route to Koos Bay Blvd by providing sharrows and wayfinding on $\mathrm{N} 14^{\text {th }} \mathrm{St}$ |  | $\checkmark$ |  |  |  |  | Coos Bay | TBD | TBD | + | + | N/A | N/A | + | + | 1 | + | N/A | Medium |
| TRANSIT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 32 | Bay Area Loop | Add weekend service |  |  |  |  | $\checkmark$ |  | CCAT | N/A | None | + | + | N/A | TBD | + | N/A | N/A | + | + | High |
| 33 | All Transit Routes | Extend service hours |  |  |  |  | $\checkmark$ |  | CCAT | N/A | None | + | + | N/A | N/A | + | N/A | N/A | + | + | High |
| 34 | US 101 \& Ocean Blvd Routes | Increase frequency \& add additional route |  |  |  |  | $\checkmark$ |  | CCAT | N/A | TBD | + | + | N/A | TBD | + | N/A | N/A | + | + | High |

[^47]| Cities of Coos Bay and North Bend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | MODE |  |  |  |  |  | Primary Funding Source | Prelim. Cost Estimate (\$-\$\$\$\$) | Environmental Constraints | Impacts/Benefits (Qualitative) |  |  |  |  |  |  |  |  |  |
| ID | Location | Description | \% | $\stackrel{\stackrel{y}{\bar{\omega}}}{\underline{\omega}}$ | $\stackrel{?}{\mathbf{0}}$ | $\begin{array}{\|l\|l\|} \hline \frac{0}{0} \\ \stackrel{y y y y}{5} \\ \hline \end{array}$ | 䔍 |  |  |  |  | $\begin{aligned} & \text { Bike/ } \\ & \text { Ped } \end{aligned}$ | Transit | Aviation <br> / Freight | $\begin{aligned} & \text { Land } \\ & \text { Use } \end{aligned}$ | Mobility | Safety | Environmental /Cultural Resources | Title VI/EJ | ADA |  |
| 35 | All Transit Routes | Add shelters and stops near community destinations |  |  |  |  | $\checkmark$ |  | CCAT | N/A | TBD | + | + | TBD | TBD | + | N/A | TBD | + | + | High |
| 36 | All Transit Routes | Improve bicycle and ped connectivity to stops | $\checkmark$ | $\checkmark$ |  |  | $\checkmark$ |  | Coos Bay | Projects identified in Bike/Ped plans |  |  |  |  |  |  |  |  |  |  |  |
| 37 | Bay Area | Support CCAT in their pursuit of regional transit hub |  |  |  |  | $\checkmark$ |  | CCAT | N/A | TBD | + | + | N/A | TBD | + | N/A | N/A | + | + | Medium |
| 38 | Coos Bay | Work with CCAT to identify locations for transit pull outs on busier streets |  |  |  |  | $\checkmark$ |  | CCAT | N/A | TBD | + | + | N/A | - | + | + | TBD | + | + | Low |
| SAFETY CONCERN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 39 | Ocean Blvd at 19 ${ }^{\text {th }}$ St | Enhanced channelization of side street to improve safety |  |  | $\checkmark$ | $\checkmark$ |  |  | Coos Bay | TBD | None | 1 | N/A | N/A | N/A | + | + | N/A | N/A | N/A | Low |
| 40 | Thompson Ave at Woodland Dr | Restripe the east leg to remove the westbound right-turn bay and make the movement a shared thru/right to improve sight distance. |  |  | $\checkmark$ | $\checkmark$ |  |  | Coos Bay | \$300k | None | + | + | N/A | N/A | N/A | + | N/A | N/A | N/A | Medium |
| 41 | Koosbay Blvd at 10th St | Realign intersection to "T" to improve visibility and safety |  |  | $\checkmark$ |  |  |  | Coos Bay | TBD | None | + | + | N/A | N/A | 1 | + | N/A | N/A | + | Medium |
| 42 | US 101: near Kruse Ave | Access management/channelization |  |  | $\checkmark$ |  |  |  | ODOT | \$100k | $\begin{aligned} & 100 \mathrm{yr} \\ & \text { floodplain } \end{aligned}$ | TBD | N/A | N/A | N/A | - | + | N/A | N/A | N/A | Low |
| 43 | S 10 ${ }^{\text {th }}$ St: near Central Ave | Curb bump outs (consistent through downtown) |  |  | $\checkmark$ |  |  |  | Coos Bay | \$40k | None | + | N/A | N/A | N/A | / | + | N/A | N/A | + | Low |
| 44 | Ingersoll St: near S 2nd St | Curb bump outs (consistent through downtown) |  |  | $\checkmark$ |  |  |  | Coos Bay | \$40k | $\begin{aligned} & 100 \mathrm{yr} \\ & \text { floodplain } \end{aligned}$ | + | N/A | N/A | N/A | 1 | + | N/A | N/A | + | Medium |
| 45 | 7th St at Ingersoll Ave | Curb bump outs | $\checkmark$ |  | $\checkmark$ |  |  |  | Coos Bay | \$40k | None | + | N/A | N/A | N/A | / | + | N/A | N/A | + | Medium |
| ROADWAY |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 46 | Schoneman Ave: Lakeshore Dr to Newmark Ave | Upgrade to collector standard (storm/curb/gutter/sidewalk) and connect to trail system in John Topits Park | $\checkmark$ | $\checkmark$ |  | $\checkmark$ |  |  | Coos Bay | \$1.4M | Near Riverine \& Wetland | + | N/A | N/A | 1 | + | + | - | + | + | Medium |
| 47 | Newmark Ave at Ocean Blvd | Realign Ocean Blvd at Newmark Ave to " T ", shorten ped crossing, improve connectivity to Transit | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  | Coos Bay | TBD | None | + | + | N/A | N/A | + | + | N/A | + | + | High |
| 48 | Newmark Ave at Morrison St | Operations expected to exceed City mobility target (LOS F) but low volumes do not warrant traffic control. Monitor. |  |  |  | $\checkmark$ |  |  | Coos Bay | No alternative identified; continue to monitor intersection as volumes do not warrant traffic control |  |  |  |  |  |  |  |  |  |  |  |
| 49 | $7^{\text {th }}$ St at Anderson Ave | Channelization/access management of local streets |  |  |  | $\checkmark$ |  |  | Coos Bay | TBD | None | + | N/A | N/A | - | - | + | N/A | N/A | N/A | Low |
| 50 | Hall Ave at US 101 N | Monitor traffic congestion |  |  |  | $\checkmark$ |  |  | ODOT | No alternative identified; continue to monitor intersection as expected to meet ODOT mobility targets |  |  |  |  |  |  |  |  |  |  |  |
| 51 | US 101 South: Johnson Ave to Kruse Ave | Provide landscaping or pedestrian buffer to reduce large, underutilized pavement area on east side of US 101 South. |  |  | $\checkmark$ | $\checkmark$ |  | $\checkmark$ | ODOT; City | \$25k | $\begin{aligned} & 100 \mathrm{yr} \\ & \text { floodplain } \end{aligned}$ | + | N/A | / | + | / | + | N/A | N/A | N/A | Low |
| 52 | US 101 South: Kruse Ave to S Front St | Upgrade S Front St to its arterial standard cross-section and limit access to right-in/right out at Kruse Ave/S $1^{\text {st }}$ St | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  | City | \$1-2M | $100 \mathrm{yr}$ floodplain | + | N/A | N/A | / | + | + | N/A | + | + | Low |
| 53 | City wide | Fix Potholes. Maintain/fix/strengthen existing pavement system, account for maintenance in funding plan. Critical: Central Ave, Southwest Blvd, Koosbay Blvd, Blanco Ave, Radar Rd, Schoneman St, LaClair St, F St, Butler Rd, Juniper Ave and Fulton Ave |  |  |  | $\checkmark$ |  |  | Coos Bay | $\begin{gathered} \$ 66 \mathrm{M} \\ (2015 \$) \end{gathered}$ | TBD | + | + | + | N/A | + | + | N/A | N/A | N/A | High |
| 54 | Newport Ln/Isthmus Slough Bridge | Widen structure to accommodate bicycle and pedestrians. Consider interim option to provide "bicycle warning beacons" on either side of bridge to indicate when bicyclists are present. | $\checkmark$ | $\checkmark$ |  | $\checkmark$ |  |  | County; ODOT |  |  | Did n | t review b | enefits/imp | cts; | City-led e | ort and | lustrative project. |  |  |  |
| RAIL/TRUCK FREIGHT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 55 | Coos Bay Rail Line | Make improvements to bridges, spurs, tracks, transload sidings, at grade crossings and tunnels as identified in the OFP to create or improve multimodal business opportunities |  |  |  |  |  | $\checkmark$ | ODOT <br> (OFP); Coos <br> Bay Rail | Did not review benefits/impacts; City not a decision-maker |  |  |  |  |  |  |  |  |  |  |  |

[^48]| Cities of Coos Bay and North Bend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ID | Location | Description | MODE |  |  |  |  |  | Primary Funding Source | Prelim． Cost Estimate （\＄－\＄\＄\＄\＄） | Environmental Constraints | Impacts／Benefits（Qualitative） |  |  |  |  |  |  |  |  | Prelim． Evaluatio n Rating／ Need |
|  |  |  | ® | 踣 | $\stackrel{7}{0}$ | $\begin{array}{\|l\|l} \frac{0}{5} \\ \stackrel{y}{5} \\ \hline \end{array}$ | $\begin{aligned} & \text { 葡 } \\ & \text { 范 } \end{aligned}$ | 新 |  |  |  | $\begin{aligned} & \text { Bike/ } \\ & \text { Ped } \end{aligned}$ | Transit | Aviation ／Freight | $\begin{aligned} & \text { Land } \\ & \text { Use } \end{aligned}$ | Mobility | Safety | Environmental ／Cultural Resources | Title <br> VI／EJ | ADA |  |
| 56 | Market Ave at Front St | Install at－grade rail active warning device |  |  | $\checkmark$ |  |  | $\checkmark$ | Coos Bay <br> Rail | See Project 18 | None | ＋ | N／A | ＋ | N／A | ／ | ＋ | N／A | N／A | N／A | High |
| 57 | US 101 at US plywood－ Central Dock Rd | Install at－grade rail active warning device |  |  | $\checkmark$ |  |  | $\checkmark$ | Coos Bay Rail | \＄500k | $\begin{aligned} & 100 \mathrm{yr} \\ & \text { Floodplain } \end{aligned}$ | ＋ | N／A | ＋ | N／A | ／ | ＋ | N／A | N／A | N／A | High |
| 58 | US 101 at Curtis Ave | Address Highway Over－Dimension Load Pinch Point by raising signal head |  |  |  | $\checkmark$ |  | $\checkmark$ | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | $\begin{aligned} & \$ 50 \mathrm{k}- \\ & 100 \mathrm{k} \end{aligned}$ | None | N／A | N／A | ＋ | N／A | ＋ | ／ | N／A | N／A | N／A | Low |
| 59 | US 101 at Koosbay Blvd | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  |  | $\checkmark$ |  | $\checkmark$ | ODOT <br> （OFP） | TBD | 100 yr Floodplain | N／A | ＋ | ＋ | TBD | ＋ | ／ | TBD | N／A | N／A | Low |
| 60 | US 101 South at Commercial Ave | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  |  | $\checkmark$ |  | $\checkmark$ | ODOT （OFP） | TBD | $\begin{aligned} & 100 \mathrm{yr} \\ & \text { Floodplain } \end{aligned}$ | N／A | ＋ | ＋ | TBD | ＋ | ／ | TBD | N／A | N／A | Low |
| 61 | US 101 North at Johnson Ave | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  |  | $\checkmark$ |  | $\checkmark$ | ODOT <br> （OFP） | TBD | $\begin{gathered} 100 \mathrm{yr} \\ \text { Floodplain } \end{gathered}$ | N／A | ＋ | ＋ | TBD | ＋ | ／ | TBD | N／A | N／A | Low |
|  |  | MARINE／AIRPORT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 62 | Charleston boatyard | Improvements that include the Marine Ways |  |  |  |  |  | $\checkmark$ | РОСВ |  |  |  |  | ot review b | nefits／ | pacts；not | City－led | effort． |  |  |  |
| 63 | Oregon Gateway | North Spit improvements to accommodate a multi－modal marine facility to handle bulk cargo，containers and an LNG export facility |  |  |  |  |  | $\checkmark$ | РОСВ |  |  |  |  | ot review b | nefits／ | pacts；not | City－led | effort． |  |  |  |
| 64 | Coos Bay | Federal channel widening and deepening to accommodate larger ships and ensure safer operations |  |  |  |  |  | $\checkmark$ | РОСВ |  |  |  |  | ot review b | nefits／ | pacts；not | City－lec | effort． |  |  |  |
| 65 | Charleston boatyard | Dock replacements |  |  |  |  |  | $\checkmark$ | РОСВ |  |  |  |  | ot review b | nefits／ | pacts；not | City－led | effort． |  |  |  |
| 66 | Airport | Add direct commercial passenger service between Southwest Regional Airport and northwest hubs（Portland） |  |  |  |  |  | $\checkmark$ | CCAD |  |  |  |  | ot review | nefits／ | pacts；not | City－led | effort． |  |  |  |
| 67 | Airport | Provide transit service to airport if air passenger service increases |  |  |  |  | $\checkmark$ | $\checkmark$ | CCAT |  |  |  |  | ot review b | nefits／ | pacts；not | City－led | effort． |  |  |  |

Notes：
1．$\checkmark$ Bold Check Mark indicates which mode benefits most from project
2．Cost estimates are provided for draft alternatives with defined scope／extents．Cost Estimates do not include right－of－way，utility relocation，new utilities or hazmat costs．
ODOT＝Oregon Department of Transportation；OCBR＝Oregon Coast Bike Route；CCAT＝Coos County Area Transit；OFP＝Oregon Freight Plan；POCB＝Port of Coos Bay；CCAD＝Coos County Airport District Impacts／Benefits：（＋）Positive；（－）Negative；（／）Neutral；（N／A）Not applicable；（TBD）To Be Determined

## TECHNICAL MEMORANDUM \#8 APPENDIX

System Alternatives (Task 7.5)


Willamette Valley Office 213 Water Ave. NW, Suite 100 Albany, OR 97321

North Coast Office
609 SW Hurbert Street Newport, OR 97365


## -MEMORANDUM.

| TO | Angela Rogge, PE <br> Angela.Rogge@deainc.com <br> David Evans and Associates, Inc. <br> 2100 SW River Pkwy <br> Portland, OR 97201 | DATE | May 14, 2019 | $\begin{array}{ll} \hline \text { JOB NO.: } \\ & \\ 1306-002 \end{array}$ |
| :---: | :---: | :---: | :---: | :---: |
|  |  | ATTN | Angela Rogge |  |
|  |  | RE | Coos Bay/Nor | d TSP Cost Estimates |

Willamette Valley Office
213 Water Ave．NW，Suite 100 Albany，OR 97321

Tel［541） $566-8601$ •Fax（541）266－8681

Angela，

I＇ve completed most of the cost estimates sent over by David Evans and Associates．Seven of them were omitted due to budget constraints．Those that were chosen to be omitted were chosen due to a lack of information or clarity on scope．

I＇ve attached a master list of the projects along with their total cost and any specific assumptions that were made．In addition to these specific assumptions，there are general assumptions that were made on the majority of the projects such as：
$>$ Along curb and gutter，a 2＇strip of asphalt is assumed in order to conform to grades．
$>$ Sign costs are calculated at $\$ 500$ per sign multiplied by a factor of 1.5
＞Asphalt is assumed to be 4 ＂of HMAC over 12 ＂of aggregate base．
$>$ Aggregate base is assumed at a depth of $4 "$ for sidewalks，and $6 "$ for driveways and curb and gutter．
$>$ Drainage is based on an average cost per lineal foot of project length．
$>$ One water quality feature is included per approximately 1,000 lineal feet of project length where applicable．
$>$ Driveway widths are based on a rough measured width plus approximately $15^{\prime}$ for the wings．
$>$ Signs，ADA ramps，and additional footage for curb returns are evaluated on an individual basis for each project．

I＇ve also attached a PDF of all of the cost estimates covered．

Respectfully，

## Civil West Engineering Services

Sean Lloyd，PE
Project Engineer

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 - Sheridan Ave - Florida Avenue to Bayview Avenue |  |  |  | countr $\mathrm{CO}$ | COOS |
| $\begin{aligned} & \hline \text { PROJECT\# } \\ & 1306-002 \end{aligned}$ | KIND OF WORK Pedestrian Improvements | Length | $\begin{aligned} \hline \text { DATE } \\ 5 / 7 / 19 \\ \hline \end{aligned}$ | ROADWAY DESIGNER <br> Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$71,300 | \$71,300 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$35,650 | \$35,650 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$14,260 | \$14,260 |
|  | CLEARING AND GRUBBING | ACRE | 0.23 | \$4,000 | \$940 |
|  | GENERAL EXCAVATION | CY | 369 | \$30 | \$11,090 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 37 | \$75 | \$2,780 |
|  | CONCRETE CURB \& GUTTER | FOOT | 1,860 | \$20 | \$37,200 |
|  | CONCRETE SIDEWALK | SQFT | 8,965 | \$16 | \$143,440 |
|  | CONCRETE DRIVEWAY | SQFT | 1,265 | \$20 | \$25,300 |
|  | EXTRA FOR ADA RAMP | EA | 4 | \$3,500 | \$14,000 |
|  |  |  |  |  |  |
| DRAINAGE |  |  |  |  |  |
|  | DRAINAGE SYSTEM | FOOT | 930 | \$100 | \$93,000 |
|  | WATER QUALITY | EACH | 1 | \$30,000 | \$30,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 404 | \$50 | \$20,222 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 128 | \$210 | \$26,860 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$6,000 | \$6,000 |
|  | STRIPING | FOOT | 930 | \$2.00 | \$1,860 |
|  | RAILROAD CROSSING | LS | 1 | \$300,000.00 | \$300,000 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$21,390 | \$21,390 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$713,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  |  | \$856,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$514,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$1,370,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.


NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.


NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECTION |  |  |  | county |  |
| 4 - Newmark Street - Broadway Avenue to West City Limits |  |  |  | coos |  |
| $\begin{array}{r} \hline \text { PROJECT \# } \\ 1306-002 \\ \hline \end{array}$ | Pedestrian Improvements | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ \\ 5 / 8 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER <br> Civil West | Civil West Engineering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$4,400 | \$4,400 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$1,760 | \$1,760 |
|  | GENERAL EXCAVATION | CY | 228 | \$30 | \$6,840 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 23 | \$75 | \$1,710 |
|  | CONCRETE MEDIAN | FOOT | 1,800 | \$20 | \$36,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 229 | \$50 | \$11,460 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 124 | \$210 | \$25,990 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$3,750 | \$3,750 |
|  | STRIPING | FOOT | 900 | \$2.00 | \$1,800 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$2,640 | \$2,640 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$88,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$107,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$65,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$172,000 |

NOTES: This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 5 - Newmark Street - Highway 101 to Sherman Avenue |  |  |  | county | COOS |
| $\begin{aligned} & \hline \text { PROJECT\# } \\ & 1306-002 \end{aligned}$ | KIND OF WORK $\quad$ Pedestrian Improvements | Length | $\begin{aligned} \hline \text { DATE } \\ 5 / 7 / 19 \\ \hline \end{aligned}$ | ROADWAY DESIGNER <br> Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$51,400 | \$51,400 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$25,700 | \$25,700 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$10,280 | \$10,280 |
|  | CLEARING AND GRUBBING | ACRE | 0.14 | \$4,000 | \$570 |
|  | GENERAL EXCAVATION | CY | 1,121 | \$30 | \$33,650 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 112 | \$75 | \$8,420 |
|  | CONCRETE CURB \& GUTTER | FOOT | 1,110 | \$20 | \$22,200 |
|  | CONCRETE SIDEWALK | SQFT | 6,105 | \$16 | \$97,680 |
|  | EXTRA FOR ADA RAMP | EA | 4 | \$3,500 | \$14,000 |
|  |  |  |  |  |  |
| DRAINAGE |  |  |  |  |  |
|  | DRAINAGE SYSTEM | FOOT | 1,030 | \$100 | \$103,000 |
|  | WATER QUALITY | EACH | 1 | \$30,000 | \$30,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 1,094 | \$50 | \$54,680 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 687 | \$210 | \$144,240 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$3,000 | \$3,000 |
|  | STRIPING | FOOT | 1,030 | \$2.00 | \$2,060 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$15,420 | \$15,420 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$514,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$617,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$371,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$988,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion |  |  |  | county |  |
| 6 - Colorado Avenue - Sidewalks and Crossing |  |  |  | coos |  |
| $\begin{array}{\|l\|} \hline \text { PROJECT\# } \\ 1306-002 \end{array}$ | KIND OF WORK Pedestrian Improvements | Length | $\begin{array}{r} \hline \text { DATE } \\ 5 / 8 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER <br> Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$19,500 | \$19,500 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$9,750 | \$9,750 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$3,900 | \$3,900 |
|  | CLEARING AND GRUBBING | ACRE | 0.08 | \$4,000 | \$330 |
|  | GENERAL EXCAVATION | CY | 124 | \$30 | \$3,740 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 12 | \$75 | \$940 |
|  | CONCRETE CURB \& GUTTER | FOOT | 640 | \$20 | \$12,800 |
|  | CONCRETE SIDEWALK | SQFT | 3,520 | \$16 | \$56,320 |
|  | EXTRA FOR ADA RAMP | EA | 2 | \$3,500 | \$7,000 |
|  |  |  |  |  |  |
| DRAINAGE |  |  |  |  |  |
|  | DRAINAGE SYSTEM | FOOT | 640 | \$100 | \$64,000 |
|  | WATER QUALITY | EACH | 1 | \$30,000 | \$30,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 136 | \$50 | \$6,790 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 44 | \$210 | \$9,240 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$1,500 | \$1,500 |
|  | STRIPING | FOOT | 680 | \$2.00 | \$1,360 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$5,850 | \$5,850 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$195,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$234,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$141,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$375,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion |  |  |  | county |  |
| 7 - Boynton Park - Sherman Avenue Crossing |  |  |  | coos |  |
| $\begin{array}{r} \hline \text { PROJECT \# } \\ 1306-002 \\ \hline \end{array}$ | KIND OF WORK Pedestrian Improvements | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 8 / 19 \\ \hline \end{array}$ | Civil West Engineering | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$1,350 | \$1,350 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$540 | \$540 |
|  | CLEARING AND GRUBBING | ACRE | 0.01 | \$4,000 | \$40 |
|  | GENERAL EXCAVATION | CY | 16 | \$30 | \$470 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 2 | \$75 | \$120 |
|  | CONCRETE CURB \& GUTTER | FOOT | 80 | \$20 | \$1,600 |
|  | CONCRETE SIDEWALK | SQFT | 440 | \$16 | \$7,040 |
|  | EXTRA FOR ADA RAMP | EA | 4 | \$3,500 | \$14,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 17 | \$50 | \$850 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 6 | \$210 | \$1,160 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$1,500 | \$1,500 |
|  | STRIPING | FOOT | 70 | \$2.00 | \$140 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$810 | \$810 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$27,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$40,000 |
|  |  |  |  |  | \$24,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$64,000 |
| NOTES: | This estimate does not include right-of-way, | n, | utilities or | mat costs. |  |



NOTES: This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 10 - Woodland Drive - North City Limits to Ocean Blvd. |  |  |  | COOS |  |
| $\begin{aligned} & \text { PROJECT\# } \\ & 1306-002 \end{aligned}$ | KIND OF WORK $\quad$ Surface \& Drainage | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 8 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER <br> Civil West | ring |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$162,800 | \$162,800 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$81,400 | \$81,400 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$32,560 | \$32,560 |
|  | CLEARING AND GRUBBING | ACRE | 0.93 | \$4,000 | \$3,710 |
|  | GENERAL EXCAVATION | CY | 1,469 | \$30 | \$44,090 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 147 | \$75 | \$11,030 |
|  | CONCRETE CURB \& GUTTER | FOOT | 7,340 | \$20 | \$146,800 |
|  | CONCRETE SIDEWALK | SQFT | 33,523 | \$16 | \$536,360 |
|  | CONCRETE DRIVEWAY | SQFT | 6,848 | \$20 | \$136,950 |
|  | EXTRA FOR ADA RAMP | EA | 16 | \$3,500 | \$56,000 |
|  |  |  |  |  |  |
| DRAINAGE |  |  |  |  |  |
|  | DRAINAGE SYSTEM | FOOT | 3,670 | \$100 | \$367,000 |
|  | WATER QUALITY | EACH | 4 | \$30,000 | \$120,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 1,610 | \$50 | \$80,520 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 505 | \$210 | \$105,980 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$12,000 | \$12,000 |
|  | STRIPING | FOOT | 3,670 | \$2.00 | \$7,340 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$48,840 | \$48,840 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$1,628,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$1,954,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$1,173,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$3,127,000 |

NOTES: This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion |  |  |  | county |  |
| 11 - Thompson Road Crossing |  |  |  | COOS |  |
| $\begin{aligned} & \text { PROJECT \# } \\ & 1306-002 \end{aligned}$ | KIND OF WORK $\quad$ Surface \& Drainage | Length | $\begin{array}{r} \text { DATE } \\ 5 / 8 / 19 \end{array}$ | Civil West Engineering |  |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$700 | \$700 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$280 | \$280 |
|  | GENERAL EXCAVATION | CY | 4 | \$30 | \$120 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 1 | \$75 | \$80 |
|  | CONCRETE CURB \& GUTTER | FOOT | 20 | \$20 | \$400 |
|  | CONCRETE SIDEWALK | SQFT | 110 | \$16 | \$1,760 |
|  | EXTRA FOR ADA RAMP | EA | 2 | \$3,500 | \$7,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 5 | \$50 | \$250 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 10 | \$210 | \$2,100 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$1,500 | \$1,500 |
|  | STRIPING | FOOT | 50 | \$2.00 | \$100 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$420 | \$420 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$14,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$25,000 |
|  |  |  |  |  | \$15,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$40,000 |



NOTES: This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion | 13 - Wallace Street |  |  | county |  |
|  |  |  |  |  |  |
| $\begin{array}{\|l\|} \hline \text { PROJECT \# } \\ 1306-002 \end{array}$ | KIND OF WORK $\quad$ Grading, Paving \& Drainage | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 6 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER <br> Civil West Engineering |  |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$20,500 | \$20,500 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$10,250 | \$10,250 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$4,100 | \$4,100 |
|  | CLEARING AND GRUBBING | ACRE | 0.09 | \$4,000 | \$350 |
|  | GENERAL EXCAVATION | CY | 135 | \$30 | \$4,050 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 13 | \$75 | \$1,020 |
|  | CONCRETE CURB \& GUTTER | FOOT | 680 | \$20 | \$13,600 |
|  | CONCRETE SIDEWALK | SQFT | 3,300 | \$16 | \$52,800 |
|  | CONCRETE DRIVEWAY | SQFT | 440 | \$20 | \$8,800 |
|  | EXTRA FOR ADA RAMP | EA | 3 | \$3,500 | \$10,500 |
|  |  |  |  |  |  |
| DRAINAGE |  |  |  |  |  |
|  | DRAINAGE SYSTEM | FOOT | 620 | \$100 | \$62,000 |
|  | WATER QUALITY | EACH | 1 | \$30,000 | \$30,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 148 | \$50 | \$7,390 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 47 | \$210 | \$9,820 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$3,000 | \$3,000 |
|  | STRIPING | FOOT | 680 | \$2.00 | \$1,360 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$6,150 | \$6,150 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$205,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$246,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$148,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$394,000 |
| NOTES: | This estimate does not include right-of-way, u | n, n | utilities or | zmat costs. |  |


| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECTION 15 - Front Street |  |  |  | county |  |
|  |  |  |  | coos |  |
| $\begin{aligned} & \text { PROJECT \# } \\ & 1306-002 \\ & \hline \end{aligned}$ | KIND OF WORK Surface \& Drainage | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 6 / 19 \end{array}$ | ROADWAY DESIGNER <br> Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$62,200 | \$62,200 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$31,100 | \$31,100 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$12,440 | \$12,440 |
|  | CLEARING AND GRUBBING | ACRE | 0.28 | \$4,000 | \$1,120 |
|  | GENERAL EXCAVATION | CY | 452 | \$30 | \$13,580 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 45 | 75.00 | \$3,400 |
|  | CONCRETE CURB \& GUTTER | FOOT | 2,210 | \$20 | \$44,200 |
|  | CONCRETE SIDEWALK | SQFT | 8,470 | \$16 | \$135,520 |
|  | CONCRETE DRIVEWAY | SQFT | 3,685 | \$20 | \$73,700 |
|  |  |  |  |  |  |
| DRAINAGE |  |  |  |  |  |
|  | DRAINAGE SYSTEM | FOOT | 2,210 | \$100 | \$221,000 |
|  | WATER QUALITY | EACH | 2 | \$30,000 | \$60,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 497 | \$50 | \$24,870 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 152 | \$210 | \$31,910 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$7,500 | \$7,500 |
|  | STRIPING | FOOT | 2,210 | \$2.00 | \$4,420 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$18,660 | \$18,660 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$622,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$746,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$448,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$1,194,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.


NOTES: This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECTION |  |  |  | county |  |
| 18 - Newmark Avenue - Broadway Avenue to West City Limits |  |  |  | coos |  |
| $\begin{aligned} & \hline \text { PROJECT \# } \\ & 1306-002 \\ & \hline \end{aligned}$ | KIND OF WORK Bicycle Improvements | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 8 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$450 | \$450 |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | BICYLE SIGNS | EA | 10 | \$750 | \$7,500 |
|  | SHARROW STRIPING | EA | 2 | \$500 | \$1,000 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$270 | \$270 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$9,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$20,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$12,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$32,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.



NOTES: This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECTION |  |  |  | county |  |
| 21 - Newmark Avenue - Ackermann Street to Cammann Street |  |  |  | COOS |  |
| $\begin{gathered} \hline \text { PROJECT\# } \\ 1306-002 \\ \hline \end{gathered}$ | KIND OF WORK Bicycle Improvements | LENGTH | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 10 / 19 \\ \hline \end{array}$ | roadway designer Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$250 | \$250 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$100 | \$100 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | STRIPING | FOOT | 2,160 | \$2.00 | \$4,320 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$150 | \$150 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$5,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$15,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$9,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$24,000 |


| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECTION |  |  |  | county |  |
| 22 - Woodland Drive - North City Limits to Woodland Boulevard |  |  |  | COOS |  |
| $\begin{gathered} \text { PROJECT\# } \\ 1306-002 \end{gathered}$ | KIND OF WORK $\quad$ Bicycle Improvements | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 10 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$550 | \$550 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$220 | \$220 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SHARROW STRIPING | FOOT | 22 | \$500.00 | \$11,000 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$330 | \$330 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$11,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$23,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$14,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$37,000 |


| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion |  |  |  | county |  |
| 23 - D Street/Coos River Road - 6th Avenue to East City Limits |  |  |  | coos |  |
| PROJECT\# <br> $1306-002$ | KIND OF WORK Surface \& Drainage | LENGTH | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 10 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$35,900 | \$35,900 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$17,950 | \$17,950 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$7,180 | \$7,180 |
|  | CLEARING AND GRUBBING | ACRE | 0.71 | \$4,000 | \$2,840 |
|  | GENERAL EXCAVATION | CY | 1,144 | \$30 | \$34,340 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 114 | \$75 | \$8,590 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 1,431 | \$50 | \$71,530 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 1,062 | \$210 | \$223,060 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$8,250 | \$8,250 |
|  | STRIPING | FOOT | 5,150 | \$2.00 | \$10,300 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$10,770 | \$10,770 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$359,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$431,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$259,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$690,000 |
| NOTES: | This estimate does not include right-of-way, | , | tilities O | mat costs. |  |


| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion |  |  |  | county |  |
| 26 - Pony Creek Road at Crowell Lane |  |  |  | COOS |  |
| $\begin{array}{r} \text { PROJECT\# } \\ 1306-002 \\ \hline \end{array}$ | KIND OF WORK Surface \& Drainage | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 10 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER <br> Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$900 | \$900 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$360 | \$360 |
|  | GENERAL EXCAVATION | CY | 50 | \$30 | \$1,500 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 5 | \$75 | \$380 |
|  | CONCRETE CURB \& GUTTER | FOOT | 200 | \$20 | \$4,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 63 | \$50 | \$3,130 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE MHMAC MIXTURE | TON | 14 | \$210 | \$2,890 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS \& CROSSING | LS | 1 | \$2,250 | \$2,250 |
|  | STRIPING | FOOT | 1,550 | \$2.00 | \$3,100 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$540 | \$540 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$18,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$30,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$18,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$48,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECTIon |  |  |  | county |  |
| 27 - US 101 South - South of Johnson Avenue |  |  |  | COOS |  |
| $\begin{aligned} & \hline \text { PROJECT \# } \\ & 1306-002 \\ & \hline \end{aligned}$ | KIND OF WORK Surface \& Drainage | LENGTH | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 10 / 19 \\ \hline \end{array}$ | Roadway designer Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION | LS | 1 | \$10,000 | \$10,000 |
|  | TRAFFIC CONTROL | LS | 1 | \$2,000 | \$2,000 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$20 | \$20 |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | STRIPING | FOOT | 350 | \$2.00 | \$700 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$30 | \$30 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$1,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$13,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$8,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$21,000 |

NOTES: $\quad$ This estimate does not include right-of-way, utility relocation, new utilities or hazmat costs.

| PRELIMINARY COST ESTIMATE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SECtion |  |  |  | county |  |
| 28 - US 101-Near Kruse Avenue |  |  |  | coos |  |
| $\begin{aligned} & \text { PROJECT \# } \\ & 1306-002 \end{aligned}$ | KIND OF WORK $\quad$ Bicycle Improvements | Length | $\begin{array}{\|r\|} \hline \text { DATE } \\ 5 / 10 / 19 \\ \hline \end{array}$ | ROADWAY DESIGNER <br> Civil West | ering |
| ITEM NUMBER | ITEM DESCRIPTION | UNIT | AMOUNT | UNIT COST | TOTAL |
| MOBILIZATION AND TRAFFIC CONTROL |  |  |  |  |  |
|  | MOBILIZATION(10\%) | LS | 1 | \$49,800 | \$49,800 |
|  | TRAFFIC CONTROL (5\%) | LS | 1 | \$24,900 | \$24,900 |
| ROADWAY |  |  |  |  |  |
|  | REMOVAL OF STRUCTURES AND OBSTRUCTIONS (2\%) | LS | 1 | \$9,960 | \$9,960 |
|  | GENERAL EXCAVATION | CY | 1,971 | \$30 | \$59,130 |
|  | SUBGRADE/FOUNDATION STABILIZATION | CY | 197 | \$75 | \$14,790 |
|  | CONCRETE CURB \& GUTTER | FOOT | 2,150 | \$20 | \$43,000 |
|  |  |  |  |  |  |
| BASES |  |  |  |  |  |
|  | AGGREGATE BASE | CY | 1,866 | \$50 | \$93,320 |
|  |  |  |  |  |  |
| WEARING SURFACES |  |  |  |  |  |
|  | LEVEL 3, 1/2 INCH DENSE HMAC MIXTURE | TON | 1,330 | \$210 | \$279,370 |
|  |  |  |  |  |  |
| PERMANENT TRAFFIC CONTROL AND GUIDANCE DEVICES |  |  |  |  |  |
|  | SIGNS | LS | 1 | \$6,000 | \$6,000 |
|  | STRIPING | FOOT | 1,125 | \$2.00 | \$2,250 |
|  |  |  |  |  |  |
| RIGHT OF WAY DEVELOPMENT |  |  |  |  |  |
|  | LANDSCAPE AND EROSION CONTROL (3\%) | LS | 1 | \$14,940 | \$14,940 |
|  |  |  |  |  |  |
|  | CONSTRUCTION SUBTOTAL (without MOB/TRAFFIC CONTROL/REMOVAL/LS) |  |  |  | \$498,000 |
| CONSTRUCTION SUBTOTAL (with MOB/TRAFFIC CONTROL/REMOVAL) |  |  |  |  | \$598,000 |
|  | ENGINEERING \& CONTINGENCIES |  |  | 60\% | \$359,000 |
| TOTAL CONSTRUCTION COST |  |  |  |  | \$957,000 |

## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#9:
Preferred Alternative Selection

## TECHNICAL MEMORANDUM \#9

## Preferred Alternative Selection (Task 8.1)

Date: January 31, 2020<br>To: City of Coos Bay City of North Bend Oregon Department of Transportation, Region 3<br>From: Angela Rogge, PE, Justine Kuenne, EIT, David Evans and Associates, Inc.<br>Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates

## Table of Contents

Basis for Selection ..... 2
Preferred Alternatives ..... 2
City of North Bend ..... 2
Bicycle and Pedestrian ..... 2
Public Transportation. ..... 8
Roadway ..... 9
Air, Water, Rail and Pipeline ..... 13
Safety and Operational Analysis ..... 14
City of Coos Bay ..... 16
Bicycle and Pedestrian ..... 16
Public Transportation. ..... 21
Roadway ..... 21
Safety and Operational Analysis ..... 26
Air, Water, Rail and Pipeline ..... 28
Preferred Project Maps ..... 29
Project Sheets ..... 32

This memorandum outlines preferred alternatives identified from the draft system alternatives in Technical Memorandum \#8. It identifies the basis for selection and includes each project's effects on traffic operations, future safety, and future multimodal improvements. The preferred alternatives work to address identified deficiencies in connectivity, amenities, safety, and operations.

The alternatives presented in this memorandum are intended to serve as the baseline for a prioritized list of "financially feasible" and "aspirational" projects. The funding plan will be further detailed in Technical Memorandum \#10 (Transportation Improvement Finance Program).

## Basis for Selection

This section discusses the basis for selecting the preferred alternatives from the draft system alternatives. Selections are based on three primary factors:

- Stakeholder Feedback via in-person meetings with the PAC, conference calls with technical Agency staff, comments received on technical memoranda, and project team communications
- Previous Plans (such as 2004 TSPs)
- Fatal Flaw Analysis against adopted standards and plans

The development of the preferred alternatives was an iterative process that created a menu of potential improvements. Stakeholder feedback and fatal flaw analysis helped to refine the list of concepts presented in this memorandum.

In addition to project descriptions and details of any analysis, project sheets were developed for projects and are included at this end of this memorandum. Project sheets were developed for projects where conceptual diagrams could be developed.

## Preferred Alternatives

This section is broken out by each City and includes sections for the modal elements of the TSP. For projects requiring empirical analysis, a summary of the analysis and anticipated impacts is provided.

## City of North Bend

Bicycle and Pedestrian
The pedestrian and bicycle element includes a citywide Bike Route map, a Safe Routes to school boundary as well as a list of projects to address the needs of bicycles and pedestrians.

## Bike Routes

The Bike Route map identifies a citywide network of interconnected bike routes that would enable people to satisfy their daily travel needs within the city or surrounding region by bicycle. As illustrated in Figure 1, the network would provide connections to key local destinations, including schools, parks, the library, downtown North Bend, and other identified activity centers. The classifications help define the type of bicycle treatments planned for each roadway. This is an effort to more clearly prioritize and define the "Bicycle Action Plan" in the previous 2004 TSP.

- Type I Bike Routes (Separated): These facilities would consist of routes that separate bicycles from vehicular traffic with a physical barrier or striped buffer. Type I Bike Routes in North Bend
are primarily shared use paths. Type I bike routes are intended to provide more separation and protection for cyclists from vehicles than a standard shoulder or bike lane.
- Type II Bike Routes (Striped): These routes would facilitate circulation within North Bend using bike lanes with a minimum width of 5 feet. Type II facilities would provide access between residential neighborhoods and local destinations, primarily on collector and arterial streets.
- Type III Bike Routes (Neighborhood): These neighborhood shared routes would be located mostly on residential and collector streets with low traffic volumes and speeds. They are designed to provide safe, comfortable, low-stress access within neighborhoods and for individuals of all bicycling confidence levels. Bicycle-specific infrastructure would consist of painted sharrow markings and signage to provide wayfinding. In some cases, Type III bike routes may serve as a parallel route if a Type I or II facility is not feasible on an arterial or collector roadway.

Oregon Coast Bike Route: The Oregon Coast Bike Route (OCBR) spans the Oregon coastline from Astoria to Brookings, primarily on US 101. It connects coastal communities, recreational destinations and viewpoints. Through North Bend, the OCBR is signed along US 101 from the north to and along Cape Arago Highway.

The OCBR is currently undergoing an update to improve the experience of biking on the route. Recommendations could include everything from wayfinding signs and secure bike parking to transit connections to and from the route, or educational campaigns to inform drivers and riders about how to safely share the road. The City of North Bend supports the update of the OCBR and supports providing local connections to the route.

## Safe Routes to School

Sidewalk infill, enhanced street crossings, and dedicated bicycle facilities create safer routes between neighborhoods and schools. Improved local street connectivity shortens travel routes through neighborhoods, making walking and biking trips easier. To highlight where bicycle and pedestrian projects fall within a one-mile radius of a school, a boundary will be added to the modal plan maps in the TSP. The one-mile buffer boundary is depicted on Figure 2. ODOT has also developed an online GIS tool that allows users to access features of the school and crash history that may support grant applications. ${ }^{1}$

[^49]
## Coos Bay/North Bend TSP



Urban Growth Boundary (UGB)

## Bicycle Route Plan

- Future Type I (Separated)
- =- Future Type II (Striped)
- Existing Type II (Striped)
=- =- Future Type III (Neighborhood Route)
- Oregon Coast Bike Route

Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online


U-". Urban Growth Boundary (UGB)

- North Bend Public Schools

Lー』 Schools 1-mile Boundary

## Bicycle and Pedestrian Improvements

Table 1 summarizes the bicycle and pedestrian projects that are proposed for inclusion in the TSP update. Projects with the school $(\boldsymbol{l})$ symbol indicate the project is within a 1-mile radius of a school and may be eligible for Safe Routes to School funding.

Table 1: City of North Bend Preferred Bicycle and Pedestrian Alternatives

| $\begin{aligned} & \text { NB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| PEDESTRIAN |  |  |  |  |  |
| 1 | Sheridan Ave Pedestrian Improvements | Sheridan Ave: Florida Ave to Bayview Ave | Add sidewalk on Sheridan Ave and upgrade RR crossing to connect Simpson Heights to downtown | North Bend | \$1.4M |
| 2 | $16^{\text {th }} \mathrm{St} / 17^{\text {th }} \mathrm{St}$ <br> Sidewalks | 16th St/17th: <br> Broadway Ave to Oak St | Add sidewalk to provide connectivity to schools east of Broadway Ave via 16th St | North Bend | \$2.1M |
| $\stackrel{3}{1}$ | Oak St Neighborhood Greenway | Oak St: Colorado Ave to Newmark Ave | Establish Neighborhood Greenway (traffic calming measures and wayfinding) to improve pedestrian environment | North Bend | TBD |
| 1 | North Bend High School Pedestrian Crossings | Pacific St: Crowell Ln to 16th St | Sidewalk on west side and enhanced crossings (visibility) | North Bend | \$730k |
| $\stackrel{5}{1}$ | Virginia Ave Access Consolidation | Virginia Ave: US 101 to Broadway Ave | Identify opportunities for access consolidation (with redevelopment/change of use). | ODOT | TBD |
| 6 | Virginia Ave Pedestrian Crossing | Virginia Ave: Pony Creek Village to Broadway Ave | Provide pedestrian crossing between Broadway Ave and Pony Creek Village | ODOT | TBD |
| 7 | Newmark Ave Access Management | Newmark Ave: Broadway Ave to West City Limits | Access consolidation and medians | ODOT | \$175k |
| 8 | Newmark St Half Street Improvement | Newmark St: US 101 to Sherman Ave | Half street improvement Sherman Ave to US 101 to provide westbound bicycle and pedestrian facilities | North Bend | \$1M |
| 9 | North Bend Senior <br> Activity Center <br> Pedestrian Improvements | North Bend Senior Center | Marked crossing of Colorado Avenue and sidewalks from transit stop to Activity Center | North Bend | \$375k |
| 10 | Boynton Park Pedestrian Crossing | Boynton Park | Marked crossing of Sherman Avenue at Exchange Street transit stop | North Bend | \$65k |
| 11 | North US 101 <br> Pedestrian Crossing | US 101 north of Florida Ave | Identify preferred location for pedestrian crossing of US 101. Locate near visitor center to provide connectivity to Simpson Park | ODOT | TBD |


| $\begin{aligned} & \text { NB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | Connect the Boardwalks | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five mile uninterrupted boardwalk. | North <br> Bend; <br> Coos <br> Bay; <br> Private | TBD |
| 13 | Broadway Ave <br> Pedestrian Facilities | Broadway Ave between Virginia and Newmark | Improve sidewalks and PLTS | ODOT | TBD |
| 14 | North Bend Middle School Safe Routes to School | Maine Ave/Broadway Ave | Rapid Flashing Beacon and pedestrian refuge island on Broadway Ave at Maine Ave for North Bend Middle School students. Sidewalk infill on $14^{\text {th }}$ St and Pacific Ave to create a complete route for students walking or biking to school. Recommend a pedestrian crossing at Broadway/14th. | Safe <br> Routes to School | Funded |
| $\stackrel{41}{\perp}$ | Newmark St Sidewalk | Newmark St: Sherman Ave to Broadway Ave | Provide sidewalk on the north side of the street | North Bend | TBD |
| BICYCLE |  |  |  |  |  |
| $\begin{aligned} & 15 \\ & \perp \end{aligned}$ | Cape Arago Highway Bicycle Lanes | Cape Arago Highway: <br> a) Virginia Ave <br> b) Broadway Ave <br> c) Newmark Ave | Provide bicycle facilities through coordination with the OCBR (Priority Virginia Ave to 16th St): <br> a) Virginia Avenue Shared Use Path <br> b) Broadway Avenue Bicycle Lanes <br> c) Newmark Avenue Parallel Route | ODOT | TBD |
| 16 | NW North Bend Bicycle Facilities | Virginia/Maple Leaf/Colorado | Stripe bicycle facilities (with repaving project) | North <br> Bend | \$1.6M |
| 17 | Sheridan Ave Bicycle Facilities | Sheridan Ave: Florida Ave to Bayview Ave | Provide bicycle facilities through signing/striping | North Bend | See <br> Project 9 |
| 18 | Newmark St Bicycle Facilities | Newmark St: Sherman Ave to Broadway Ave | Provide bicycle facilities restriping (with repaving project) | North Bend | \$6.1M |
| 19 | US 101 | US 101 | Provide bicycle facilities (OCBR priority) through parallel routes | ODOT | TBD |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Public Transportation

Public transportation service within Coos County is provided by Coos Countr Area Transit Service District (CCAT) and is not funded directly by the City. North Bend can support future transit viability by designing and building streets accessible by pedestrian and bicycle modes.

## Transit Projects

The following concepts are suggested as opportunities for the City to collaborate with, or otherwise support, the Transit District in order to improve public transportation services in the Bay Area.

Table 2: City of North Bend Preferred Transit Alternatives

| ID | Project Name | Location | Description | Primary Funding Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| TRANSIT |  |  |  |  |  |
| 20 | Bay Area Loop Weekend Service | Bay Area Loop | Add weekend service | CCAT | N/A |
| 21 | Transit Service Hours | All Transit Routes | Extend service hours | CCAT | N/A |
| 22 | Transit Frequency | US 101 \& Sherman Ave | Increase frequency \& add additional route | CCAT | N/A |
| 23 | Shelters and Stops | All Transit Routes | Add shelters and stops near community destinations | CCAT | N/A |
| 24 | Bike/Ped Transit Connectivity | All Transit Routes | Improve bicycle and pedestrian connectivity to stops | North Bend | Projects identified in Bike/Ped plans |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Roadway

This section summarizes the updated functional classification plan and the preferred alternatives for streets, freight, bridges, intersections and safety improvements.

## Functional Classification Plan

Street functional classification indicates purpose, design and function. The assigned functional classification ensures a street network with features that support demand from both the surrounding land uses and travel needs at a regional level.

## CONSISTENCY WITH FEDERAL NAMING CONVENTIONS

It is important to align North Bend's functional classification naming conventions with federal naming conventions as it may facilitate future efforts to obtain federal funding for local improvement projects. Suggested updates to North Bend's classification designations are shown in Table 3.

The City's previous TSP has a "Neighborhood Route" classification. The proposed classification change would differentiate between major and minor collectors.

Table 3. North Bend Proposed Functional Classification Naming Conventions

| Existing Classification Name | Proposed Classification Name |
| :---: | :---: |
| Principal Arterial (ODOT) | Principal Arterial (ODOT) |
| Minor Arterial (ODOT) | Minor Arterial (ODOT) |
| Arterial | Minor Arterial |
| Collector | Major Collector |
| Neighborhood Route | Minor Collector |
| Local | Local |

Bold indicates a proposed change in classification

## SUGGESTED FUNCTIONAL CLASSIFICATION SYSTEM

The suggested functional classification system for roadways in North Bend is described below. The functional classification map, Figure 3, shows the suggested classification for all roadways in the city.

General descriptions of the classifications include:
Principal Arterials are typically freeways and state highways that provide the highest level of connectivity. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterials or collectors.

Minor Arterial streets serve to interconnect and support the principal arterial highway system and are often used as a transition between Principal Arterials and Collectors. These streets link major commercial, residential, industrial and institutional areas.

Major Collector streets provide both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.

Minor Collector streets serve mostly residential or mixed land uses. While through traffic connectivity is not a typical function, they may carry limited amounts.

Local streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

Depending on the road characteristics and function, neighborhood traffic management measures may be appropriate. However, it should not be construed that these routes automatically get speed cushions or any other measures. While these treatments can be beneficial, neighborhood traffic management is only one means of retaining neighborhood character and vitality.

## SUGGESTED FUNCTIONAL CLASSIFICATION CHANGES

Table 4 summarizes the suggested changes to the existing functional classification of specific streets in North Bend.

Table 4. Proposed City Functional Classification Changes for Existing Streets

| Street | Existing City Functional <br> Classification | Proposed Functional <br> Classification |
| :--- | :---: | :---: |
| Arthur Street: Colorado Ave to Virginia Ave | Collector | Minor Collector |
| Colorado Ave: Arthur St to West End | Local | Major Collector |

Note: All streets currently classified as Collectors are proposed to become Major Collectors and all streets currently classified as Neighborhood Routes are proposed to become Minor Collectors unless otherwise noted in this table.

:----: Urban Growth Boundary (UGB)

| Classification |
| :---: |
| State |
| Highway |$\quad$ city $\quad$| Principal Arterial |
| :--- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
| Minor Arterial |
| Major Collector Collector |
| National Highway System |



Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Roadway Improvements

North Bend's preferred alternatives for roadway are summarized in Table 5. It is important to highlight that the community has underscored the need for fixing potholes and addressing pavement condition deficiencies before capital investment in other roadway projects.

Table 5: City of North Bend Preferred Alternatives - Roadway

| $\begin{aligned} & \text { NB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SAFETY |  |  |  |  |  |
| 25 | Virginia Ave/Meade Ave Traffic Calming | Virginia Ave at Meade Ave | Traffic calming along Meade and Connecticut: Narrow up street feeling (bulb outs, speed humps, formalize on street parking) -- Mimic aspects of Downtown Streetscape. | North <br> Bend <br> (Urban Renewal) | TBD |
| 26 | Washington Ave/US 101 Pedestrian Crossing Enhancements | Washington Ave at US 101 <br> South/Sherman Ave | Enhanced pedestrian signage. | ODOT | \$5k-\$30k |
| 27 | Pony Creek Rd/Crowell Ln Intersection Modification | Pony Creek Rd at Crowell Ln | Tighten radius of western curbs, pavement markings, formalize striping on Pony Creek Rd and consider all-way stop control | North Bend | \$50k |
| 28 | State St Visibility | OR 540 near State St | Explore enhanced striping/channelization/overhead signage to improve sight distance and driver expectancy. | ODOT | TBD |
| 29 | Newmark St/Brussels St Visibility | Newmark St near Brussels St | Improve visibility by repave and restripe | North Bend | \$850k |
| 30 | Newmark St/Sherman Ave Visibility | Newmark St at Sherman Ave | Improve visibility by repave and restripe | North Bend | \$850k |
| ROADWAY |  |  |  |  |  |
| 31 | Fix Potholes | City wide | Fix Potholes. <br> Maintain/fix/strengthen existing pavement system, account for maintenance in funding plan. Critical: Arterials and collectors with fair or worse pavement conditions, such as $16^{\text {th }} \mathrm{St}, 17^{\text {th }} \mathrm{St}$, Arthur St, Brussels St, Colorado Ave, Crowell Ln, Harrison Ave, Pacific St, Pony Creek St. | North Bend | \$16.5M |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area
Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Air, Water, Rail and Pipeline

The following describes identified needs and improvements related to the air, water, rail, and pipeline modes. The majority of the projects in this section are opportunities for the City to collaborate with, or otherwise support, the lead agency.

## Air, Water, Rail and Pipeline Improvements

Table 6: City of North Bend Preferred Alternatives - Other

| $\begin{aligned} & \text { NB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. <br> Cost <br> Estimate <br> (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| RAIL/TRUCK FREIGHT |  |  |  |  |  |
| 32 | Lewis Street/Mill Casino Signal Head | US 101 at Lewis Street/Mill Casino | Address Highway OverDimension Load Pinch Point by raising signal head | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | \$250k |
| 33 | California Ave Upgrades | California Ave between Sherman Ave, US 101 and the Dock Facility/North Bend Boardwalk | Address poor pavement condition, widen roadway, improve safety at rail crossing, improve turning movements for one-way portion per OFP | ODOT <br> (OFP); <br> North Bend (pavement) | \$2M |
| MARINE/AIRPORT |  |  |  |  |  |
| 34 | North Bend City Dock | City Dock: Virginia Ave/Harbor Ave | Construct a new city dock at the eastern terminus of Virginia Ave (per Downtown Waterfront District Master Plan) | North Bend | TBD |
| 35 | Marine Ways <br> Enhancements | Charleston boatyard | Improvements that include the Marine Ways | POCB | N/A |
| 36 | North Spit Improvements | Oregon Gateway | North Spit improvements to accommodate a multi-modal marine facility to handle bulk cargo, containers and an LNG export facility | POCB | N/A |
| 37 | Channel Widening/Deepening | Coos Bay | Federal channel widening and deepening to accommodate larger ships / safer operations | POCB | N/A |
| 38 | Charleston Boatyard Dock Replacements | Charleston boatyard | Dock replacements | POCB | N/A |
| 39 | Expanded Passenger Service | Airport | Add direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland) | CCAD | N/A |
| 40 | Airport Transit Service | Airport | Provide transit service to airport if air passenger service increases | CCAT | N/A |

## Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).

ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Safety and Operational Analysis

The projects requiring traffic operational or safety analysis are summarized below. For projects that may impact roadway or intersection capacity, traffic operations are reported for future conditions. For projects developed to specifically address a safety concern, the potential relative crash percentile reduction was determined. Table 7 summarizes the results.

Table 7. North Bend Safety and Operational Analysis

| NB ID | Project | Traffic Operations | Crash Reduction Factor: Potential Relative Crash Reduction |
| :---: | :---: | :---: | :---: |
| BICYCLE |  |  |  |
| 15a | Cape Arago Hwy Bicycle Facilities (Virginia Ave): <br> Provide bicycle facilities on Virginia Ave through parallel route, share use path and coordination with the OCBR | Project not expected to significantly impact roadway or intersection capacity. <br> Note: A road diet was evaluated but is not a preferred alternative. | - Install shared use path: $25 \%$ Effectiveness |
| 15b | Cape Arago Hwy Bicycle Facilities (Broadway Ave): <br> Provide bicycle facilities on Broadway Ave through restriping/road diet and coordination with the OCBR | - No Build: TSP intersections meet mobility targets <br> - With Project: TSP intersections meet mobility targets. Side street movements at 17th expected to experience more delay during peak hour. | - Convert Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet): 29\% Effectiveness |
| 15c | Cape Arago Hwy Bicycle Facilities (Newmark Ave): <br> Provide a parallel route to Newmark Ave with sharrows and wayfinding on local system. | Project not expected to significantly impact roadway or intersection capacity. | - Convert Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet): 29\% Effectiveness |
| 30 | Newmark St Bicycle Facilities: <br> Provide bicycle facilities on Broadway Ave through restriping/road diet and coordination with repaving project | - No Build: TSP intersections meet mobility targets <br> - With Project: TSP intersections meet mobility targets with negligible change from No Build. | - Convert Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet): 29\% Effectiveness |
| SAFETY CONCERN |  |  |  |
| 25 | Virginia Ave at Meade Ave Traffic Calming: <br> Narrow up street feeling (bulb outs, speed humps, formalize on street parking) -- Mimic aspects of Downtown Streetscape. | Project not expected to significantly impact roadway or intersection capacity | - Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs: 37\% Effectiveness <br> - Install speed humps: 50\% Effectiveness |


| NB ID | Project | Traffic Operations | Crash Reduction Factor: Potential Relative Crash Reduction |
| :---: | :---: | :---: | :---: |
| 26 | Washington Ave at US 101 South/Sherman Ave Pedestrian Crossing: <br> Explore options to provide safer pedestrian crossing of highway (curb bulb outs, RRFB, median refuge, lighting, signage). <br> Pedestrian signage is most viable option. | Project not expected to significantly impact roadway or intersection capacity | - Install Continental Crosswalk Markings and Advance Pedestrian Warning Signs at Uncontrolled Locations: 15\% Effectiveness <br> - Install Rectangular Rapid Flashing Beacon without Median: 10\% Effectiveness |
| 27 | Pony Creek Rd at Crowell Ln Traffic Control: <br> Tighten radius of western curbs, pavement markings, formalize striping on Pony Creek Rd and consider all-way stop control | - No Build: Meets mobility targets <br> - With Project (all-way stop): Meets mobility targets. Delays decrease on Crowell Ln but increase slightly on Pony Creek Rd | - Convert to All-Way Stop Control (From Urban 2-Way or Yield Control): 18-75\% Effectiveness <br> - Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs: 37\% Effectiveness |
| 28 | OR 540 near State St: <br> Explore enhanced striping/channelization/ overhead signage to improve sight distance and driver expectancy. | Project not expected to significantly impact roadway or intersection capacity | - Increase Triangle Sight Distance: 11-56\% Effectiveness |
| 29 | Newmark St near Brussels St: Improve visibility by repaving, restriping and improving signal hardware | Project not expected to significantly impact roadway or intersection capacity | - Improve Signal Hardware: $15 \%$ 46\% Effectiveness |
| 30 | Newmark St at Sherman Ave Visibility: <br> Improve visibility by repaving, restriping and improving signal hardware | Project not expected to significantly impact roadway or intersection capacity | - Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs: 37\% Effectiveness <br> - Install speed humps: 50\% Effectiveness |

Notes: Detailed traffic operations are located in the Appendix

## City of Coos Bay

## Bicycle and Pedestrian

The pedestrian and bicycle plan includes a citywide Bike Route map as well project lists that identify projects to address the needs of bicycles and pedestrians.

## Bike Routes

The Bike Route map identifies a citywide network of interconnected bike routes that would enable people to satisfy their daily travel needs within the city or surrounding region by bicycle. As illustrated in Figure 4, the network would provide connections to key local destinations, including schools, parks, the library, downtown Coos Bay, and other identified activity centers. The classifications help define the type of bicycle treatments planned for each roadway. This is an effort to more clearly prioritize and define the "Bicycle Action Plan" in the previous 2004 TSP.

- Type I Bike Routes (Separated): These facilities would consist of routes that separate bicycles from vehicular traffic with a physical barrier or striped buffer. Type I Bike Routes in Coos Bay are primarily shared use paths. Type I bike routes are intended to provide more separation and protection for cyclists from vehicles than a standard shoulder or bike lane.
- Type II Bike Routes (Striped): These routes would facilitate circulation within Coos Bay using bike lanes with a minimum width of 5 feet. Type II facilities would provide access between residential neighborhoods and local destinations, primarily on collector and arterial streets.
- Type III Bike Routes (Neighborhood): These neighborhood shared routes would be located mostly on residential and collector streets with low traffic volumes and speeds. They are designed to provide safe, comfortable, low-stress access within neighborhoods and for individuals of all bicycling confidence levels. Bicycle-specific infrastructure would consist of painted sharrow markings and signage to provide wayfinding. In some cases, Type III bike routes may serve as a parallel route if a Type I or II facility is not feasible on an arterial or collector roadway.

Oregon Coast Bike Route: The OCBR spans the Oregon coastline from Astoria to Brookings, primarily on US 101. It connects coastal communities, recreational destinations and viewpoints. Through Coos Bay, the OCBR is signed along Cape Arago Highway (Newmark Avenue and Empire Boulevard).

In Coos Bay, the OCBR update is looking at options to extend the route into Downtown Coos Bay via US 101 and Front Street. The City of Coos Bay supports the update of the OCBR and wishes to identify opportunities to attract riders to destinations in their community.

## Safe Routes to School

Sidewalk infill, enhanced street crossings, and dedicated bicycle facilities create safer routes between neighborhoods and schools. Improved local street connectivity shortens travel routes through neighborhoods, making walking and biking trips easier. To highlight where bicycle and pedestrian projects fall within a one-mile radius of a school, a boundary will be added to the modal plan maps in the TSP. The one-mile buffer boundary is depicted on Figure 5. ODOT has also developed an online GIS tool that allows users to access information that may support grant applications. ${ }^{2}$

[^50]
:-...: Urban Growth Boundary (UGB)

## Bicycle Route Plan

_ Future Type I (Separated)
-=- = Future Type II (Striped)

- Existing Type II (Striped)
- =- = Future Type III (Neighborhood Route)
$\longrightarrow$ Oregon Coast Bike Route


Figure 4. Coos Bay Bicycle Route Plan

Urban Growth Boundary (UGB)

L
$\downarrow$ Coos Bay Public Schools

| 0 | 0.5 | 1 |
| :---: | :---: | :---: |
| $L$ | $ـ$ |  |

Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online

## Bicycle and Pedestrian Improvements

Table 8 summarizes the bicycle and pedestrian projects that are proposed for inclusion in the TSP update. Projects with the school ( $\boldsymbol{\sim}$ ) symbol indicate the project is within a 1-mile radius of a school and may be eligible for Safe Routes to School funding.

Table 8: City of Coos Bay Preferred Alternatives - Bicycle and Pedestrian

| CB | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| PLANNED PROJECTS |  |  |  |  |  |
| 1 | Front St Blueprint | Front St | This project will be the next step to realizing components of the larger Front Street Action Plan. | ODOT | Funded |
| PEDESTRIAN |  |  |  |  |  |
| 2 | Morrison St Sidewalks | Morrison St: <br> Newmark Ave to Pacific Ave | Upgrade sidewalks on both sides | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$2.5M |
| 3 | Mingus Park Wayfinding | Mingus Park | Wayfinding signs to park | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$20k-50k |
| 4 | Newmark Ave Pedestrian Improvements | Newmark Ave: <br> Empire Blvd to Fir St | Improve PLTS score through access consolidation, median islands, midblock ped crossing | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | TBD |
| 5 | Woodland Dr Pedestrian Improvements | Woodland Dr: North City Limits to Ocean Blvd | Add sidewalks on Woodland Dr, marked ped crossing (access to Hospital/Medical Park) | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$3.2M |
| 6 | Thompson Rd Pedestrian Crossing | Thompson Road near Bay Area Hospital | Add marked crossing and mid-block crossing of Thompson Road to access hospital transit stop | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$50k |
| 7 | Hospital Way Sidewalk | Hospital Way near Medical Center (Immediate Care Clinic) | Add sidewalk to connect to medical facilities | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$560k |
| 8 | Wallace St Pedestrian Improvements | Ocean Blvd at Wallace St (Three Rivers Casino) | Construct sidewalk along Wallace St and add RRFB crossing of Ocean Blvd at Wallace St to connect to transit | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$400k |
| 9 | Coos Bay Boardwalk RR Crossing Pedestrian Improvements | Coos Bay Boardwalk (near Anderson Ave and Market Ave) | Construct at-grade multimodal improvements (pavement) to improve crossing of RR tracks. | Coos <br> Bay; <br> Coos Bay Rail | \$500k |
| 10 | US 101 Downtown Pedestrian Crossings | US 101: Commercial Ave and Alder Ave | Improved bike/pedestrian crossings across US 101 to be consistent with Front Street Action Plan | ODOT | \$100k |
| 11 | LaClair St Pedestrian Crossing | Ocean Blvd at LaClair St | Construct a pedestrian crossing with RRFB and median refuge | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$200k |
| 12 | Front Street Shared Use Path | Front St near Coos History Museum and Maritime Collection | North-south pedestrian pathway along the eastern side of Front St | City/ <br> Private | Funded |


| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. <br> Cost <br> Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 13 | Southwest Blvd Pedestrian Improvements | US 101 to south City Limits | Construct sidewalk on Southwest Blvd. Prioritize segment within Safe Routes to School boundary (California Ave to US 101) | City | \$3M |
| 14 | Connect the Boardwalks | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five mile uninterrupted boardwalk. | North <br> Bend; <br> Coos <br> Bay; <br> Private | TBD |
| BICYCLE |  |  |  |  |  |
| 15 | Ocean Blvd Road Diet (Next Phase) | Ocean Blvd | Extend road diet west from Woodland Dr to Lindy Ln | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | $\begin{gathered} \$ 115 k- \\ 300 k \end{gathered}$ |
| $\begin{aligned} & 16 \\ & ! \end{aligned}$ | Newmark Ave Road Diet | Newmark Ave: <br> Cammann St to Wallace St and Hull St to east City Limits (Fir St) | Restripe road to provide bicycle facilities (road diet) | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | $\begin{aligned} & \$ 50 \mathrm{k}- \\ & \$ 2 \mathrm{M} \end{aligned}$ |
| 17 | Woodland Dr Bicycle Facilities | Woodland Dr: North City Limits to Ocean Blvd | Add bicycle facilities (add sharrows if ROW acquisition not feasible) | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$40k |
| 18 | Newport Ln Bicycle Signage/Wayfinding | Newport Ln | Improve bicycle LTS through enhanced signage \& wayfinding to connect Coos Bay UGB | Coos <br> County | TBD |
| 19 | D St/Coos River Rd Shoulder Widening | D St/Coos River Rd: 6th Ave to East City Limits | Widen paved shoulder and provide enhanced signage \& wayfinding | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$1.1M |
| 20 | US 101 Southern Bicycle Lanes | US 101: South couplet to Coalbank Slough Bridge | Restripe to accommodate bicycle lane (options for additional signing/striping/ramp at bridge) | ODOT | \$20k-75k |
| 21 | US 101 Bicycle Facilities | US 101/Front St | Provide bicycle lanes (OCBR priority) through road widening, lane diet or parallel route(s). | ODOT | TBD |
| 22 | N 14th St Bicycle Facilities | N $14^{\text {th }}$ St: Teakwood Ave to Juniper Ave | Provide a parallel bike route to Koos Bay Blvd by providing sharrows and wayfinding on $\mathrm{N} 14^{\text {th }}$ St | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$50,000 |
| 23 | Front St Bicycle Facilities | Front St | Identify opportunities for bicycle facilities on Front St as development occurs | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | As develop ment occurs |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area
Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Public Transportation

Public transportation service within Coos County is provided by Coos County Area Transit Service District (CCAT) and is not funded directly by the City. Coos Bay can support future transit viability by designing and building streets accessible by pedestrian and bicycle modes.

## Transit Projects

The following concepts are suggested as opportunities for the City to collaborate with, or otherwise support, the CCAT in order to improve public transportation services in the Bay Area.

Table 9: City of Coos Bay Preferred Alternatives - Transit

| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. <br> Cost <br> Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| TRANSIT |  |  |  |  |  |
| 24 | Bay Area Loop Weekend Service | Bay Area Loop | Add weekend service | CCAT | N/A |
| 25 | Transit Service Hours | All Transit Routes | Extend service hours | CCAT | N/A |
| 26 | Transit Frequency | US 101 \& Ocean Blvd Routes | Increase frequency \& add additional route | CCAT | N/A |
| 27 | Shelters and Stops | All Transit Routes | Add shelters and stops near community destinations | CCAT | N/A |
| 28 | Bike/Ped Transit Connectivity | All Transit Routes | Improve bicycle and ped connectivity to stops | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | N/A |
| 29 | Regional Transit Hub | Bay Area | Support CCAT in their pursuit of regional transit hub | CCAT | N/A |
| 30 | Transit Pull Outs | Coos Bay | Work with CCAT to identify locations for transit pull outs on busier streets | CCAT | N/A |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Roadway

This section summarizes the updated functional classification plan and the preferred alternatives for streets, freight, bridges, intersections and safety improvements.

## Functional Classification Plan

CONSISTENCY WITH FEDERAL NAMING CONVENTIONS
It is important to align Coos Bay's functional classification naming conventions with federal naming conventions as it may facilitate future efforts to obtain federal funding for local improvement projects. Suggested updates to Coos Bay's classification designations are shown in Table 10. The City's previous TSP has a "Neighborhood Route" classification. The proposed classification change would differentiate between major and minor collectors.

Table 10. Proposed Functional Classification Naming Conventions

| Existing Classification Name | Proposed Classification Name |
| :---: | :---: |
| Principal Arterial (ODOT) | Principal Arterial (ODOT) |
| Minor Arterial (ODOT) | Minor Arterial (ODOT) |
| Arterial | Minor Arterial |
| Collector | Major Collector |
| Neighborhood Route | Minor Collector |
| Local | Local |

Bold indicates a proposed change in classification

## SUGGESTED FUNCTIONAL CLASSIFICATION SYSTEM

The suggested functional classification system for roadways in Coos Bay is described below. The functional classification map, Figure 6, shows the suggested classification for all roadways in the city.

General descriptions of the classifications include:
Principal Arterials are typically freeways and state highways that provide the highest level of connectivity. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterials or collectors.

Minor Arterial streets serve to interconnect and support the principal arterial highway system and are often used as a transition between Principal Arterials and Collectors. These streets link major commercial, residential, industrial and institutional areas.

Major Collector streets provide both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.

Minor Collector streets serve mostly residential or mixed land uses. While through traffic connectivity is not a typical function, they may carry limited amounts.

Local streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

Depending on the road characteristics and function, neighborhood traffic management measures may be appropriate. However, it should not be construed that these routes automatically get speed cushions or any other measures. While these treatments can be beneficial, neighborhood traffic management is only one means of retaining neighborhood character and vitality.

## SUGGESTED FUNCTIONAL CLASSIFICATION CHANGES

Table 11 summarizes the suggested changes to the existing functional classification of specific streets in Coos Bay.

Table 11. Proposed City Functional Classification Changes for Existing Streets
Koosbay Blvd: 10th St to US 101 Arterial Major Collector

Note: All streets currently classified as Collectors are proposed to become Major Collectors and all streets currently classified as Neighborhood Routes are proposed to become Minor Collectors unless otherwise noted in this table.

:----:Urban Growth Boundary (UGB)


Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT),
Oregon Geospatial Enterprise Office,
ESRI ArcGIS Online
Figure 6. Coos Bay Proposed Functional Classification Plan

## Roadway Improvements

Coos Bay's preferred alternatives for roadway are summarized in Table 12. It is important to highlight that the community has underscored the need for fixing potholes and addressing pavement condition deficiencies before capital investment in other roadway projects.

Table 12: City of Coos Bay Preferred Alternatives - Roadway

| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SAFETY CONCERN |  |  |  |  |  |
| 31 | Ocean Blvd/19 th St <br> Access Management | Ocean Blvd at $19^{\text {th }}$ St | Enhanced channelization of side street to improve safety | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | TBD |
| 32 | Thompson Ave/Woodland Dr Safety Enhancements | Thompson Ave at Woodland Dr | Restripe the east leg to remove the westbound right-turn bay and make the movement a shared thru/right to improve sight distance. | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$300k |
| 33 | Koosbay Blvd/ $10^{\text {th }}$ St <br> Realignment | Koosbay Blvd at 10th St | Realign intersection to " T " to improve visibility and safety | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | TBD |
| 34 | US 101/Kruse Ave Access Management | US 101: near Kruse Ave | Access management/channelization | ODOT | \$100k |
| 35 | S $10^{\text {th }}$ St Curb Extensions | S $10^{\text {th }}$ St: near Central Ave | Curb bump outs (consistent through downtown) | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$40k |
| 36 | Ingersoll St Curb Extensions | Ingersoll St: near S 2nd St | Curb bump outs (consistent through downtown) | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$40k |
| 37 | $7{ }^{\text {th }}$ St Curb Extensions | 7th St at Ingersoll Ave | Curb bump outs | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$40k |
| 38 | 4th Street Safety | 4th St: Market Ave to Golden Ave | Restripe to a 3-lane cross-section with sidewalk bump-outs. | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$4.8M |
| ROADWAY |  |  |  |  |  |
| 39 | Schoneman Ave Street Upgrade | Schoneman Ave: <br> Lakeshore Dr to <br> Newmark Ave | Upgrade to collector standard (storm/curb/gutter/sidewalk) and connect to trail system in John Topits Park | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$1.4M |
| 40 | Newmark Ave/Ocean Blvd Realignment | Newmark Ave at Ocean Blvd | Provide raised "porkchop" median to shorten crossing distance and provide a pedestrian crossing of Ocean Blvd. | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | TBD |
| 41 | South Coos Bay Pavement | US 101 South: Johnson Ave to Kruse Ave | Provide landscaping or pedestrian buffer to reduce large, underutilized pavement area on east side of US 101 South. | ODOT; City | \$25k |
| 42 | S Front St Street Upgrade | US 101 South: Kruse Ave to S Front St | Upgrade S Front St to its arterial standard cross-section and limit access to right-in/right out at Kruse Ave/S ${ }^{\text {st }}$ St | City | \$1-2M |
| 45 | Newmark Ave/Empire Blvd Intersection Treatment | Newmark Ave at Empire Blvd | Determine appropriate intersection treatments to improve safety and bike/ped access. | City | TBD |


| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project Name | Location | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 43 | Pavement Maintenance | City wide | Fix Potholes. <br> Maintain/fix/strengthen existing pavement system, account for maintenance in funding plan. <br> Critical: Central Ave, Southwest Blvd, Koosbay Blvd, Blanco Ave, Radar Rd, Schoneman St, LaClair St, F St, Butler Rd, Juniper Ave and Fulton Ave | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | $\begin{gathered} \$ 66 \mathrm{M} \\ (2015 \$) \end{gathered}$ |
| 44 | Newport Ln/Isthmus Slough Bridge Widening | Newport <br> Ln/Isthmus Slough Bridge | Widen structure to accommodate bicycle and pedestrians. Consider interim option to provide "bicycle warning beacons" on either side of bridge to indicate when bicyclists are present. | County; ODOT | N/A |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area
Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Safety and Operational Analysis

The projects requiring traffic operational or safety analysis are summarized below. For projects that may impact roadway or intersection capacity, traffic operations are reported for future conditions. For projects developed to specifically address a safety concern, the potential relative crash percentile reduction was determined. Table 13 summarizes the results.

Table 13. Coos Bay Safety and Operational Analysis

| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project | Traffic Operations | Crash Reduction Factor: Potential Relative Crash Reduction |
| :---: | :---: | :---: | :---: |
| BICYCLE |  |  |  |
| 15 | Ocean Blvd Road Diet (Next Phase) <br> Extend road diet west from Woodland Dr to Lindy Ln | - Turning movements were not collected for this section of Ocean Blvd. <br> - Operations are expected to meet mobility targets, similar to other Ocean Blvd road diet projects. | - Convert Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet): 29\% Effectiveness <br> - Install Continental Crosswalk Markings and Advance Pedestrian Warning Signs at Uncontrolled Locations: 15\% Effectiveness <br> - Install RRFB without Median: 10\% Effectiveness |


| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project | Traffic Operations | Crash Reduction Factor: Potential Relative Crash Reduction |
| :---: | :---: | :---: | :---: |
| 16 | Newmark Ave Road Diet <br> Restripe road to provide bicycle facilities (road diet) on Newmark Ave from Ackerman Ave to Cammann St | - No Build: TSP intersections meet mobility targets, with the exception of the SB movements at Morrison St <br> - With Project: TSP intersections meet mobility targets, with the exception of the SB movements at Morrison St | - Convert Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet): 29\% Effectiveness |
| SAFETY CONCERN |  |  |  |
| 31 | Ocean Blvd/19 ${ }^{\text {th }}$ St Access Management <br> Enhanced channelization of side street to improve safety by limiting turns onto 19th St from Ocean Blvd | - Turning movements were not collected for this intersection. <br> - Operations expected to improve at 19th St <br> - Volumes expected to shift to Woodland Dr/Ocean Blvd | - CRF not available |
| 32 | Thompson Ave/Woodland Dr Safety Enhancements Restripe the east leg to remove the westbound right-turn bay and make the movement a shared thru/right to improve sight distance. | - No Build: Intersection meets mobility targets <br> - With Project: Intersection meets mobility targets | - Increase Triangle Sight Distance: 11-56\% Effectiveness |
| 33 | Koosbay Blvd/10 ${ }^{\text {th }}$ St <br> Realignment <br> Realign intersection to " T " to improve visibility and safety | Project not expected to significantly impact roadway or intersection capacity | - Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs: 37\% Effectiveness <br> - Increase Triangle Sight Distance: 11-56\% Effectiveness <br> - Reduce Intersection Skew Angle (Minor Street StopControlled Intersections Only) on 3-Leg intersection (Highway Safety manual - no CRF available) |


| $\begin{aligned} & \text { CB } \\ & \text { ID } \end{aligned}$ | Project | Traffic Operations | Crash Reduction Factor: Potential Relative Crash Reduction |
| :---: | :---: | :---: | :---: |
| 34 | US 101/Kruse Ave Access Management Upgrade S Front St to its arterial standard crosssection and limit access to right-in/right out at Kruse Ave/S ${ }^{\text {st }}$ St | - Turning movements were not collected for this intersection. <br> - Project not expected to significantly impact roadway or intersection capacity | - Install right-inOright-out operations at stop-controlled intersections: 45\% Effectiveness |
| $\begin{gathered} 35- \\ 37 \end{gathered}$ | Curb Extensions <br> - S 10th St Curb Extensions <br> - Ingersoll St Curb Extensions <br> - 7th St Curb Extensions <br> - 4th St Curb Extensions | Project not expected to significantly impact roadway or intersection capacity | - Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs: 37\% Effectiveness <br> - Install speed humps: 50\% Effectiveness |
| ROADWAY |  |  |  |
| 40 | Newmark Ave/Ocean Blvd Realignment Reconfigure turn lanes to increase safety and decrease pedestrian crossing distance. | - No Build: Intersection meets mobility targets <br> - With Project: Intersection meets mobility targets | - Channelized Right Turn Lane with Raised Median: 25\%-50\% |

Notes: Detailed traffic operations are located in the Appendix

## Air, Water, Rail and Pipeline

The following describes identified needs and improvements related to the air, water, rail, and pipeline modes. The majority of the projects in this section are opportunities for the City to collaborate with, or otherwise support, the lead agency.

## Air, Water, Rail and Pipeline Improvements

Table 14: City of Coos Bay Preferred Alternatives - Other

| $\begin{aligned} & \text { CB } \\ & \text { ID } \\ & \hline \end{aligned}$ | Location |  | Description | Primary <br> Funding <br> Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| RAIL/TRUCK FREIGHT |  |  |  |  |  |
| 46 | Market Ave/Front St RR Crossing Upgrade | Market Ave at Front St | Install at-grade rail active warning device | $\begin{gathered} \text { Coos } \\ \text { Bay Rail } \end{gathered}$ | See Project 9 |
| 47 | Central Dock Rd RR Crossing Upgrade | US 101 at US plywood-Central Dock Rd | Install at-grade rail active warning device | Coos <br> Bay Rail | \$500k |
| 48 | US 101/Curtis Ave Signal Head Upgrade | US 101 at Curtis Ave | Address Highway Over-Dimension Load Pinch Point by raising signal head | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | $\begin{gathered} \$ 50 \mathrm{k}- \\ 100 \mathrm{k} \end{gathered}$ |
| 49 | US 101/Koosbay Blvd Upgrades | US 101 at Koosbay Blvd | Make modifications to accommodate high heavy vehicle volumes per OFP | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | TBD |


| CBID Location |  |  | Description | Primary Funding Source | Prelim. Cost Estimate (2019 \$) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 50 | US 101/Commercial Ave Upgrades | US 101 South at Commercial Ave | Make modifications to accommodate high heavy vehicle volumes per OFP | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | TBD |
| 51 | US 101 <br> North/Johnson Ave Upgrades | US 101 North at Johnson Ave | Make modifications to accommodate high heavy vehicle volumes per OFP | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | TBD |
| MARINE/AIRPORT |  |  |  |  |  |
| 52 | Marine Ways Enhancements | Charleston boatyard | Improvements that include the Marine Ways | POCB | N/A |
| 53 | North Spit Improvements | Oregon Gateway | North Spit improvements to accommodate a multi-modal marine facility to handle bulk cargo, containers and an LNG export facility | POCB | N/A |
| 54 | Channel Widening/Deepening | Coos Bay | Federal channel widening and deepening to accommodate larger ships and ensure safer operations | POCB | N/A |
| 55 | Charleston Boatyard Dock Replacements | Charleston boatyard | Dock replacements | POCB | N/A |
| 56 | Expanded Passenger Service | Airport | Add direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland) | CCAD | N/A |
| 57 | Airport Transit Service | Airport | Provide transit service to airport if air passenger service increases | CCAT | N/A |

Notes:

1. Cost estimates are provided for draft alternatives with defined scope/extents. Cost Estimates do not include right-of-way, utility relocation, new utilities or hazmat costs.
2. Cost estimates were not prepared for projects where the scope/extents are undefined (TBD) or included in another adopted plan (N/A).
ODOT = Oregon Department of Transportation; OCBR = Oregon Coast Bike Route; CCAT = Coos County Area
Transit; OFP = Oregon Freight Plan; POCB = Port of Coos Bay; CCAD = Coos County Airport District

## Preferred Project Maps

The project locations for North Bend and Coos Bay are summarized in Figure 7 and Figure 8, respectively. City wide projects such as pavement maintenance and transit service enhancements are not displayed as their location is not fixed.

## North Bend TSP


-----. Urban Growth
:-.... Boundary (UGB)

-     - Schools 1-mile
- I Boundary
- Coos Bay Public
- Schools
$\square$ Post OfficeCity Hall

Projects (by primary mode)
Spot Locations (D) Segments ID \#

- Pedestrian Pedestrian
- Transit - Bicycle
- Roadway - Roadway
- Rail/Truck Freight - Rail/Truck Freight
- Safety - Safety
- Marine/Airport

Data Sources:
Cities of North Bend and Coos Bay,
Oregon Department of Transportation (ODOT), Oregon Geospatial Enterprise Office,
ESRI ArcG/S Online


## Project Sheets

Project sheets were developed for several of the preferred alternatives to highlight important features of the project area and to serve as a resource for future project development. The project sheets include a description of the proposed project and possible options and considerations for design elements. Not all of the preferred alternatives have a project sheet; they were created for projects that benefit from additional details or figures.

The images provided in this document are conceptual and for planning purposes only. Should a project be selected by the City or ODOT to be pursued further, the design features and cost estimates will be refined through the engineering process.

|  |  |  |
| :---: | :---: | :---: |
| Purpose | - Provide safe pedestrian connection from Simpson <br> - Modernize to local road standard. | eights neighborhood to downtown North Bend. |
| Description | Add sidewalks on Sheridan Avenue between Florid crossing to provide activated crossing of existing | venue and Bayview Avenue and upgrade RR ve at grade crossing. |
| Location | Sheridan Ave: Florida Ave to Bayview Ave |  |
| Roadway Characteristics | - Local road <br> - Pavement Width: 20-24' <br> - Lanes: 2 <br> - No curb, gutter or sidewalk. <br> - Posted speed: 25 mph <br> - At-grade rail crossing (cross bucks and stop signs) <br> - Existing (2018) ADT: <500 veh/day <br> - Forecast (2040) ADT: <500 veh/day | 5-Year Crash History (2012-2016): <br> - No reported crashes |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Lacks pedestrian facilities <br> - Lacks bicycle facilities <br> - Rail traffic is expected to increase <br> - Substandard roadway width for local street classification | With Improvement <br> - Pedestrian facilities from new sidewalks <br> - Widened roadway could provide for more comfortable shared travel between bicycles and pedestrians <br> - Active warning signs could improve safety |
| Additional Considerations | - Road Authority: City of North Bend <br> - This is a public rail crossing and will need to be coord <br> - Environmental constraints: None <br> - Sheridan Avenue is part of the route for North Bend <br> - Design features: Could consider providing sharrow | ordinated with ODOT Rail <br> d's annual July Jubilee Jaunt $5 k$ fun run. s on Sheridan to provide route for bicycles |
| Cost Opinion | Cost: $\$ 1.4$ million (includes cost for upgraded rail crosin Cost opinion is in 2019 dollars and does not assume costs. | ssing) <br> right-of-way, utility relocation, new utilities or hazmat |
| Implementation | - Could be triggered with a pavement maintenance <br> - Medium priority due to low traffic volumes and se | project <br> asonal pedestrian use |


|  |  |
| :--- | :--- | :--- |


|  | COLORADO AVE |
| :--- | :--- | :--- |



| Purpose | - Improves comfort of the pedestrian network <br> - Addresses curb ramp deficiencies <br> - Provides enhanced road crossing/visibility near school |
| :---: | :---: |
| Description | Provide a sidewalk on west side of Pacific Avenue and upgrade pedestrian crossing visibility and curb ramps at the intersections. |
| Location | Pacific Ave: Crowell Ln to 16th St |
| Roadway Characteristics | - Pacific Ave: Major Collector <br> - Lanes: 2 <br> - Pavement Width: $33^{\prime}$ <br> - Sidewalk on east side only <br> - Posted speed: 20 mph (school zone) <br> - Existing (2018) ADT: 1,000-1,500 veh/day <br> - Forecast (2040) ADT: 1,000-1,500 veh/day <br> 5-Year Crash History (2012-2016): <br> - 2 crashes along Pacific Ave <br> - Intersections do not exceed critical crash rate or 90th percentile crash rate |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Sidewalks on one side only and substandard ADA ramps adjacent to school <br> - Lacks bicycle facilities <br> - Substandard roadway cross-section for Major Collector street classification <br> With Improvement <br> - Pedestrian facilities from new sidewalks <br> - Enhanced crossing safety and visibility |
| Additional Considerations | - Road Authority: City of North Bend <br> - Environmental constraints: None <br> - If desired to upgrade to roadway cross-section standard, property impacts would be needed to meet ROW requirements of a Major Collector (current code dictates 50' minimum street width). Concept does not consider widening roadway. <br> - Design features: Signing and striping should be done simultaneously. Sidewalk improvements can be a secondary phase if desired. <br> - If used, the In-Street Pedestrian Crossing sign shall be placed in the roadway at the crosswalk location, the center line, on a lane line, or on a median island. The In-Street Pedestrian Crossing Sign shall not be post-mounted on the left-hand or right-hand side of the roadway. |
| Cost Opinion | Cost: $\$ 730,000$ (includes cost for ADA ramp improvements) Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |
| Implementation | - Striping could be paired with a pavement maintenance project <br> - Signing, striping and ramps a high priority, sidewalk infill is medium priority since sidewalk already exists on one side of the street |


| NB-5 <br> Virginia Ave Access Consolidation |
| :--- |


| NB-6 <br> Virginia Ave | strian Crossing | North Bend <br> Transportation System Plan |
| :---: | :---: | :---: |
|  |  |  |
| Purpose | - Improves comfort of the pedestrian network <br> - Addresses curb ramp deficiencies <br> - Provides formal pedestrian crossing of Virginia Ave between Broadway Ave and Pony Village |  |
| Descri | Provide a pedestrian crossing between Broadway Ave and Pony Creek Village. |  |
| Location | Virginia Ave (OR 540): US 101 southbound to Broadway Ave (MP 0 - MP 0.77) |  |
| Roadway Characteristics | - Principal Arterial/District Highway <br> - Lanes: 4-5 <br> - Pavement Width: 50'-60' <br> - Posted speed: 25-30 mph <br> - Lacking dedicated bicycle facilities, limited protected pedestrian crossing opportunities <br> - Existing sidewalk, curb and gutter <br> - Existing (2018) ADT: 10,000-15,000 veh/day <br> - Forecast (2040) ADT: 18,000-20,000 veh/day | 5-Year Crash History (2012-2016): <br> - Of the nearly 150 crashes reported on this segment of Virginia Ave, three were pedestrian related |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Substandard ADA ramps <br> - Several driveways/accesses <br> - Lacks bicycle facilities <br> - Existing pedestrian crossing at Marion Ave is not an ODOT approved crossing. | - Improved pedestrian level of traffic stress <br> - Enhanced crossing safety and visibility |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints: None <br> - Airport overlay zone <br> - Project should maintain westbound left-turn onto Marion Ave from Virginia Ave. <br> - Design features: Consider emergency vehicle access, limit impacts to business access. Consider continental striping of crosswalks for higher visibility. Need a median refuge. Volumes do not warrant a HAWK signal. |  |
| Cost Opinion | Cost: TBD with design refinement |  |
| Implementation | - Could be paired with a pavement maintenance project <br> - Pedestrian crossing is a priority west of Pony Village since current crossing at Marion Ave is unapproved. <br> - Project could be paired with ADA ramp work. <br> - Other ways to improve ped level of stress: Tighten curb and add continental striping of Marion Ave <br> - Pedestrian crossing on ODOT facilities requires ODOT engineering approval |  |


|  |  | Access Consolidation a | Non-traversable Median <br> Design Guide (Figure I-9) | Turn Restrictions <br> Mutcd.fhwa.dot.gov |
| :---: | :---: | :---: | :---: | :---: |
| Purpose | - Move toward access sp <br> - Consolidate multiple ful <br> - Decrease vehicular conflic <br> - Narrow up feeling of Ne | ing goals access points t points (safety conce mark Ave |  |  |
| Description | Provide access manageme installing a non-traversable left-in access to property on | t measures on Newm median. Considering south side of Newm | Ave between Broadw taining a full movem Ave. | nd Cedar St by ss or right-in, right-out, |
| Location | Newmark Ave (OR 540): Bro | adway Ave to Cedar | M.P. 1.81 to 1.99) |  |
| Roadway Characteristics | - Principal arterial/ODOT D <br> - Lanes: 5 <br> - Pavement Width: $64^{\prime}$ <br> - Sidewalk on east side only <br> - Posted speed: $30-35 \mathrm{mph}$ <br> - Existing (2018) ADT: 15,000 <br> - Forecast (2040) ADT: 20,0 | istrict Highway <br> 00-20,000 veh/day <br> 000-25,000 veh/day | 5-Year Crash History (20 <br> - 49 crashes along New mostly turning related <br> - Broadway Ave at New critical crash rate and (1.12 creash/mev) <br> - One fatality just west | 2016): <br> rk Ave in this section, <br> rk Ave/St exceeds th percentile crash rate <br> ocation near Oak St |
| How <br> Improvement Addresses Deficiencies | Existing/Future Deficiency <br> - Doesn't meet access spac <br> - Trend in turning related co | ing recommendations ollisions | With Improvement <br> - Reduced conflict poin <br> - Anticipated reduction | urning collisions |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints <br> - A STIP project is planned Ave and includes some m <br> - Design needs to maintain <br> - Consider impacts to Broad | s: None <br> for the intersection of inor access manageme some access to busine dway Ave if traffic is di | wmark Ave at Broadway measures. <br> s. <br> ted to the existing drivew | e that impacts Newmark <br> y there. |
| Cost Opinion | Cost: \$175000 <br> Cost opinion is in 2019 dolla costs. | rs and does not assum | ight-of-way, utility reloca | n, new utilities or hazmat |
| Implementation | - Could consider implemen <br> - Need to conduct pedestri <br> - Potential crossing at Ceda <br> - High priority | ting with STIP project p an access study with th St. | ned in vicinity. <br> ddition of a non-travers | median. |



| AIRPORT |
| :--- | :--- |


PARK




| Purpose |  |  |
| :---: | :---: | :---: |
|  |  |  |
|  | Provide designated bicycle facilities on the Oregon Coast Bike Route (OCBR) on Broadway Avenue |  |
| Description | Repurpose the available pavement to add bicycle lanes with a striped buffer between vehicular travel and bicycle travel. |  |
| Location | Broadway Ave (OR 540): Virginia Ave to Newmark Ave (MP 0.77-MP 1.81) |  |
| Roadway Characteristics | - Principal Arterial/District Highway <br> - Lanes: 4-5 <br> - Pavement Width: 60' <br> - Posted speed: 35 mph <br> - Lacking dedicated bicycle facilities <br> - Existing sidewalk, curb and gutter <br> - Existing (2018) ADT: 10,000-20,000 veh/day <br> - Forecast (2040) ADT: 15,000-25,000 veh/day | 5-Year Crash History (2012-2016): <br> - Of the nearly 100 crashes reported on this segment of Broadway Ave, four of them were pedestrian related |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Broadway Ave is part of the OCBR and does not have separated bicycle facilities <br> - Sidewalk is not adequate to share with pedestrians | With Improvement <br> - Widens center turn lane <br> - Provides buffered bicycle lanes on the OCBR on Broadway Ave <br> - Improves pedestrian comfort by providing a buffer between vehicular traffic |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints: None <br> - Could have property or driveway impacts <br> - Will likely lower vehicular speeds due to reduced vehicular capacity <br> - Could be part of a large OR 540 corridor study to evaluate multimodal improvements. <br> - An alternate or intermediate option would be to provide a parallel route to Broadway Avenue by striping sharrows and providing wayfinding along Oak St, $16^{\text {th }} / 17^{\text {th }}$, Myrtle St, Commercial St. |  |
| Cost Opinion | Cost: Cost opinion not developed as part of the TSP. |  |
| Implementation | - Medium priority <br> - This effort would be led by ODOT |  |



| Purpose | Provide designated bicycle facilities on the Oregon Coast Bike Route (OCBR) on Newmark Avenue |
| :--- | :--- | :--- |
| Description | Provide a parallel route to Newmark Ave with sharrows and wayfinding on local system. |


|  |  | Potential Cross Sections <br> Made with Streetmix <br> Made with Streetmix <br> Made with Streetmix |
| :---: | :---: | :---: |
| Purpose | - Provide bicycle facilities on a Major Collector <br> - Bring roadway closer to cross-section standard |  |
| Description | Repurpose the available pavement to add bicycle done within the existing pavement width by restr | to Maple Leaf/Colorado Avenue. This could be to $11-12^{\prime}$ travel lanes and $6^{\prime}$ bike lanes. |
| Location | Maple St/Colorado Ave: Virginia Ave to Arthur St |  |
| Roadway Characteristics | - Major Collector <br> - Lanes: 2 <br> - Pavement Width: 42 ', poor pavement <br> - Posted speed: 25 mph <br> - Varied on-street parking <br> - Lacking dedicated bicycle facilities <br> - Existing sidewalk (varies), curb and gutter <br> - Existing (2018) ADT: $<1,000$ veh/day <br> - Forecast (2040) ADT: <1,000 veh/day | 5-Year Crash History (2012-2016): <br> - 5 total crashes on this segment of Maple/Colorado Ave |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Poor pavement condition <br> - Lacking dedicated bicycle facilities to NW North Bend <br> - Lacking multimodal options to access the airport | With Improvement <br> - Addresses pavement condition if paired with pavement preservation <br> - Provides high quality dedicated bicycle facilities |
| Additional Considerations | - Road Authority: North Bend <br> - Environmental considerations: None <br> - Three options: <br> - Option A: Parking on one side with striped bicycle <br> - Option B: No Parking and buffered bike lanes on eac <br> - Option C: No parking and a two-way cycle track on low on this road with limited thru traffic/turns. | facilities on each side <br> ach side <br> one side of street - Not preferred as volumes are |
| Cost Opinion | Cost: $\$ 1.6$ million (assumes complete repaving proje Cost opinion is in 2019 dollars and does not assume costs. | ct) <br> right-of-way, utility relocation, new utilities or hazmat |
| Implementation | - Medium priority <br> - Triggered with pavement maintenance project |  |




| Bulb Outs |  |
| :--- | :--- |
| Purpose | $\bullet$ Neighborhood traffic calming (slow speeds) |
| $\bullet$ - Minimize cut-through traffic on Meade Avenue and Connecticut Avenue |  |


|  | Potential Crosswalk Treatment and Signing |
| :---: | :---: |
| Purpose | - Improves comfort of the pedestrian network <br> - Addresses curb ramp deficiencies <br> - Provides enhanced road crossing/visibility across US 101 |
| Description | Upgrade pedestrian crossing visibility and curb ramps across US 101 southbound at Washington Ave/Sherman Avenue. |
| Location | US 101 South and Washington Ave/Sherman Ave |
| Roadway Characteristics | - Functional Classification: <br> - Lanes: 3 <br> - Pavement Width: 48'-60' <br> - Posted speed: 20 mph <br> - Existing (2018) ADT: 9,800 veh/day <br> - Forecast (2040) ADT: 10,600 veh/day <br> 5-Year Crash History (2012-2016): <br> - 16 crashes <br> - Exceeds statewide 90th percentile crash rate. <br> - There is no distinct pattern in collision type; however, most were due to not yielding the right-of-way or disregarding a stop sign. |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Non-standard intersection <br> - Long pedestrian crossing distance <br> - High traffic volumes <br> - Uncomfortable for pedestrians <br> - Limited visibility of crossing <br> - Closest formal crossing of US 101 to the south is over a mile away <br> With Improvement <br> - Enhanced crossing safety and visibility <br> - Improved pedestrian comfort |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints: Near leaking underground storage tank but this is not expected to impact improvement <br> - Project can be constructed within available right of way <br> - Overhead signage not feasible <br> - Need to maintain "hole in the air" for freight movement along US 101 |
| Cost Opinion | Cost: \$5,000-\$30,000 <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |
| Implementation | - Striping could be paired with a pavement maintenance project <br> - Signing, striping and ramps a medium priority |



Proposed Improvement


| Purpose | - Improves comfort of the pedestrian network <br> - Addresses curb ramp deficiencies <br> - Traffic calming along Pony Creek Estuary |  |
| :---: | :---: | :---: |
| Description | Tighten radius of western curbs, provide pavement markings, formalize striping on Pony Creek Rd and consider all-way stop control. |  |
| Location | Pony Creek Rd at Crowell Ln |  |
| Roadway Characteristics | - Functional classification: Major Collector <br> - Lanes: 2 <br> - Pavement Width: <br> - Pony Creek St: 30'-32' <br> - Crowell Ln: 30' <br> - Posted speed: 20-25 mph <br> - Existing (2018) ADT: <3,500 veh/day <br> - Forecast (2040) ADT: <3,500 veh/day <br> - Crowell lane is currently STOP-controlled | 5-Year Crash History (2012-2016): <br> - Just exceeds statewide 90th percentile crash rate. <br> - Three crashes reported at this low volume intersection <br> - All three crashes occurred during low light/dark conditions and were due to improper driving (speeding or failing to yield right-of-way). |
| How Improvement Addresses Deficiencies | Existing/Future Deficiency <br> - Wide pedestrian crossing distance of Crowell Ln <br> - Pony Creek Rd is free flowing and has limited sight distance due to adjacent slope and vegetation | With Improvement <br> - Anticipated reduction in turning collisions <br> - Narrower pedestrian crossing <br> - Traffic calming on Pony Creek Rd <br> - Traffic operations expected to operate within City standards as 2-way OR all-way STOP control |
| Additional Considerations | - Road Authority: North Bend <br> - Environmental constraints: Near Pony Creek and within 100-year flood zone <br> - Structure crossing Pony Creek is on the west leg could influence design treatments <br> - Project can be constructed within available right of way <br> - Enhanced lighting, signing and striping should be considered to increase visibility of intersection <br> - Design should consider existing residential driveway on east side of Pony Creek Rd |  |
| Cost Opinion | Cost: \$50,000 <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | High priority |  |


| CB-2 Coos Bay  <br> Morrison Street Sidewalks Transportation System Plan |  |  |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |
| Purpose | - Construct sidewalk to enhance pedestrian connectivity <br> - Provide parallel connection to Middle School and Elementary school one block west <br> - Provide sidewalks on a Collector street |  |
| Description | Construct sidewalk on both sides of Morrison Street to provide a north-south spine that connects the east-west sidewalk system. |  |
| Location | Morrison St: Newmark Ave to Pacific Ave |  |
| Roadway Characteristics | - Functional Classification: Major Collector <br> - Lanes: 2 <br> - Pavement Width: 36' <br> - Posted speed: 25 mph <br> - Existing (2018) ADT: 3,500-5,000 veh/day <br> - Forecast (2040) ADT: 3,500-5,000 veh/day | 5-Year Crash History (2012-2016): <br> - Intersections do not exceed critical crash rate or 90th percentile crash rate <br> - There were 9 reported crashes on Morrison St within this segment |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Lacks pedestrian facilities <br> - Lacks bicycle facilities <br> - Substandard roadway cross-section for Local and Major Collector street classification | With Improvement <br> - Pedestrian facilities from new sidewalks <br> - Separates pedestrians from vehicular traffic <br> - Improved pedestrian connections to schools |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: Leaking Underground Storage Tank at north end of road <br> - This is within a mile radius of a school and could be eligible for Safe Routes to School funding <br> - If reconstructing the road, should consider upgrading to Collector standard <br> - Improvement will impact existing residential frontage and driveways |  |
| Cost Opinion | Cost: \$2.5M <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - Medium priority |  |


| CB-3 <br> Mingus Park | ayfinding | Coos Bay Transportation System Plan |
| :---: | :---: | :---: |
|  |  |  |
| Purpose | Enhance pedestrian and bicycle awareness and connectivity to Coos Bay park system |  |
| Descriptio | Wayfinding signs to Mingus Park |  |
| Location | Mingus Park and surrounding local streets |  |
| Roadway Characteristics | - Varies: <br> - Ocean Blvd: Minor Arterial (3 lane) <br> - 10th St: Minor Arterial (2 lane) <br> - Hemlock Ave: Major Collector (2 lane) | 5-Year Crash History (2012-2016): <br> - Koosbay Blvd at 10th St exceeds critical crash rate and 90th percentile crash rate |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Few signs exist to direct visitors or new residents to local park/trail system <br> - Lack of dedicated bicycle lanes and routes <br> - Coos Bay lacks signage from the OCBR to community features | With Improvement <br> - Potential for bicycle facilities through striping sharrows along with wayfinding <br> - Enhances connectivity of bicycle and pedestrian system <br> - Potential safety benefits from directing users to correct routes |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental considerations: Mingus Park has a freshwater pond and is near a historic landslide location. There are several leaking underground storage tanks surrounding Mingus Park, however this should not be impacted by this improvement. <br> - Available ROW: Signs and striping can be placed within the public ROW <br> - Located within a 1-mile radius of a school <br> - Consider providing estimated time to get to destination on the wayfinding sign <br> - Coordination with Coos Bay Parks and Recreation <br> - Does not require new pavement or reconstruction to provide wayfinding <br> - Consider sign placement along transit routes |  |
| Cost Opinion | Cost: \$20,000 - \$50,000 <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - High priority <br> - Project could be coordinated with "N 14th St Bicycle Facilities" and other wayfinding and neighborhood bicycle routes |  |




|  |  | nt and Signing |
| :---: | :---: | :---: |
| Purpose | - Provide pedestrian connectivity to Hospital <br> - Provide a marked crossing to enhance pedestrian access to transit stop at Hospital |  |
| Description | Add marked mid-block crossing of Thompson Road to access hospital transit stop. |  |
| Location | Thompson Rd near Bay Area Hospital driveways |  |
| Roadway Characteristics | - Functional Classification: Major Collector <br> - Lanes: 2-3 <br> - Pavement Width: 36' <br> - Sidewalk, curb, gutter <br> - $14^{\prime}$ travel lanes <br> - Posted speed: 30 mph <br> - Existing (2018) ADT: <5,000 veh/day <br> - Forecast (2040) ADT: 5,000 veh/day | 5-Year Crash History (2012-2016): <br> - Thompson Rd at Woodland Dr exceeds critical crash rate and 90th percentile crash rate <br> - There were 4 reported collisions on Thompson Rd between Pacific St and 16th St |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - No marked crossing of Thompson Rd near Hospital and Hospital transit stop <br> - Pedestrian connectivity to Medical Park | With Improvement <br> - North-south pedestrian connectivity <br> - Improved access to transit |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: None <br> - There is enough space in the median to provide a center island pedestrian refuge if desired. <br> - Location of crossing should not conflict with turn bays. <br> - Designs would need to be coordinated with existing driveway locations <br> - No ROW impacts |  |
| Cost Opinion | Cost: \$50,000 <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - High priority |  |


|  |  |  |
| :---: | :---: | :---: |
| Purpose | This project would provide facilities for pedestrians and work toward establishing Hospital Way as a route with a pedestrian level of traffic stress score of 2 or better, a recommended target for access to medical centers |  |
| Description | Add sidewalk to north side of Hospital Way to connect to medical facilities. |  |
| Location | Hospital Way near Medical Center (Immediate Care Clinic) |  |
| Roadway Characteristics | - Functional Classification: Local <br> - Lanes: 2 <br> - No sidewalk, curb, gutter <br> - No bicycle facilities <br> - Pavement Width: 28'-30' <br> - Posted speed: 20 mph <br> - Existing (2018) ADT: 500-1,000 veh/day <br> - Forecast (2040) ADT: 500-1,000 veh/day | Pedestrians traveling on Hospital Way must walk on roadway where there is limited to no shoulder. <br> 5-Year Crash History (2012-2016): <br> - No crashes reported on Hospital Way |
| How Improvement Addresses Deficiencies | Existing/Future Deficiency <br> - Limited to non-existent pedestrian facilities/connectivity on Hospital Way <br> - Lacks bicycle facilities <br> - No shoulder on bridge | With Improvement <br> - East-west pedestrian connectivity <br> - Increased connectivity to Medical Park <br> - Increased safety <br> - Enhanced pedestrian environment |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: Crosses stream with wetland potential <br> - Available ROW: Existing structure and guardrail limit ability to easily provide pedestrian connectivity on Hospital Way <br> - Could consider a multi-use path as an alternative, but the slope/grade are not pedestrian-friendly <br> - Additional ROW or easements appear needed to accommodate sidewalks <br> - Some property impacts (including parking lots) to add sidewalks but no building impacts anticipated <br> - Additional storm water treatment needed with increased impervious surface |  |
| Cost Opinion | Cost: \$560k <br> Cost opinion is in 2019 dollars and does no costs. | right-of-way, utility relocation, new utilities or hazmat |
| Implementation | - Medium priority; short section gives limit | ctivity/access. |



|  |  | Potential <br> Pedestrian RR Crossing Treatment |
| :---: | :---: | :---: |
| Purpose | - At-grade RR crossing safety <br> - Pedestrian connectivity to community features (boardwalk) |  |
| Desc | Construct at-grade multimodal improvements across the RR near the Coos Bay boardwalk. |  |
| Location | RR crossing to Coos Bay Boardwalk (near Anderson Ave and Market Ave) |  |
| Roadway Characteristics | The RR travels down the center of Front Street. | There have been no recorded pedestrian fatalities by the Coos Bay Rail within Coos Bay. |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Access to the Boardwalk has several uncontrolled crossings and limited active warning signals for vehicles and pedestrians. Rail traffic is expected to increase in the future. <br> - There are multiple tracks to cross | With Improvement <br> Could improve safety with new signing, pavement paint, and/or activated pedestrian gates at the RR crossings. |
| Additional Considerations | - Road Authority: Coos Bay; Coos Bay Rail <br> - Environmental constraints: 100 year floodplain <br> - Available ROW: City has right-of-way along Front Street <br> - Pedestrian gates could separate pedestrians from rail traffic and discourage them from crossing the tracks except at designated locations or when there is no anticipated rail <br> - Activated warning devices should be considered to indicate when trains are approaching <br> - At-grade crossings with multiple tracks can present additional dangers to pedestrians and separate warnings may be necessary for these locations to help alert pedestrians of the full extent of the danger of the at-grade rail crossing. |  |
| Cost Opinion | Cost: Up to $\$ 500,000$ per crossing, depending on treatment selected Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - High priority <br> - Coordinate with Front Street Traffic Safety Plan <br> - Coordinate with ODOT Rail and Coos Bay Rail <br> - Any new pedestrian crossing of an ODOT facility will require ODOT engineering approval. |  |


|  |  |  |
| :---: | :---: | :---: |
| Purpose | - Increase pedestrian and bicycle network connectivity and safety across US 101. |  |
| Description | Improved bike/pedestrian crossings across US 101 to be consistent with Front Street Action Plan |  |
| Location | US 101 at Commercial Ave and Alder Ave |  |
| Roadway Characteristics | - Functional Classification: Principal Arterial <br> - Lanes: 2 <br> - Pavement Width: $40^{\prime}-50^{\prime}$ <br> - Travel lanes are >20' <br> - Posted speed: 25-30 mph <br> - Existing (2018) ADT: 10,000-15,000 veh/day <br> - Forecast (2040) ADT: 10,000-15,000 veh/day <br> - There are no striped bicycle lanes | 5-Year Crash History (2012-2016): <br> - No crash data trends at either intersection. |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Limited marked crossing of US 101 northbound to connect to north end of Front St <br> - Limited bicycle/pedestrian connectivity across US 101 | With Improvement <br> - Increased east-west pedestrian connectivity <br> - Improved access to community features <br> - Pedestrian crossing of US 101 North |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints: 100 year flood plain <br> - Available ROW: Project can be constructed within the available ROW <br> - Consider striping or candlesticks to "narrow up" the feeling of the cross-section without limiting freight movement <br> - Must maintain "hole in the air" as US 101 is a freight route |  |
| Cost Opinion | Cost: \$100,000 <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - High priority <br> - Any pedestrian crossing of US 101 would require State engineering approval. <br> - Coordinate with Front Street Blueprint Plan (a crossing at US 101 northbound at Alder Ave can be studied under the context of the upcoming Front Street Blueprint. |  |




| CB-15 <br> Ocean Blvd F | Diet (Final Phase) | Coos Bay Transportation System Plan |
| :---: | :---: | :---: |
|  |  |  |
| Purpose | - Provide a continuous bicycle facility connection along Ocean Blvd <br> - Provide multimodal connectivity between Newmark Ave and Downtown Coos Bay <br> - Improve safety <br> - Slow vehicular speeds |  |
| Description | Complete the Ocean Blvd pavement reallocation ("road diet") project. Repurpose two vehicular travel lanes for bicycle lanes. |  |
| Location | Ocean Blvd: Woodland Dr to Lindy Ln |  |
| Roadway Characteristics | - Ocean Blvd: Arterial <br> - Lanes: 5 <br> - Sidewalks <br> - Pavement Width: 54'-56' <br> - Posted speed: 40 mph <br> - Existing (2018) ADT: 10,000-15,000 veh/day <br> - Forecast (2040) ADT: 10,000-15,000 veh/day | 5-Year Crash History (2012-2016): <br> - Approximately 65 crashes reported on Ocean Blvd within this segment <br> - One fatality near Woodland Dr |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Bicycle connectivity <br> - Bicycle facilities on Arterials <br> - Safety | With Improvement <br> - Completes bicycle lanes on Ocean Blvd <br> - Provides a multi-modal facility <br> - Safety benefits |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: None <br> - This project could be coordinated with the proposed pedestrian crossings of Ocean Blvd <br> - No change in roadway surface <br> - Preferred striping would limit wide areas of bare pavement in order to "narrow up" roadway <br> - Preferred to restripe with paving project to avoid stripe removal lines <br> - No impacts to adjacent properties |  |
| Cost Opinion | Cost: \$115,00 - \$300,000 <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - Medium priority <br> - Could be implemented in tandem with Ocean Blvd pedestrian crossing projects |  |


| CB-16 <br> Newmark Ave | Road Diet | Coos Bay <br> Transportation System Plan |
| :---: | :---: | :---: |
|  |  |  |
| Purpose | - Reallocate street space to create a more balanced facility that accommodates vehicles, bicycles and pedestrians |  |
| Description | Restripe road to provide bicycle facilities (road diet) |  |
| Location | Cammann St to Wallace St and Hull St to east City Limits (Fir St) |  |
| Roadway Characteristics | - Functional Classification: Arterial <br> - Lanes: 5 <br> - Pavement Width: 46'-66' <br> - Posted speed: 30-35 mph <br> - Existing (2018) ADT: 7,500-10,000 veh/day <br> - Forecast (2040) ADT: 7,500-10,000 veh/day | 5-Year Crash History (2012-2016): <br> - Intersections do not exceed critical crash rate or 90th percentile crash rate <br> - 9 reported crashes at Morrison St intersection <br> - 17 reported crashes at Ocean Blvd intersection |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Level of traffic stress of 4 (highest) for both cyclists and pedestrians, indicating a high-stress environment <br> - Lacks bicycle facilities <br> - Narrow sidewalks directly adjacent vehicular traffic | With Improvement <br> - Striped bicycle lanes <br> - Provides buffer for pedestrians from vehicular traffic <br> - Increases safety for cyclists and pedestrians <br> - Improves active transportation network <br> - Traffic operations could mimic current operations of section of Newmark Ave west of Cammann St |
| Additional <br> Considerations | - Road Authority: Coos Bay <br> - Part of the Oregon Coast Bike Route (OCBR) <br> - Environmental constraints: None <br> - Available ROW: Can be constructed within available ROW <br> - Design should consider how this project could work with a realignment of Ocean Blvd/Newmark Ave <br> - No change in roadway surface <br> - No impacts to adjacent properties |  |
| Cost Opinion | Cost: \$25k <br> Cost opinion is in 2019 dollars and does not assum costs. Cost opinion does not include potential impa | right-of-way, utility relocation, new utilities or hazmat s to existing signalized intersections. |
| Implementation | - Medium priority <br> - Coordinate with OCBR |  |



|  |  | ntial Wayfinding Signage <br> "Bikes on Bridge" activated warning. <br> Source: Maryland Transportation Authority) |
| :---: | :---: | :---: |
| Purp | Facilitate improved connections for cyclists traveling between Coos Bay's downtown and Eastside district |  |
| Descriptio | Improve bicycle LTS through enhanced signage and wayfinding to connect Coos Bay UGB |  |
| Location | Newport Ln between the Coos Bay UGB boundary and across the Isthmus Slough Bridge |  |
| Roadway Characteristics | - Functional Classification: Minor Arterial <br> - Lanes: 2 <br> - Pavement Width: 24-26' <br> - Posted speed: 30 mph <br> - Existing (2018) ADT: 8,000-10,000 veh/day <br> - Forecast (2040) ADT: 10,000-12,000 veh/day | - Bicyclists must share road with vehicles <br> - Top 85\% SPIS site near Ellen Rd and on structure (2014-2016) <br> 5-Year Crash History (2012-2016): <br> - Majority of collisions are concentrated at intersection with US 101 and at bridge ends. |
| How Improvement Addresses Deficiencies | Existing/Future Deficiency <br> - Lack of wayfinding signage to direct cyclists to downtown and Eastside <br> - Bicycle level of traffic stress is 4 (highest), indication a high-stress environment | With Improvement <br> - Increases cyclists' level of comfort and ability to access Coos Bay destinations <br> - Improves multi-modal network |
| Additional Considerations | - Road Authority: Coos County <br> - Environmental constraints: This project is outside the UGB; the TSP did not inventory the environmental constraints outside the UGB, however it is within the 100-year flood plain <br> - There is a planned STIP project at the west end of Newport Lane <br> - Consider bicyclist activated push button "Bikes on Bridge" warning sign to utilize the existing ROW across the Isthmus Slough Bridge |  |
| Cost Opinion | Cost estimates was not prepared for projects where the scope/extents are undefined |  |
| Implementation | - High priority <br> - This is outside of the City's UGB and would need to be led by Coos County or ODOT |  |


| CB-20 <br> US 101 South | Bicycle Lanes | Coos Bay <br> Transportation System Plan |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |
| Purpose | - Provide facilities for cyclists on US 101 to the southern extent of the Coos Bay UGB <br> - Provide facilities for all travel modes |  |
| Description | Restripe to accommodate bicycle lane between southern end of couplet and the Coalbank Slough Bridge (options for additional signing/striping/ramp at bridge) |  |
| Location | US 101: South couplet to Coalbank Slough Bridge |  |
| Roadway Characteristics | - Functional Classification: Principal Arterial <br> - Lanes: 5 <br> - Pavement Width: 72' <br> - Posted speed: 30 mph <br> - Existing (2018) ADT: 26,500 veh/day <br> - Forecast (2040) ADT: 30,000 veh/day | 5-Year Crash History (2012-2016): <br> - 2 documented fatal or serious injury crashes in the immediate vicinity |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Lack of formal bicycle facilities on US 101 east of Kruse Ave and $1^{\text {st }}$ St <br> - Cyclists are forced to mix with vehicles or ride on sidewalk to cross bridge <br> - Bicycle lanes end at southern end of couplet <br> - Bicycles traveling in 14 ' curb lane with traffic | With Improvement <br> - 5'-6' striped bike lanes with 12 ' vehicle lanes <br> - Increased safety and accessibility for cyclists <br> - Improved bicycle network |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints: Located within the 100-year floodplain <br> - Could be constructed within available right of way <br> - Maintains "hole in the wall" for freight route <br> - Should consider with rebuilding of curb ramps |  |
| Cost Opinion | Cost: \$20k - \$75k <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - High priority <br> - Coordinate with Oregon Coast Bike Route |  |




## Existing <br> Intersection



Proposed Access Management


| Purpose | Address existing safety concerns by limiting the number of allowable traffic movements into and out of $19^{\text {th }}$ St at Ocean Blvd |  |
| :---: | :---: | :---: |
| Description | Enhanced channelization of side street to improve safety by limiting turns onto 19th St from Ocean Blvd. |  |
| Location | Ocean Blvd at 19th St |  |
| Roadway Characteristics | - Functional Classification: <br> - Ocean Blvd: Minor Arterial <br> - Woodland Dr/19th St/Ocean Ct: Local <br> - Lanes: <br> - Ocean Blvd: 3 lanes <br> - Woodland Dr/19th St/Ocean Ct: 2 lanes <br> - 19th St Pavement Width: 45' <br> - Posted speed: <br> - Ocean Blvd: 40 mph <br> - Woodland Dr/19th St/Ocean Ct: 25 mph <br> - ADT not available | 5-Year Crash History (2012-2016): <br> - 1 fatal injury crash at intersection |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Fatal injury crash at intersection <br> - Existing safety concerns <br> - High volume and higher speed roadway (Ocean Blvd) with many turning movements to and from minor street <br> - Limited sight distance | With Improvement <br> - Limited conflict points at the intersection of Woodland Dr/19th St and at Ocean Blvd/19th St <br> - Improved safety <br> - Traffic could access the neighborhood from Woodland Dr to the west or Ocean Ct to the east |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: None <br> - Available ROW: Could be constructed within available right of way <br> - Could also consider right-in/right-out only instead - would need to confirm turning movement traffic volumes to determine best access management option |  |
| Cost Opinion | Cost: TBD <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - Low priority |  |



| CB-33 <br> Koosbay Blvd | 0th St Realignment | Coos Bay Transportation System Plan |
| :---: | :---: | :---: |
|  | Existing Intersection | Potential "T" Intersection Alignment |
| Purpose | - This project will address and existing safety concer Koosbay Blvd's approach. | caused by poor sight lines and the angle in |
| Description | Realign intersection to "T" to improve visibility and |  |
| Location | Koosbay Blvd at 10th St |  |
| Roadway Characteristics | - Functional Classification: <br> - Koosbay Blvd: Major Collector <br> - 10th St: Minor Arterial <br> - Lanes: 2 <br> - Pavement Width: 28-36' <br> - Posted speed: 30 mph <br> - Existing (2018) ADT: 5,000-8,000 veh/day <br> - Forecast (2040) ADT: 5,000-8,000 veh/day | 5-Year Crash History (2012-2016): <br> - Exceeds statewide 90th percentile crash rate and critical crash rate <br> - Six of the eight crashes were rear end collisions, and the remaining two were turning collisions due to a range of improper driver behavior was the cause (following too closely, failing to yield right-of-way, inattention and speeding). |
| How Improvement Addresses Deficiencies | Existing/Future Deficiency <br> - Acute angle intersection <br> - Limited visibility, particularly for older drivers and those with difficulties turning their heads, necks, or upper bodies to get an adequate line of sight <br> - Difficult turning movements and increased exposure time to thru traffic | With Improvement <br> - Proper 90 degree alignment <br> - Increased line of sight <br> - Shorter exposure time and crossing distances <br> - Increased visibility and safety <br> - Could improve truck turning (NBR) |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: Koosbay Blvd is on a his <br> - Potential right of way impacts in the southeast qu <br> - Clearing of vegetation within sight triangles could <br> - Koosbay Blvd at US 101 was identified in the Oreg modified to accommodate heavy vehicles | storic landslide <br> drant <br> also improve sight distance <br> n Freight Plan as an intersection that should be |
| Cost Opinion | Cost: TBD <br> Cost opinion is in 2019 dollars and does not assume costs. | ight-of-way, utility relocation, new utilities or hazmat |
| Implementation | - Medium priority |  |


|  | Existing Intersec | Potential Improvement |
| :---: | :---: | :---: |
| Purpose | - Address existing safety concerns along US 101 <br> - Move toward access management | Coos Bay's southern city limits. |
| Description | Convert the intersection of Kruse Ave at US 101 Ave and improve S Front Street to minor arteria | ight-in/right-out, close access to 1st Street from Kruse ndard. |
| Location | US 101 at Kruse Ave |  |
| Roadway Characteristics | - Functional Classification: Principal Arterial <br> - Lanes: 5 <br> - Pavement Width: 72' <br> - Posted speed: 30 mph <br> - Existing (2018) ADT: 27,500 veh/day <br> - Forecast (2040) ADT: 30,000 veh/day | 5-Year Crash History (2012-2016): <br> - 2 documented fatal or serious injury crashes in the immediate vicinity <br> - Top $10 \%$ SPIS site (2013-2015) |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Lack of channelization between US 101, Kruse Ave and 1st St <br> - Increased density of driveways <br> - Top 10\% Safety Priority Index System site | With Improvement <br> - Channelization and improved access management off the US 101 mainline <br> - Improved safety <br> - Fewer conflicts |
| Additional Considerations | - Road Authority: ODOT (US 101) and Coos Bay (S <br> - Environmental constraints: Project is located w <br> - This improvement can be completed within the <br> - Would need to ensure access to 1st St from Fro | ront Street) <br> in the 100-year floodplain vailable right of way St or other local road network |
| Cost Opinion | Cost: \$100k <br> Cost opinion is in 2019 dollars and does not assume costs. | right-of-way, utility relocation, new utilities or hazmat |
| Implementation | - Should not limit left-in to Kruse Ave until Front <br> - Low priority | eet is improved to minor arterial standard |


| CB-35/36/37 <br> Curb Bump 0 | s at Multiple Locations | Coos Bay Transportation System Plan |
| :---: | :---: | :---: |
|  |  |  |
| Purpose | - Improve pedestrian safety through downtown Coos Bay <br> - Enhance pedestrian environment <br> - Traffic calming |  |
| Description | Curb bump outs/extensions (consistent through downtown) |  |
| Location | 10 St, near Central Ave; Ingersoll Ave, near 2nd St; and 7th St at Ingersoll Ave |  |
| Roadway Characteristics | - Varies - collector and arterial that serve as important east-west connections from downtown Coos Bay to the northwest and North Bend via Ocean Blvd <br> - Lanes: 2 <br> - Speed limit: 25 mph <br> - Existing (2018) ADT: 27,500 veh/day <br> - Forecast (2040) ADT: 30,000 veh/day | 5-Year Crash History (2012-2016): <br> - 2 crashes at 7th St and Ingersoll Ave, which exceeds the Statewide 90th percentile crash rate. Both crashes recorded were the result of drivers failing to yield the right-of-way. <br> - 17 crashes at $10^{\text {th }}$ St and Central Ave; 1 pedestrian-related collision <br> - Ingersoll St near $2^{\text {nd }}$ St is sited by Top 10\% Safety Index System |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Unmarked pedestrian crossings <br> - Lack of awareness of pedestrians by motorists | With Improvement <br> - Improved pedestrian crossings <br> - Increased pedestrian visibility and safety <br> - Enhanced pedestrian network <br> - Decreased crossing lengths <br> - Marked crosswalks identify the presence of pedestrian activity in the area <br> - Improved pedestrian and transit access benefits disadvantaged populations |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: Intersection at Ingersoll St and S $2^{\text {nd }}$ Ave is in 100 year floodplain <br> - Can be implemented within available right if way <br> - Use striping or materials that maximize crosswalk visibility <br> - Drainage and freight/emergency vehicle movement must be considered in design of curb extensions |  |
| Cost Opinion | Cost: $\$ 120 \mathrm{k}$ (\$40k at each intersection) <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - Low to medium priority |  |


| CB-39 Coos Bay  <br> Schoneman Ave Street Upgrade Transportation System Plan |  |  |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |
| Purpose | - Update Schoneman Ave to urban street standards to support future transportation needs <br> - Improve network connectivity and connection to John Topits Park |  |
| Description | Upgrade to collector standard (storm/curb/gutter/sidewalk) and connect to trail system in John Topits Park |  |
| Location | Schoneman Ave, near Lakeshore Dr to Newmark Ave |  |
| Roadway Characteristics | - Functional Classification: Major Collector <br> - Lanes: 2 <br> - Pavement Width: $36^{\prime}$ <br> - Posted speed: 25 mph <br> - Traffic volumes not available, but road serves mostly residential land uses | 5-Year Crash History (2012-2016): <br> - 1 crash at Morrison St (continuation of Schoneman Ave - north) and Lakeshore Dr |
| How Improvement Addresses Deficiencies | Existing/Future Deficiency <br> - Important north-south network connection with out-of-date standards <br> - Lacking sidewalks <br> - Limited connectivity between Schoneman Ave and existing trail system in John Topits Park | With Improvement <br> - Updated to collector standards with stormwater, curb, gutter, and sidewalks <br> - Increased network connectivity <br> - Increased accessibility for pedestrians <br> - Improved connections to John Topits Park |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: Project is located near sensitive lands (riverine and wetland) - need to minimize/avoid impacts. <br> - Would require additional right of way and driveway impacts <br> - Potential major utility relocation required to meet collector standard |  |
| Cost Opinion | Cost: \$1.4M <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - Low priority |  |


| CB-40 Coos Bay  <br> Newmark Ave/Ocean Blvd Realignment Transportation System Plan |  |  |
| :---: | :---: | :---: |
|  |  |  |
| Existing Intersection <br> Proposed Impro |  |  |
| Purpose | - Address and existing safety concern, caused by poor sight lines and the angle in Koosbay Blvd's approach <br> - Traffic calming <br> - Enhanced pedestrian crossing |  |
| Description | Provide raised "porkchop" median to shorten crossing distance and provide a pedestrian crossing of Ocean Blvd. |  |
| Location | Newmark Ave at Ocean Blvd |  |
| Roadway Characteristics | - Functional Classification: Minor Arterial <br> - Pavement Width: Newmark Ave: 46-66'; Ocean Blvd: 56' <br> - Posted speed: Newmark Ave: 30-35 mph; Ocean Blvd: 30-40 mph <br> - Existing (2018) ADT: <br> - Newmark Ave: 10,000-13,000 veh/day <br> - Ocean Blvd: 10,000-15,000 veh/day <br> - Forecast (2040) ADT: <br> - Newmark Ave: 10,000-15,000 veh/day <br> - Ocean Blvd: 10,000-15,000 veh/day | 5-Year Crash History (2012-2016): <br> - 17 crashes at intersection of Newmark Ave and Ocean Blvd |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Skewed intersection <br> - Increased pedestrian crossing distances <br> - Skewed/long crossing of Newmark Ave and no crossing of Ocean Blvd <br> - High volume intersection of two minor arterials and limited pedestrian crossing opportunities | With Improvement <br> - Increased line of sight <br> - Shorter exposure time and crossing distances for pedestrians <br> - Increased visibility and safety <br> - Increased access to transit <br> - Pedestrian refuge |
| Additional Considerations | - Road Authority: Coos Bay <br> - Environmental constraints: None <br> - Could be constructed within available right of way <br> - Would likely trigger improvements to traffic signal and current crossing of Newmark Ave <br> - Access management of the driveways in the southwest quadrant would be needed to provide pedestrian crossing |  |
| Cost Opinion | Cost: TBD; Cost estimates were not prepared for projects where the scope/extents are undefined Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - High priority |  |


|  |  |  |
| :---: | :---: | :---: |
|  | Existing | Potential Improvement |
| Purpose | - Traffic calming <br> - Improve safety <br> - Repurpose "pavement desert" |  |
| Description | Provide landscaping or pedestrian buffer to reduce large, underutilized pavement area on east side of US 101 South. |  |
| Location | US 101 South (east side): Johnson Ave to Kruse Ave |  |
| Roadway Characteristics | - Functional Classification: Principal Arterial <br> - Lanes: 2 <br> - Pavement Width: 72' <br> - Posted speed: 30 mph <br> - Existing (2018) ADT: 15,000 veh/day <br> - Forecast (2040) ADT: 17,000 veh/day <br> - Parking is currently allowed on east side of US 101 in this section | 5-Year Crash History (2012-2016): <br> - 2 documented fatal or serious injury crashes in the immediate vicinity <br> - Top 10\% SPIS site (2013-2015) |
| How <br> Improvement <br> Addresses <br> Deficiencies | Existing/Future Deficiency <br> - Wide area of pavement for only two lanes of traffic <br> - Underutilized pavement | With Improvement <br> - Delineation of US 101 and shoulder <br> - "Narrowed up" feeling of US 101 <br> - Traffic calming |
| Additional Considerations | - Road Authority: ODOT <br> - Environmental constraints: Project is located within the 100-year floodplain <br> - This improvement can be completed within the available right of way <br> - Could consider either landscaping, bioswale or pavement markings and candlesticks to delineate vehicular travel lanes from wide shoulder <br> - May impact existing business accesses <br> - Design would need to consider sight distance for travelers on US 101 and from business driveways |  |
| Cost Opinion | Cost: \$25k <br> Cost opinion is in 2019 dollars and does not assume right-of-way, utility relocation, new utilities or hazmat costs. |  |
| Implementation | - Low priority <br> - Consider extending north to Johnson Blvd to maintain continuity with planned ODOT improvements. |  |

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$ 。
VOLUME 2

Technical Memorandum \#10:
Transportation Improvement Finance Program

# TECHNICAL MEMORANDUM \#10 <br> Transportation Improvement Finance Program - Coos Bay (Task 8.4) 

Date: April 11, 2020
To: City of Coos Bay
Oregon Department of Transportation, Region 3
From: Angela Rogge, PE, David Evans and Associates, Inc. Matt Hartnett, EIT, David Evans and Associates, Inc.

Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
The purpose of this memorandum is to present what the City is reasonably likely able to fund and implement within the twenty (20) year planning horizon. The revenue forecasts developed in for Technical Memorandum \#3: Financial Funding Forecast and the projects from Technical Memorandum \#9: Preferred Alternative were used to assess the feasibility of funding the proposed solutions.

The alternatives were prioritized into two (2) systems:
Financially Feasible System (Tier 1) - List of Projects that are feasible to fund and implement within the twenty (20) year planning horizon using some combination of federal, state, local, and private funds

Illustrative System (Tier 2) - List of Projects that are needed and acceptable, but that are not reasonably likely to be funded within the twenty (20) year planning horizon. This list must be limited to the most important and strategic Projects for the area that go beyond current understanding of what is financially feasible

For projects to be included in the Tier 1 list, they should have:

- General estimate of timing for planned transportation facilities and major improvements;
- Planning-level cost estimates for each Project and service;
- Agency and Cities support;
- Acceptable costs relative to the anticipated benefits; and
- A well-defined and reasonable scale.


## Revenue Sources

The TSP helps guide future investments in the transportation system, from operations and maintenance to capital improvements. This section reviews the funding sources Coos Bay has historically used for improvements and maintenance to the transportation system, as well as a funding forecast through the 2040 planning horizon.

## Historic Funding Sources

Current and primary revenue sources that fund transportation system maintenance, operations, and capital improvements include:

- State Highway Fund or Surface Transportation Block Grant (STBG) program;
- State operating grants;
- State gas tax receipts;
- City franchise fees;
- Local Improvement Districts;
- Transportation Utility Fee;
- Jurisdictional Exchange Fund; and
- Urban Renewal.


## State Funding Sources

State Highway Fund or Surface Transportation Block Grant (STBG): This is a special federal-aid from the FHWA that provides flexible funding to States, Cities and other public agencies for transportation improvement and preservation projects. They are reimbursable federal aid funds, and may be used for projects on any public road, including active transportation infrastructure and transit.

State Operating Grants: Grants can be awarded by the federal government, private, or non-profit organizations. In most cases, agencies requiring funding for a transportation project have to apply to the plethora of grants available. The awarding organization then evaluates the grant proposal from each applicant, and selects a winner. The funds are provided with specific instructions on how they are to be used.

State Gas Tax Receipts: Taxes charged on fuel become part of the State's revenue which can then be used for transportation construction and improvement projects. Taxes are collected on fuels including gasoline, ethanol blends, diesel, biodiesel, propane, CNG (compressed natural gas), aircraft fuel, as well as any other usable fuel that can power a motor vehicle or aircraft. Currently, Oregon collects a fuel tax of $\$ 0.34$ per gallon of gasoline.

## City Funding Sources

City Franchise Fees: The City collects franchise fees from companies that utilize the public right-of-way to provide their services.

Local Improvement Districts (LIDs): This mechanism allows neighboring property owners to group together in order to improve public facilities, paying for them over time through individual assessments. LIDs are generally used to complete local street improvements, sidewalk improvements, or improvements to business districts.

Coos Bay has two designated LIDs: $22^{\text {nd }}$ Street and Minnesota Ave. The City has a Special Improvement (LID) Fund, which it uses for sewer, storm water, and street maintenance and improvements. Recently, most spending from this fund has provided for pavement maintenance and repair.

Tax Increment Financing (TIF)/Urban Renewal: TIF is a public financing method used to subsidize redevelopment, infrastructure, and other community-improvement projects. Through use of TIF, a city can divert future property tax revenue increases from a defined area or district (typically termed an
urban renewal district) and apply those revenues toward an economic development project or public improvement project in the community.

Coos Bay maintains an Urban Renewal Fund, monies from which are earmarked for capital streetscape improvements in the Downtown and Empire areas.

Transportation Utility Fee: Transportation utility fees are charges levied on developed properties and/or residents within a city. Revenues from these fees are used to maintain local streets and transportation facilities.

Jurisdictional Exchange Fund: In 2000, Coos Bay assumed ownership of 23 lane miles of formerly State owned and operated roadways along with $\$ 4.8$ Million to maintain these roads in perpetuity. Coos Bay City Charter dictates that only the interest collected on the monies in this fund can be used for maintenance if the jurisdictional exchange streets or debt service on road maintenance projects. Those streets involved in this transfer include parts of all of the following: Newmark Avenue, Empire Boulevard, Ocean Boulevard, Central Avenue, Commercial Avenue, Anderson Avenue, $6{ }^{\text {th }}$ Avenue, D Street, and Coos River Road.

In recent years, incomes from interest have been very small, and available revenues have been used to pay debt service for the Ocean Boulevard project. The City anticipates being able to have more resources that are available in this fund in the upcoming years to be used on maintenance of the jurisdictional exchange streets.

## Funding Forecast

## Revenue and Expenses

Using adopted budgets and a number of key assumptions, total revenue and expenses are estimated to determine available revenue to implement the projects identified in the TSP. Total revenue is estimated at approximately $\$ 58$ - $\$ 61$ million and total expenses are estimated at approximately $\$ 26$ million (see Table 1).

Coos Bay continues to be proactive in examining and pursuing other funding sources for transportation operations and maintenance and capital. The above estimates do not include revenues from any of the many strategies for which the City has discussed opportunities for implementation in the future. Receipt of grant awards and STP funds could also facilitate the completion of major capital improvement projects, however these monies are not assumed here.

The transportation expenses shown in Table 1 are assumed consistent with average levels for FY12 to FY17. If Coos Bay continues its funding levels for street maintenance, the City will have roughly $\$ 32$ to \$34 Million available for capital projects through the planning horizon (2040). Alternatively, Coos Bay could increase its level of maintenance spending and dedicate the remaining revenues to capital projects.

Table 1. Coos Bay Transportation Revenue/Expenses through 2040

| City of Coos Bay | 2019-2040 |
| ---: | ---: |
| Revenue (Case A) |  |
| St Hwy Fund - Allocated to City | $\$ 30,001,000$ |
| Franchise Fees | $\$ 8,800,000$ |
| Transportation Utility Fee | $\$ 20,000,000$ |
| Total | $\$ 58,801,000$ |
| Revenue (Case B) |  |
| St Hwy Fund - Allocated to City | $\$ 32,230,000$ |
| Franchise Fees | $\$ 8,800,000$ |
| Transportation Utility Fee | $\$ 20,000,000$ |
| Total | $\$ 61,030,000$ |
| Expense | $\$ 22,000,000$ |
| Operations and Maintenance | $\$ 4,400,000$ |
| Capital Expenditures | $\$ 26,400,000$ |
| Total | $\$ 32.4 M-\$ 34.6 M$ |

## Potential Additional Local Funding Mechanisms

Local Fuel Tax: Over two dozen Oregon cities and counties have adopted local fuel taxes, ranging from one ( $\$ 0.01$ ) to ten ( $\$ 0.10$ ) cents per gallon. Distributors of fuel within the city limits pay these taxes to the city monthly.

In November 2016, voters in both Coos Bay and North Bend defeated a measure proposing a local fuel tax dedicated to street improvement and maintenance. Leadership in the two cities jointly proposed the measure and conditioned its approval on it passing in both communities.

City officials are interested in reengaging citizens on a local fuel tax. In order to build broader political support for a new measure, Coos Bay and North Bend may want to consider a local fuel tax that is only levied during the summer months, when the area experiences higher visitor volumes. The cities of Newport and Reedsport levy seasonally adjusted local fuel taxes.

Transportation System Development Charges (SDCs): SDCs are collections from developers as new development occurs in the City. These charges are commonly based on trip generation rates associated with different type of development. Where implemented, SDC revenues are typically earmarked for transportation improvements related to the new development.

Coos Bay established SDCs in 2006, but placed a moratorium on them in 2008. The City has approximately $\$ 15,000$ remaining in its Transportation SDC Fund from the period during which it levied these charges. Reversing this moratorium and reinstituting SDCs could bolster Coos Bay's ability to expand its transportation network, particularly in higher growth areas.

Parking District Assessment: Parking district assessments are taxes levied on property owners in parking districts in order to provide for the operation and maintenance of parking facilities. Coos Bay is Transportation Improvement Finance Program Memorandum - Coos Bay
interested in exploring this strategy. Currently, resources from the City's State Gas Tax and Street Improvement Funds are used to operate and maintain public parking infrastructure.

Development Exactions: To provide adequate infrastructure in response to site-specific growth, capital improvements can be exacted as conditions of approval for building permits, subdivisions, and zoning actions. Developers may be required to complete frontage street improvements and other off-site transportation improvements to mitigate traffic impacts. Exactions are to be related to the project's measured impact on the infrastructure, known as "rational nexus".

General Obligation Bonds: Bonds are a funding mechanism for constructing capital improvement projects in the City. Voter-approved bonds are sold to fund street improvement projects. Transportation projects are usually grouped in "bond packages" that go before the public for voter approval. Voterapproved General Obligation Bonds are then supported through the City's property tax base.

Coos Bay has one general obligation bond at present - its 2009 fire station bond.
City General Fund Revenues: To secure more funding to build, operate, and maintain transportation facilities, the City may choose to use general property tax dollars or an increasing share of other General Fund revenues. Using this strategy, however, places transportation system funding in direct competition with other City services that may be already obligated, such as police, fire, libraries, and parks.

Other Local Funding Mechanisms: There are several other local taxes and fees that Oregon cities may consider in funding transportation capital and operations. These include, but are not limited to hotel/motel tax, employer payroll tax, and parking in-lieu fees.

## Implementation

Through the planning horizon, the City of Coos Bay will need to balance their existing maintenance backlog and needs with new capital projects. The community has expressed concern in the condition of the roads, and thus maintenance and road rehabilitation is a priority.

The suggested plan for implementation would allot nearly all of the transportation revenue for operations, maintenance and road rehabilitation for the first five years of the planning horizon. During this time, the city can continue to implement new projects if they can be packaged as part of a larger maintenance or rehabilitation project. After five years, the amount of revenue directed towards operations, maintenance and rehabilitation would shift to nearly 70 percent, with the remaining 30 percent focused on new capital projects. The City should continue to seek opportunities to pair maintenance with improvement projects where possible.

The Tier 1 list of projects in the TSP (next chapter) assumes the implementation plan proposed above. Priorities may change over time and unexpected opportunities may arise to fund particular projects. The City is free pursue any of these opportunities at any time. The proposed timeline for allocating transportation revenue is meant to guide, not dictate, the implementation of projects in the TSP.

## Transportation Improvement Finance Program

Recommended solutions were developed through an iterative process. The solutions (projects) work to address identified deficiencies in connectivity, amenities, safety, and operations with a focus on creating a balanced system able to provide travel options for a wide variety of needs and users.

Because the advancement of any project is contingent upon the availability of future funding, it is important to establish a flexible program of prioritized projects that meet the needs of diverse stakeholders while leveraging current and future funding opportunities. Ultimately, this refined and prioritized list is intended to serve as a menu of projects, with multiple factors that can be used together to assess the highest priority projects that can be completed within the available budget.

The recommended project list is composed of the following two lists, created based on each project's priority and likelihood to be funded:

1. The Tier 1 (Financially Constrained) Projects list identifies the projects (in no particular order) that could be constructed with funding anticipated through 2040. This list includes projects already committed in adopted documents.
2. Tier 2 (Needed but Unfunded) Projects list identifies projects (in no particular order) that are highly supported but that, due to cost or jurisdiction, were unable to be included in the Tier 1 list. Should additional funding become available, these are projects the City may want to consider.

The City is not required to implement projects identified on the Financially Constrained Projects list first. Priorities may change over time and unexpected opportunities may arise to fund particular projects. The City is free pursue any of these opportunities at any time.

The purpose of the Tier 1 Financially Constrained Projects list is to establish reasonable expectations for the level of improvements that will occur, and give the City initial direction on where funds should be allocated. The project design elements are identified for the purpose of creating a reasonable cost estimate for planning purposes. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary design and final design process, and are subject to City, Douglas County, and/or ODOT approval.

## Project Sheets

Project sheets were developed for several of the preferred alternatives to highlight important features of the project area and to serve as a resource for future project development. The project sheets may be found in Technical Memorandum \#9. The project sheets include a description of the proposed project and possible options and considerations for design elements. Not all of the preferred alternatives have a project sheet; they were created for projects that benefit from additional details or figures.

The images provided in this document are conceptual and for planning purposes only. Should a project be selected by the City or ODOT to be pursued further, the design features and cost estimates will be refined through the engineering process.

## Tier 1: Financially Constrained Project List

The Financially Constrained Project list includes projects that could be constructed with funding anticipated through 2040, if the City desires.
Table 2. Tier 1 Projects

|  | Project Name | Location | Description |  | - | \% | $\begin{aligned} & \frac{01}{0} \\ & \frac{0}{0} \\ & > \end{aligned}$ |  | $\frac{5}{5}$ | Primary Funding Source ${ }^{2}$ | $\begin{aligned} & \text { Prelim. Cost } \\ & \text { Estimate } \\ & (2019 \$)^{3} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Operations and Maintenance |  |  |  |  |  |  |  |  |  |  |  |
| 43 | Pavement <br> Maintenance | City wide | Fix Potholes. Maintain/fix/strengthen existing pavement system, account for maintenance in funding plan. Critical: Central Ave, Southwest Blvd, Koosbay Blvd, Blanco Ave, Radar Rd, Schoneman St, LaClair St, FSt, Butler Rd, Juniper Ave and Fulton Ave |  |  | X | X |  | X | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | $\$ 52,850,000$ <br> (Operations/ <br> Maintenance) |
| Capital Improvements |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Mingus Park Wayfinding | Mingus Park | Wayfinding signs to park | X | X |  |  |  | X | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$50,000 |
| 5 | Woodland Dr Pedestrian Improvements | Woodland Dr: North City Limits to Ocean Blvd | Add sidewalks on Woodland Dr, marked pedestrian crossing (access to Hospital/Medical Park) | X | X |  |  |  |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$3,200,000 |
| 6 | Thompson Rd Pedestrian Crossing | Thompson Road near Bay Area Hospital | Add marked crossing and mid-block crossing of Thompson Road to access hospital transit stop | X | X | X |  | X |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$50,000 |
| 7 | Hospital Way Sidewalk | Hospital Way near Medical Center (Immediate Care Clinic) | Add sidewalk to connect to medical facilities | X | X |  |  |  |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$560,000 |
| 10 | US 101 <br> Downtown <br> Pedestrian <br> Crossings | US 101: <br> Commercial Ave and Alder Ave | Improved bike/pedestrian crossings across US 101 to be consistent with Front Street Action Plan | X | X | X |  |  |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$100,000 |


| ID | Project Name | Location | Description |  | $\begin{aligned} & \text { O} \\ & 0 \\ & 000 \\ & \hline 0 \end{aligned}$ |  |  |  | Primary <br> Funding <br> Source ${ }^{2}$ | Prelim. Cost Estimate (2019 \$) ${ }^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 22 | N 14th St <br> Bicycle <br> Facilities | N $14^{\text {th }}$ St: <br> Teakwood Ave to Juniper Ave | Provide a parallel bicycle route to Koos Bay Blvd by providing sharrows and wayfinding on $\mathrm{N} 14^{\text {th }} \mathrm{St}$ |  | X |  |  |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$50,000 |
| 28 | Bike/Ped <br> Transit Connectivity | All Transit Routes | Improve bicycle and ped connectivity to stops | X | X | X | X |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | N/A |
| 38 | 4th Street Safety | 4th St: Market Ave to Golden Ave | Restripe to a 3-lane cross-section with sidewalk bumpouts. | X |  | X |  |  | $\begin{gathered} \text { Coos } \\ \text { Bay } \end{gathered}$ | \$4,500,000 |
| Operations/Maintenance |  |  |  |  |  |  |  |  |  | \$52,850,000 |
| Capital Projects |  |  |  |  |  |  |  |  |  | \$8,510,000 |
| Total |  |  |  |  |  |  |  |  |  | \$62,310,000 |

## Tier 2: Illustrative

The Tier 2 Projects list identifies projects classified as "Needed but Unfunded", also referred to during the planning process as "illustrative." The projects are highly supported but, because of their cost or jurisdiction, were unable to be included in the Tier 1 list. Should additional funding become available, these are projects the City may want to consider.

Table 3. Tier 2 Projects


|  |  |  | Upsrade sidewalks on both sides |  |
| :--- | :--- | :--- | :--- | :--- |


|  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |


| ID | Project Name | Location | Description | $\begin{aligned} & \text { c } \\ & \frac{10}{2} \\ & \text { b } \\ & \frac{0}{0} \\ & 0 \end{aligned}$ | $\begin{aligned} & \frac{1}{0} \\ & \frac{0}{0} \end{aligned}$ | $\frac{?}{4}$ | $\frac{0}{\frac{0}{c}}$ | $\begin{aligned} & \frac{\pi}{n} \\ & \frac{c}{c} \\ & \text { co } \end{aligned}$ | $\begin{aligned} & \text { 흔 } \\ & \frac{c}{4} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{n} \\ & \underset{\sigma}{\infty} \end{aligned}$ | Primary <br> Funding <br> Source ${ }^{2}$ | Prelim. <br> Cost <br> Estimate $(2019 \$)^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9 | Coos Bay Boardwalk RR Crossing Pedestrian Improvements | Coos Bay <br> Boardwalk (near <br> Anderson Ave and Market Ave) | Construct at-grade multimodal improvements (pavement) | X |  | X |  |  |  |  | Coos Bay/Coo s Bay Rail | \$500,000 |
| 14 | Connect the Boardwalks | North Bend, Mill Casino and Coos Bay Boardwalks | Connect the area boardwalks to create a five mile uninterrupted boardwalk. | X | X | X |  |  |  |  | North <br> Bend; <br> Coos <br> Bay; <br> Private | N/A |
| 18 | Newport Ln <br> Bicycle <br> Signage/Wayfi <br> nding | Newport Ln | Improve bicycle LTS through enhanced signage \& wayfinding to connect Coos Bay UGB |  | $X$ | X |  |  |  |  | Coos <br> County | N/A |
| 20 | US 101 <br> Southern <br> Bicycle Lanes | US 101: South couplet to Coalbank Slough Bridge | Restripe to accommodate bicycle lane (options for additional signing/striping/ramp at bridge) |  | $X$ | X |  |  |  |  | ODOT | $\begin{array}{r} \$ 20,000- \\ \$ 75,000 \end{array}$ |
| 21 | US 101 Bicycle Facilities | US 101 | Provide bicycle lanes (OCBR priority) through road widening or lane diet. |  | $X$ | X |  |  |  |  | ODOT | N/A |
| 24 | Bay Area Loop <br> Weekend <br> Service | Bay Area Loop | Add weekend service | X |  |  |  | $X$ |  |  | CCATD | N/A |
| 25 | Transit Service Hours | All Transit Routes | Extend service hours | X |  |  |  | $X$ |  |  | CCATD | N/A |
| 26 | Transit Frequency | US 101 \& Ocean Blvd Routes | Increase frequency \& add additional route | X |  |  |  | $X$ |  |  | CCATD | N/A |
| 27 | Shelters and Stops | All Transit Routes | Add shelters and stops near community destinations | $X$ | X | X |  | X |  |  | CCATD | N/A |


| ID | Project Name | Location | Description | $\begin{aligned} & \text { ¢ } \\ & \frac{0}{5} \\ & \frac{0}{8} \\ & 0.0 \end{aligned}$ | $\begin{aligned} & \frac{0}{0} \\ & \frac{0}{0} \\ & \hline 0 \end{aligned}$ |  |  | $\begin{aligned} & \text { 志 } \\ & \text { 元 } \end{aligned}$ | $\begin{aligned} & \text { پ } \\ & \stackrel{1}{0} \end{aligned}$ | $\frac{\sqrt{n}}{\frac{6}{\omega}}$ | Primary Funding Source ${ }^{2}$ | Prelim. <br> Cost <br> Estimate $(2019 \$)^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 29 | Regional <br> Transit Hub | Bay Area | Support CCATD in their pursuit of regional transit hub |  |  |  |  | X |  |  | CCATD | N/A |
| 30 | Transit Pull Outs | Coos Bay | Work with CCATD to identify locations for transit pull outs on busier streets |  |  | X | X | X |  |  | CCATD | N/A |
| 34 | US 101/Kruse Ave Access Management | US 101: near <br> Kruse Ave | Access management/channelization |  |  | X | X |  |  |  | ODOT | \$100,000 |
| 41 | South Coos Bay Pavement | US 101 South: Johnson Ave to Kruse Ave | Provide landscaping or pedestrian buffer to reduce large, underutilized pavement area on east side of US 101 South. |  |  | X | X |  | X |  | ODOT; <br> Coos Bay | \$25,000 |
| 44 | Newport <br> Ln/Isthmus <br> Slough Bridge <br> Widening | Newport <br> Ln/Isthmus <br> Slough Bridge | Widen structure to accommodate bicycle and pedestrians. Consider interim option to provide "bicycle warning beacons" on either side of bridge to indicate when bicyclists are present. | X | X |  | X | X |  |  | County; ODOT | N/A |
| 45 | Market <br> Ave/Front St <br> RR Crossing <br> Upgrade | Market Ave at Front St | Install at-grade rail active warning device | X | X | X | X |  | X |  | Coos Bay Rail | See Project 9 |
| 46 | Central Dock Rd RR Crossing Upgrade | US 101 at US plywood-Central Dock Rd | Install at-grade rail active warning device | X | X | X | X |  | X |  | Coos Bay Rail | \$500k |
| 47 | US 101/Curtis Ave Signal Head Upgrade | US 101 at Curtis Ave | Address Highway Over-Dimension Load Pinch Point by raising signal head |  |  | X | X |  | X |  | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | \$50k-100k |
| 48 | US <br> 101/Koosbay <br> Blvd Upgrades | US 101 at Koosbay Blvd | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  |  | X |  | X |  | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | N/A |
| 49 | US 101/Commerc | US 101 South at Commercial Ave | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  |  | X |  | X |  | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | N/A |


| ID | Project Name | Location | Description | $\begin{aligned} & \text { c } \\ & \frac{10}{0} \\ & \frac{1}{d} \\ & \frac{0}{0} \\ & \hline \end{aligned}$ |  |  |  |  | $\frac{\stackrel{\rightharpoonup}{6}}{\frac{0}{6}}$ | Primary Funding Source ${ }^{2}$ | Prelim. <br> Cost <br> Estimate $(2019 \$)^{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ial Ave Upgrades |  |  |  |  |  |  |  |  |  |  |
| 50 | US 101 North/ Johnson Ave Upgrades | US 101 North at Johnson Ave | Make modifications to accommodate high heavy vehicle volumes per OFP |  |  | X |  | X |  | $\begin{aligned} & \text { ODOT } \\ & \text { (OFP) } \end{aligned}$ | N/A |
| 51 | Marine Ways Enhancements | Charleston boatyard | Improvements that include the Marine Ways |  |  |  |  | X |  | POCB | N/A |
| 52 | North Spit Improvements | Oregon Gateway | North Spit improvements to accommodate a multimodal marine facility to handle bulk cargo, containers and an LNG export facility |  |  |  |  | X |  | POCB | N/A |
| 53 | Channel Widening/ Deepening | Coos Bay | Federal channel widening and deepening to accommodate larger ships and ensure safer operations |  |  |  |  | X |  | POCB | N/A |
| 54 | Charleston <br> Boatyard Dock Replacements | Charleston boatyard | Dock replacements | X |  |  |  | X |  | POCB | N/A |
| 55 | Expanded Passenger Service | Airport | Add direct commercial passenger service between Southwest Regional Airport and northwest hubs (Portland) |  |  |  |  | X |  | CCAD | N/A |
| 56 | Airport Transit Service | Airport | Provide transit service to airport if air passenger service increases | X |  |  | X | X |  | CCATD | N/A |

## N/A = Cost estimate not developed as part of the TSP

## Transportation System Plan

$\mathrm{A} \in \mathrm{B}$
VOLUME 2

Technical Memorandum \#11:
Policies and Standards

# TECHNICAL MEMORANDUM \#11 

Policies and Standards (Task 9.1) - Coos Bay
Date: October 17, 2019
To: $\quad$ City of Coos Bay
Oregon Department of Transportation, Region 3
From: Darci Rudzinski, Shayna Rehberg, and Courtney Simms, Angelo Planning Group Angela Rogge, PE, David Evans and Associates, Inc.

Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates
This memorandum presents policies and standards necessary to implement the updated City of Coos Bay Transportation System Plan (TSP). The first section describes an approach to updating the City's transportation policies and identifies areas that are important to retain and/or refine, consistent with the recommendations of the draft TSP. The second section focuses on transportation standards. Standards will be updated for inclusion in the draft TSP, as well as implemented through the Coos Bay Development Code. This memorandum describes potential changes to both the TSP and the code. Recommendations in this memorandum will be reflected in the draft TSP and will be addressed in Technical Memorandum \#12, which includes proposed updated City policy and development standards.

## Transportation Policy

The currently adopted TSP includes goal, policies, and action items. Proposed revisions to adopted goals and a set of objectives to guide the TSP update project are included in Technical Memorandum \#2. These were revised after City staff review and feedback from the Public Advisory Committee. A set of the final Goals and Objectives are in Attachment A. Many of the project objectives can serve as the City's transportation policy after TSP adoption. A few objectives are more specific to the update process itself and will need to be slightly modified to provide policy that will help guide future land use and transportation decision making. Some objectives may be better stated as action items; new action items also may be desired as a result of outstanding items in the draft updated TSP.

## Capital Improvements

The annual budget is a policy document that sets standards and establishes an action, operational, and financial plan for the delivery of city services. It has been prepared to provide a comprehensive overview of all City funds and services, and to give residents a better understanding of the city's operating and fiscal programs. While the city budget is a one-year document, a multi-year approach is used to consider the future implications of current fiscal conditions and decisions.

The budget accounts for Capital Improvement Funds, which provide funding for annual improvements such as street repairs, park enhancements, and wastewater collection and treatment infrastructure repairs and upgrades. The City of Coos Bay uses their TSP as a tool for identifying capital improvements related to transportation, but also relies on community feedback to address concerns on the local road system.

## Maintenance

A policy area that is addressed in the adopted TSP, but not in the update objectives, relates to maintenance. Existing Policy f. under Goal \#3 (a safe transportation system) states that the City will provide "satisfactory levels of maintenance to the transportation system in order to preserve user safety, facility aesthetics, and the integrity of the system as a whole." The City recently adopted a Transportation Utility Fee which produces funds exclusively for street repair and maintenance.

Another aspect of this policy area is the management of unmaintained facilities. For the purpose of this memorandum, "unmaintained" refers to unpaved public roads (dirt, gravel). The City is not responsible for maintenance of graveled roadway. However, on public roads, the City will grade and provide dust control, or maintain to a minimum standard to protect and access utilities.

The draft TSP will include a map depicting roadway jurisdiction and will identify the parties responsibly for maintenance and improvements. Existing policy statements will be reviewed and revisions as necessary will be developed to reflect the City's current plan and procedures related to maintaining roadways.

## Jurisdictional Exchange

The City took jurisdiction of 23 lane miles of streets from ODOT in 2000. The streets are Empire Boulevard, Newmark Avenue, Ocean Boulevard, Central Avenue, Anderson, Commercial, a portion of 4th Street, 6th Avenue, and Coos River Highway. At the time, a Jurisdictional Exchange Fund was created and can only be used to maintain those facilities. The City Charter further restricted the use of this resource whereby only the interest generated by the $\$ 4.8$ million (held in trust in its own interestbearing account) could be used for the repair and maintenance of the aforementioned streets.

The City is not currently interested in pursuing specific policy language surrounding Jurisdictional Exchanges; they do not have the available resources to manage and maintain additional facilities at this time. The jurisdictional map of roadway facilities along with continued partnering and coordination between various partner Agencies is how Coos Bay plans to determine responsibility for addressing facility needs.

## Multimodal Networks

The Goals and Objectives that guided the TSP update focus on multi-modal transportation solutions, including reducing reliance on single-occupancy vehicle trips by planning for bicycle facilities and providing safe passage for cyclists (See Attachment A, Goal \#3, Objective b.). There is City interest in providing better connections to the Oregon Coast Bike Route (OCBR), which is the current subject of a long-range planning effort. ${ }^{1}$ Updated policy language can articulate the City's interest and intent in providing enhanced connections to the OCBR.

## Development Review

The City is also currently revising residential infill policy. Revisions to housing standards may result in needed supportive transportation policy language and modifications to local street standards. See discussion under Transportation Standards in this memorandum.

[^51]Proposed policies, based on the TSP update objectives and consistent with draft TSP recommendations, will be included in Technical Memorandum \#12.

## Land Use Decisions

A policy area that would facilitate land use approval sought by government agencies other than the City pertains to who may initiate a land use application. In Coos Bay, current property owners are authorized to initiate land use applications (CBMC 17.130.050 and 17.360.020). The challenge for agencies like the Oregon Department of Transportation (ODOT), which has responsibility to plan for state transportation facilities and has the power of eminent domain, is one of timing. ODOT may not yet be the owner of the property where the improvement is planned at which time land use approval is needed, as property acquisition often happens very late in the project timeline. Allowing agencies with eminent domain powers (e.g., ODOT)) to initiate land use applications would simplify and facilitate project approval and development. This idea can be established in policy language as well as in development code language.

This idea can be established in policy language as well as in development code language. Proposed policies, based on the TSP update objectives and consistent with draft TSP recommendations, will be included in Technical Memorandum \#12.

## Transportation Standards

## Draft TSP Standards

## Street Standards

The City provides cross-section guidelines that reflect their accepted minimum right-of-way and roadway widths, which are summarized in the Coos Bay Municipal Code (CBMC) 18.15.010(2)(a)i) (Table 3-1) and summarized below. Typical cross-sections are included in the current TSP (adopted in 2004) and outline recommendations and requirements for number of travel lanes, bicycle and pedestrian facilities, and other amenities such as landscape strips and on-street parking. These cross sections are intended for planning and designing new roadways, as well as for improving existing roadways where it is physically and economically feasible.

Additional language (to be presented in Technical Memorandum \#12) for the adopted TSP will specify circumstances under lesser right of way standards may be permitted.

Table 1. Coos Bay Lane Widths and Configuration in the Vehicular Zone (Existing)

| TYPE OF STREET | MIN ROW WIDTH | MINIMUM PAVING WIDTH CURB TO CURB |  |  |  |  | MAX GRADE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | VEHICLE <br> TRAVEL LANE | MEDIAN OR CENTER TURN LANE | ON STREET PARKING | $\begin{gathered} \text { BIKE } \\ \text { LANE (A) } \end{gathered}$ | SIDEWALK CURB (B) |  |
| Arterial/Collector |  |  |  |  |  |  |  |
| 5-lane (c) | 100 ' | $12^{\prime} 11^{\prime}$ | $14^{\prime}$ | - | 2 @ 6' (g) | 2 @ 6'/5' | 8\% |
| 3-lane (c) | 76' | 12' | $14^{\prime}$ <br> (optional) | - | 2 @ 6' (g) | 2 @ 6'/5' | 8\% |
| 2-Iane | 50' | 12' | - | - | 2 @ 6' (g) | 2 @ 6'/5' | 8\% |
|  |  |  |  |  |  |  |  |
| 28' Standard Residential | 50' | $10^{\prime}$ | - | 1 @ 8' | - | 2 @ 5' |  |
| 36' Neighborhood Residential | $50^{\prime}$ | 10' | - | 2 @ 8' | - | 2 @ 5' | 16\% |


| TYPE OF STREET | MIN ROW WIDTH | MINIMUM PAVING WIDTH CURB TO CURB |  |  |  |  | $\begin{aligned} & \text { MAX } \\ & \text { GRADE } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | VEHICLE <br> TRAVEL <br> LANE | MEDIAN OR CENTER TURN LANE | ON STREET PARKING | $\begin{aligned} & \text { BIKE } \\ & \text { LANE (A) } \end{aligned}$ | SIDEWALK CURB (B) |  |
| 40' Standard Commercial/ Industrial | 60' | $12^{\prime}$ | - | 2 @ 8' | - | 2 @ 5' | 16\% |
| Dead End (d) | $50^{\prime}$ | $10^{\prime}$ | - | 2 @ 8' | - | 2 @ 5' | 16\% |
| Cul-de-sac (e) | $50^{\prime}$ | 10' | - | (d) | - | 1 @ 5' (f) | 16\% (d) |
|  |  |  |  |  |  |  |  |
| Alley |  |  |  |  |  |  |  |
| 1-way | $20^{\prime}$ | $12^{\prime}$ | - | - | - | - | - |
| 2-way | 20' | $16^{\prime}$ | - | - | - | - | - |

(a) New construction: six feet; reconstruction: five feet
(b) Wider sidewalks may be required in commercial areas
(c) The minimum right-of-way width includes the option of two six-foot-wide landscape strips for arterials or two four-foot-wide strips for local commercial/ industrial
(d) A dead end must be less than 400 feet in length and terminate with a circular or hammerhead turnaround with a maximum grade of eight percent.
(e) No parking is permitted at the end of a cul-de-sac which must have adequate space for emergency equipment turnaround, usually a 45 -foot unobstructed radius.
(f) At the end of the cul-de-sac, a five-foot sidewalk is required along the perimeter adjacent to the development.
(g) Bike lanes are allowed to be reduced to five feet in width if the project is a reconstruction.

The CBMC and TSP will need to be revised to align with current best practices which allow for multimodal facilities. The direction is to move toward slightly narrower lanes while still maintaining access for transit and emergency vehicles. This can be achieved through flexibility in cross-sections and minimum standards.

For Coos Bay, the TSP will recommend a minimum lane width of 11 feet on arterials and collectors not on a freight route. We would also propose at minimum right-of-way width on local roads of 40 feet, with minimum pavement widths of 20-28' (based on whether parking is allowed). Since the TSP will recommend the removal of the "Neighborhood Route" functional classification, the table will be revised to relabel the "Neighborhood Residential" to reflect that the cross-section is the "Standard Residential" with parking on both sides.

Municipal code language capturing the proposed changes will be proposed in Technical Memorandum \#12.

## Mobility Targets

Mobility targets for roads under Coos Bay jurisdiction are summarized in CBMC 18.15 .005 and will be referenced in the TSP Update. The purpose of mobility targets is to facilitate adequate traffic flow. Proposed development shall provide necessary street improvements and access management to, at a minimum, maintain the mobility targets and safety of abutting public streets as required by the TSP. The current code language is summarized below:

CBMC 18.15.005 Generally -" Level of Service (LOS). The level of service standard to determine what is acceptable or unacceptable traffic flow on streets shall be based on a volume-tocapacity ratio. City streets shall maintain a LOS of "D" during the p.m. peak hour of the day.

The wording in the CBMC will need to be revised (indicated with bold italic text) for consistency with current accepted terminology. The language should be revised to note that

Level of Service (LOS). The level of service standard to determine what is acceptable or unacceptable traffic flow on streets shall be based on average seconds of delay. City streets shall maintain a LOS of " D " during the peak 15 minutes of the day.

Code language capturing the proposed changes will be included in Technical Memorandum \#12.

## Access Management Standards

Minimum access spacing standards are established in the adopted TSP in tables that present minimum roadway standards and specifications. The current TSP will include the access spacing standards as outlined below. Additional language (to be presented in Technical Memorandum \#12) for the adopted TSP will specify circumstances under which lesser standards access spacing could be allowed for right-in-right-out only access points.

| TYPE OF STREET | MINIMUM ACCESS SPACING* |
| :---: | :---: |
| Arterial Streets | Between new access points: 500 feet |
| Collector Streets | Between new access points: 300 feet |
| Arterial-arterial <br> intersections | From the intersection: 300 feet |
| Arterial-Collector <br> intersections | From the intersection: 300 feet |
| Collector-Collector <br> intersections | From the intersection: 150 feet |
| State Highways or <br> County Roads | ODOT or county standards supersede city standards |
| *For City facilities, existing developed or undeveloped lots or parcels cannot be denied access. The maximum <br> access spacing possible should be provided unless it renders access to individual lots or parcels impractical. |  |

## Development Code Standards

The City's development regulations will need to be consistent with updated transportation standards. The Transportation Planning Rule (Oregon Administrative Rules Chapter 660, Division 12, or "TPR") ${ }^{2}$ specifies requirements related to local TSP implementation. ${ }^{3}$ This section provides a summary of recommendations related to the consistency of the CBMC with TPR requirements. Additional ideas for potential code modification have emerged during the TSP update process; these are also explored in this section. These recommendations and ideas will be reflected in adoption-ready municipal code amendments presented in Technical Memorandum \#12.

An evaluation of Title 17 (Coos Bay Development Code) and Title 18 (Engineering Design Standards) ${ }^{4}$ found that City requirements are largely consistent with the TPR. The full code evaluation is included in this memorandum as Attachment B. The evaluation also identifies some opportunities for the City to

[^52]better achieve and strengthen consistency with the TPR; Table 2 is a summary of those recommendations.

Table 2. Summary of TPR Consistency Recommendations

|  | Recommendation | TPR Citation |
| :---: | :---: | :---: |
| 1. | Transportation projects - Establish that transportation projects that are consistent with the TSP are permitted outright in each zoning district (CBMC Chapters 17.220-17.270). | Section -0045(1)(a) and (b) |
| 2. | Access spacing standards <br> - Add access spacing standards from the 2020 TSP, or references to the standards in the 2020 TSP, to the code (in CBMC 18.15.010(8)). <br> - Add standards for local streets. | Section -0045(2)(a) |
| 3. | Mobility standards - Ensure that mobility standards in the code (CBMC18.15.005) are consistent with recommendations in the 2020 TSP. | Section-0045(2)(b) |
| 4. | Agency coordination - Specify that transportation agencies be invited to participate in pre-application conferences (CBMC 17.130.020) and be required to receive hearing notices (CBMC 17.130.120). | Section -0045(2)(d) |
| 5. | Bicycle parking - Add bicycle parking requirements for transit transfer stations and park-and-ride lots in Table 17.330.030 (the number and design of spaces to be determined through development review). <br> Note: This recommendation requires further vetting with the City to determine appropriate wording. | Section-0045(3)(a) |
| 6. | Pedestrian access <br> - Require pedestrian access to the street (sidewalk), adjacent properties, and existing and planned transit stops for development other than single-family residential development. Consider as a new subsection in CBMC Chapter 17.335 (Supplementary Development Standards). <br> - Require "crosswalks" (walkways) through parking areas over a certain number of square feet or with more than a certain number of parking spaces in a new parking area design subsection in CBMC 17.330.030. <br> - Add requirements for non-motorized connections from cul-de-sacs to CBMC 18.15.10(9). <br> - Institute block size standards according to street functional classification in a new subsection in CBMC Chapter 18.15 (Transportation Facilities). | Section -0045(3)(d) and (6) |
| 7. | Transit-supportive development requirements - Establish requirements related to transit stops, including required amenities and building entrance orientation, for development other than single-family residential development in a new subsection in CBMC Chapter 17.335 (Supplementary Development Standards). | Section-0045(4)(a), (b), and (f) |
| 8. | Rideshare parking - Include preferential location provisions for rideshare (e.g., carpool) parking in a new subsection in parking design standards (CBMC 17.330.030). | Section -0045(4)(d) |
| 9. | Transit facilities in parking lots - Establish redevelopment of parking areas for transit uses (e.g., park-and-rides) as a permitted use in new | Section-0045(4)(e) |


|  | Recommendation | TPR Citation |
| :--- | :--- | :--- |
|  | provisions in CBMC Title 17, Section 17.330.020 (Joint use of <br> facilities). <br> Note: This recommendation requires further vetting with the City to <br> determine appropriate wording. |  |
| 10. | Minimized pavement - Establish narrower paved widths standards, <br> as compared to existing standards in Table 3-1 in CBMC 18.15.010(2), <br> under certain circumstances. | Section -0045(7) |
| 11. | TPR consistency - Add consistency with TPR Section -0060 as a <br> specific approval criterion for plan amendments and zone changes in <br> CBMC 17.360.060. | Section -0045(2)(g) and -0060 |

The following are other topic areas discussed during this planning process that reflect the desire for strong consistency and connections between the draft TSP and existing standards.

Travel Safety and Security

- Expand the purpose and intent statements in key land use districts in the city, such as Commercial Districts and the Waterfront Heritage District, to refer to safe and secure travel as referenced in TSP goals and objectives.


## Pedestrian and Bicycle Access

- Add pedestrian and bicycle access references to all commercial and central land use districts in the city. Alternatively, create a new code section addressing pedestrian and bicycle access under Supplementary Development Standards. (See Recommendation \#6 in Table 2.)
- Add language to the Urban Public District requiring pedestrian access between neighboring properties. Alternatively, address this type of standard in a new code section regarding pedestrian and bicycle access. (See Recommendation \#6 in Table 2.)
- Add criteria and requirements for pedestrian access to and along the waterfront (e.g., boardwalk opportunities) in the Waterfront Heritage District, the Waterfront Industrial District, and Hollering Place District.
- Update bicycle parking standards (in CBMC Table 17.330.030) to reduce the number of spaces required for schools and increase the number of spaces required for commercial uses.


## Administration and Housekeeping

- Require right-of-way dedications necessary to provide sufficient right-of-way in the development standards for the Industrial-Commercial District.
- Reconcile existing trip/traffic impact analysis requirements for the Waterfront Heritage District with the addition of language in CBMC Title 17 Section 17.240 and the City's existing traffic impact analysis requirements established in the Engineering Design Standards (CBMC Chapter 18.40).
- Relocate transit facilities requirements and cross-access easement requirements from Engineering Design Standards to the Development Code because they are more like development standards than engineering standards.


## Attachment A

## Goals and Objectives (Task 3.2)

The following are the recommended goals and objectives to guide the update of the North Bend and Coos Bay TSP as developed in Technical Memorandum \#2: Goals, Objectives and Evaluation Criteria.

Note: There is desire from City of Coos Bay staff to revisit the objectives listed below. In order to separate the review of deliverables, the proposed revisions to the objectives will be provided at a later date for the Public Advisory Committee to review - during the preparation of the Draft TSP document.

## Revising Transportation Goals and Objectives

At the most basic level, a TSP provides a blueprint for all modes of travel: motor vehicle (both personal and freight), bicycle, pedestrian, and transit. It is also an opportunity to build on community values and protect what makes the Bay Area a great place to live, work, and visit. The TSP should support a shared vision to be accessible, equitable, and livable communities.

A TSP's goals and objectives serve as the basis of evaluation criteria to assess multimodal plan options and identify plan priorities. For this update, current goals have been augmented to provide a more complete framework for planning for the cities multi-modal transportation system. Objectives associated with each goal guide the development or update of a TSP. Policies and action items in the existing TSPs largely provided this guidance. For this TSP update project, objectives are proposed that are aligned with project expectations. ${ }^{5}$ Objectives both reflect direction in the adopted TSPs, where still valid, and provide new direction. Topic areas in the proposed objectives that better reflect today's needs include tourism and recreation, health, agency coordination, and strategic investments.

Table 3. Summary of Existing vs. Proposed Goals

| Existing Goal | Proposed Goal |
| :--- | :--- |
| Goal \#1: Transportation facilities designed and <br> constructed in a manner to enhance [North <br> Bend/Coos Bay]'s livability and meet federal, state, <br> regional, and local requirements. | Eliminate and retain topics under proposed goals. |
| Goal \#2: A balanced transportation system. | Goal \#1: Continue development of an interconnected, <br> multimodal transportation network that connects all <br> members of the community to destinations within and <br> beyond the city. |
| Goal \#3: A safe transportation system. | Goal \#2: Provide a transportation system that <br> enhances the safety and security of all transportation <br> modes. |
| Goal \#4: An efficient transportation system that <br> reduces the number and length of trips, limits <br> congestion, and improves air quality. | Goal \#3: Optimize the performance of the <br> transportation system for the efficient movement of <br> people and goods. |
| Goal \#5: Transportation facilities that serve <br> and are accessible to all members of the community. | Goal \#4: Provide an equitable, balanced and <br> connected multi-modal transportation system. |
| Goal \#6: Transportation facilities that provide efficient <br> movement of goods and services. | Goal \#5: Provide a transportation system that <br> supports existing industry and encourages economic <br> development in the city. |
| Goal \#7: Implement the transportation plan by <br> working cooperatively with federal, State, regional, <br> and local governments, the private sector, and <br> residents. Create a stable, flexible financial system. | Goal \#6: Develop and maintain a Transportation <br> System Plan that is consistent with the goals and <br> objectives of the city, Coos County, and the state. |
| Goal \#7: Provide a sustainable transportation system <br> through responsible stewardship of financial <br> resources. |  |
| Goal \#8: Provide a transportation system that |  |
| enhances the health of residents and users and that |  |
| minimizes impacts to the environment. |  |

[^53]Goal \#1: Continue development of an interconnected, multimodal transportation network that connects all members of the community to destinations within and beyond the city.

## Objectives:

a) Improve, as needed, and retain existing connections between households and schools, parks, transit stops, the waterfront and other essential destinations and recreational areas. Provide a network of arterials, collectors and local streets that are interconnected, appropriately spaced, and reasonably direct in accordance with city and state design standards and the Transportation System Plan.
b) For new development, provide for multi-modal circulation internally on site and externally to adjacent land use and existing and planned multi-modal facilities.
c) Support off roadway walkways and bikeways that help to connect communities, provide options to motorized travel, or promote and support walking and biking tourism.
d) Require sidewalks on all new streets within the Urban Growth Boundary and that these facilities be designed to the standards in the adopted Transportation System Plan.
e) Ensure access to schools, parks, and other activity centers for all members of the community, including children, disabled, low-income, and elderly people.
f) Ensure adequate access to transit facilities and services.
g) Upgrade existing transportation facilities, including retrofitting for American Disability Act (ADA) compliance, and work with public transportation providers to provide services that improve access for all users.
h) Ensure American Disability Act (ADA) compliance for new transportation facility infrastructure.
i) Ensure planned pedestrian throughways are clear of obstacles and obstructions (e.g., utility poles) and continue to identify, and as resources permit, eliminate obstacles and obstructions for existing facilities.

Goal \#2: Provide a transportation system that enhances the safety and security of all transportation modes.

## Objectives:

a) Address existing safety issues at high collision locations and locations with a history of severe vehicle, bicycleand/or pedestrian-related crashes.
b) Manage access to transportation facilities consistent with their applicable classification to reduce and separate conflicts and provide reasonable access to land uses.
c) Improve the safety of rail crossings.
d) Identify and improve safe crossings for vehicles, bicycles and pedestrians across Highway 101 and major arterials.
e) Maintain and enhance lifeline and evacuation routes in coordination with local, regional, state and private entities.
f) Coordinate with law enforcement and emergency service providers to increase public safety and security.
g) Consider neighborhood traffic management strategies to improve safety for pedestrians, bicyclist, and vehicles and where certain techniques may be warranted.
h) Identify and designate bus routes to and around schools that are safe for pedestrians and bicyclists, as well as people in cars and arriving by bus.

Goal \#3: Optimize the performance of the transportation system for the efficient movement of people and goods.

## Objectives:

a) Maintain, and modify as necessary, street functional classifications, along with operational guidance and cross-sectional and right-of-way standards, to ensure streets are able to serve their intended purpose.
b) Reduce reliance on single-occupancy vehicle trips by planning for bicycle and pedestrian facilities that encourage non-vehicular travel and provide safe passage for pedestrians and bicyclists.
c) Reduce reliance on the state system for making local trips by providing a network of arterials, collectors and local streets that are interconnected, appropriately spaced, and reasonably direct in accordance with city and state design standards and the Transportation System Plan.
d) Preserve and maintain the existing transportation system in a state of good repair.
e) Develop a program to systematically implement improvements for all modes that enhance mobility at designated high-priority locations.
f) Adopt a standard for mobility to help maintain a minimum level of freight and/or motor vehicle travel efficiency and by which land use proposals can be evaluated. State and city mobility standards will be supported on facilities under the respective jurisdiction.
g) Work with [North Bend/Coos Bay], Coos County, and ODOT to develop, operate and maintain intelligent transportation systems and technological solutions that reduce travel delay and improve system efficiency, including coordination of traffic signals and improved traveler information.
h) Coordinate with Coos County Area Transit to develop system enhancements that support the movement of people in high traffic corridors.

Goal \#4: Provide an equitable, balanced and connected multi-modal transportation system.

## Objectives:

a) Ensure that the transportation system provides equitable access to underserved and vulnerable populations. Prioritize walking and biking investments in underserved areas with transportation disadvantaged populations.
b) Provide connections for all modes that meet applicable city and Americans with Disabilities Act (ADA) standards.
c) Require multi-modal circulation internal to a development site, as well as connecting to adjacent land use and existing and planned multi-modal facilities.

Goal \#5: Provide a transportation system that supports existing industry and encourages economic development in the city.

## Objectives:

a) Improve the movement of goods and delivery of services throughout the city while balancing the needs of all users with a variety of travel modes and preserving livability in residential areas and established neighborhoods.
b) Prioritize efficient freight movement on identified freight routes and recognize the importance of freight intermodal connectors as the last mile connections between state highways and intermodal freight facilities.
c) Identify lower cost options or provide funding mechanisms for transportation improvements necessary for development to occur.
d) Program transportation improvements to facilitate the development of desired land uses and activities.
e) Encourage recreational tourism by developing connections to and between major recreational locations and destinations and key services in the city.
f) Encourage tourism by promoting and upgrading bicycle and pedestrian recreational routes and services through the city.
g) Designate major tourist routes for provisions of enhanced streetscape and directional markings.
h) Support recreational transit use to boost tourism, enhance economic development, and reduce the environmental impacts of automobile traffic. Explore options to enhance tourist transit use with Coos County Area Transit, including the use of seasonal trolleys, and with businesses that attract tourists, such as local casinos.

Goal \#6: Develop and maintain a Transportation System Plan that is consistent with the goals and objectives of the city, Coos County, and the state.

## Objectives:

a) Ensure consistency with state, regional and local planning rules, regulations, and standards.
b) Coordinate land use, financial, and environmental planning to prioritize strategic transportation investments.
c) Coordinate land use and transportation decisions to efficiently use public infrastructure investments to:

- Maintain the mobility and safety of the roadway system
- Foster efficient development patterns
- Encourage the availability and use of transportation options such as biking, walking and taking transit
- Plan for efficient and safe emergency response and evacuation needs
d) Coordinate with [North Bend/Coos Bay], Coos County, and the Oregon Department of Transportation to implement system management and operations strategies on arterials and highways.
e) Coordinate with Coos County Area Transit to strengthen the efficiency and performance of the transit network and to support the multimodal system.

Goal \#7: Provide a sustainable transportation system through responsible stewardship of financial resources.

## Objectives:

a) Develop and support reasonable alternative mobility targets for motor vehicles that align with economic and physical limitations on state highways and city streets where necessary.
b) Preserve and maintain the existing transportation system assets to extend their useful life.
c) Improve travel reliability and efficiency of existing major travel routes in the city before adding capacity.
d) Pursue grants and collaboration with other agencies to efficiently fund transportation improvements and supporting programs.
e) Identify and maintain stable and diverse revenue sources to meet the need for transportation investments in the city.
f) Identify new and creative funding sources to leverage high priority transportation projects.

Goal \#8: Provide a transportation system that enhances the health of residents and users and that minimizes impacts to the environment.

## Objectives:

a) Identify and seek funding for programs that encourage walking, bicycling, and transit.
b) Provide convenient and direct pedestrian and bicycle facilities and routes to promote health and the physical and social well-being of residents, to reduce vehicular traffic congestion, to provide community and recreational alternatives, and to support local commerce and economic development.
c) Plan for a multi-modal system that limits users' exposure to pollution and that enhances air quality.
d) Consider noise attenuation in the design, redesign, and reconstruction of arterial streets immediately adjacent to residential development.
e) Relate the design of street capacity and improvements to the intended use of the facility.
f) Minimize impacts to the scenic, natural and cultural resources in the city.
g) Avoid or minimize impacts to natural resources, which may include alternative transportation facility designs in constrained areas.
h) Reduce the number of vehicle-miles traveled.
i) Increase the number of walking, bicycling, and transit trips in the city.
j) Develop transportation standards that preserve and protect the integrity of neighborhoods.
k) Support alternative vehicle types by identifying potential electric vehicle plug-in stations and developing implementing code provisions.
I) Evaluate and implement, where cost-effective, environmentally friendly materials and design approaches (water reduction methods to protect waterways, solar infrastructure, impervious materials).
m) Support technology applications that improve travel mobility and safety with less financial and environmental impact than traditional infrastructure projects.
n) Roadways within the city shall be multi-modal or "complete streets," with each street servicing the needs of the various modes of travel.

## Evaluation Criteria

The evaluation criteria will be used to evaluate and prioritize future transportation programs and improvements against the goals and objectives. A broad set of evaluation criteria that represent the proposed set of goals are summarized below.

## Table 4. Proposed Evaluation Criteria

\(\left.$$
\begin{array}{|ll|}\hline \text { Proposed Goal } & \text { Criteria } \\
\hline \begin{array}{l}\text { Goal \#1: Develop an interconnected, } \\
\text { multimodal transportation network that } \\
\text { connects all members of the community to } \\
\text { destinations within and beyond the city. }\end{array} & \begin{array}{l}\text { - Improves or creates access to community destinations } \\
\text { - Improves facilities for those using mobility devices }\end{array} \\
\hline \begin{array}{l}\text { - Enhances the active transportation or transit network }\end{array} \\
\text { that enhances the safety and security of all } \\
\text { transportation modes. }\end{array}
$$ \begin{array}{l}- Project is primarily a safety improvement (crossings, <br>
intersections, visibility, all modes) <br>

- Enhances emergency preparedness/community resiliency\end{array}\right]\)| - Project improves safe routes to school |
| :--- | :--- |

## Attachment B

## TPR Evaluation of the Coos Bay Municipal Code Title 17 (Development Code) and Title 18 (Engineering Design Standards)

| TPR Requirement | Local Development Code Reference |
| :--- | :--- |
| OAR 660-012-0045 |  |

(1) Each local government shall amend its land use regulations to implement the TSP.
(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use:
(A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals;
(B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards;
(C) Uses permitted outright under ORS 215.213(1)(j)-(m) and 215.283(1)(h)-(k), consistent with the provisions of OAR 660-012-0065; and
(D) Changes in the frequency of transit, rail and airport services.
(b) To the extent, if any, that a transportation facility, service, or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment.
(a) The purpose of this provision is to allow for certain transportation uses, such as operation, maintenance, and repair of transportation facilities identified in the TSP, without being subject to land use regulations.
Title 12 of the Coos Bay Municipal Code (CBMC) regulates streets, sidewalks, and public places. This includes public rights-of-way, including regulatory authority and standards for work within the rights-ofway.
Chapter 18.15 of CBMC Title 18 (Engineering Standards) regulates the transportation facility construction and maintenance responsibilities regarding street improvements and nonmotorized facilities and transit infrastructure.
The Coos Bay Development Code, Title 17 of the CBMC, contains the permitted uses for each of the zoning districts within the city.
(b) Transportation improvements generally are not listed as permitted uses in zone use tables in Title 17. Public transit facilities (e.g., park and rides), commercial parking structures, and bus shelters are generally permitted outright.
Recommendation(s):
Permit transportation facilities outright that are consistent with the adopted TSP. Identify them as such under "Nonresidential Permitted Uses," "Public Services and Facilities," or "Civic" categories as appropriate in each zoning district (CBMC Chapters 17.220 through 17.270).

This TPR section references project development and implementation - how a transportation facility or improvement authorized in a TSP is designed and constructed (660-012-0050). Project development may or may not require land use decision-making. The TPR directs that during project development, projects authorized in an acknowledged TSP will not be subject to further justification with regard to their need, mode, function, or general location. To this end, the TPR calls for consolidated review of land use decisions and proper noticing requirements for

TPR Requirement
review of land use decisions required to permit a transportation project.

## Local Development Code Reference

affected transportation facilities and service providers.
The CBMC allows for concurrent applications for more than one type of review for a given development, unless otherwise prohibited from doing so by law. No prohibition for transportation projects specifically exists.
Recommendation(s):
Existing code language complies with this requirement and no amendments are recommended.
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities corridors and sites for their identified functions. Such regulations shall include:
(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;
(b) Standards to protect the future operations of roads, transitways and major transit corridors;

Engineering design standards for transportation facilities are regulated under Chapter 18.15, which includes lane widths and configurations by road classification in Table 18.15.005(3-1).
Existing access spacing standards are established for collector and arterial streets in the adopted 2004 Coos Bay TSP (Tables 3-6 and 3-7). CBMC 18.15.010(8), which addresses access to City streets, states that access to a City street requires a permit from the City; however, the section does not establish or reference access spacing standards, Recommendation(s):
Confirm with the City whether existing spacing standards (2004 TSP Tables 3-6 and 3-7) are sufficient.
Consider adding standards for neighborhood route and local streets.
Add access spacing standards or references to them in the code (in CBMC 18.15.010(8)).
CBMC 18.15.005 and CBMC Chapter 18.40 address Traffic Impact Analysis (TIA) requirements for developments that may impact operations of transportation facilities, based on listed applicability criteria. Mobility standards (a minimum level of service "D" on City streets during the p.m. peak hour) are established in CBMC 18.15.005.
Recommendation(s):
Ensure that existing mobility standards in the Code are consistent with recommendations in the updated TSP.

| TPR Requirement | Local Developm |
| :---: | :---: |
| (c) Measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation; | The Southwest Oregon Regional Airport is located in North Bend. No airport noise corridor or areas impacted by the airport are located within Coos Bay. Recommendation(s): <br> Existing code language complies with this requirement and no amendments are recommended. |
| (d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites; | See response and proposed amendments related to 0045(1)(c). <br> Pre-application (CBMC 17.130.020) and hearing notice (CBMC 17.130.120) procedures currently state that "affected service districts" may be invited to attend pre-application meetings and "agencies with jurisdiction" must be notified of public hearings. Transportation and transit agencies are not specified. Recommendation(s): <br> Specify that transportation agencies be included in pre-application conferences and hearing notices. |
| (e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites; | This section is implemented by CBMC Chapter 18.40 (Traffic Impact Analysis Requirements). Chapter 18.40 states: "The TIA shall determine all improvements and/or mitigation measures necessary to meet City performance standards. For each phase of development, improvements shall be identified to accommodate additional traffic generated by this project." <br> Chapter 17.347 addresses Conditional Uses. Chapter 17.347 provides that the Planning Commission has the ability to impose conditions of approval necessary to provide public facilities with the capacity and design to serve the proposed use. <br> Recommendation(s): <br> Existing code language complies with this requirement and no amendments are recommended. |
| (f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of: <br> (A) Land use applications that require public hearings; <br> (B) Subdivision and partition applications; <br> (C)Other applications which affect private access to roads; and <br> (D)Other applications within airport noise corridor and imaginary surfaces which affect airport operations; and | Notice of applications for Type II and hearings for Type III will be sent to all agencies with jurisdiction over the subject property (CBMC 17.130.120 (4)). Per CBMC 17.130.020 (4), pre-application notice is sent to interested agencies within a week of the preapplication receipt. The Director determines who is invited to the meeting, which can include: the design assistance team (DAT), public works and community development director, or their designee, the consulting city engineer, a representative from affected service districts, and representatives from interested state agencies and neighborhood |

TPR Requirement
g) Regulations assuring amendments to land use designations, densities, and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP.

Local Development Code Reference
associations recognized by the city council or by Coos County.
Recommendation(s):
Existing code language complies with this requirement and no amendments are recommended.
See response and proposed amendments related to TIAs in -0045(2)(b) and plan and land use regulation amendments in -0060.
Recommendation(s):
Augment criteria for plan amendments and zone changes to specifically refer to require consistency with the TSP for all improvements to sites during TIAs.
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.
(a) Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots.
(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Singlefamily residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways.

Table 17.330.030 in Chapter 17.330 addresses bicycle parking for multifamily residential, commercial, industrial, institutional, and public uses.
Recommendation(s):
Existing code language generally complies with this requirement. It is recommended that bicycle parking for transit transfer stations and park-and-ride lots be specified (number and design of spaces to be determined as part of development review).
On-site circulation and connections: Addressed as part of the CBMC 17.365.050 (Submittal requirements). For Type II and Type III site plan reviews, proposed pedestrian access must be shown; however, minimum requirements regarding this access are not established. Pedestrian access requirements are established in some zones (e.g., in the Industrial-Commercial District, CBMC 17.235.040(7)).

Parking Lots: Pedestrian access through parking lots is required to be shown in site plans for Type III site plan review applications. Pedestrian access for multifamily properties is required to be provided to transit corridors without having to pass through parking lots (CBMC 17.330.060).

## TPR Requirement

(A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers;
(B) Bikeways shall be required along arterials and major collectors. sidewalks shall be required along arterials, collectors and most local streets in urban areas except that sidewalks are not required along controlled access roadways, such as freeways;
(C) Cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes set forth in this section;
(D) Local governments shall establish their own standards or criteria for providing streets and accessways consistent with the purposes of this section. Such measures may include but are not limited to: standards for spacing of streets or accessways; and standards for excessive out-of-direction travel;
(E) Streets and accessways need not be required where one or more of the following conditions exist:
(i) Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided;
(ii) Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or
(iii) Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection.
(c) Where off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle and pedestrian travel,

## Local Development Code Reference

Bikeways and sidewalks: Street standards are addressed in CBMC 18.15.010. Bicycle lanes are required along arterials/collector streets, and sidewalks are required on all streets but alleys. Street standards and pedestrian access is identified in CBMC 18.15.010(3) (Walking Zone).

Cul-de-sacs: Street standards for cul-de-sacs are addressed in Chapter 18.15. Layout for cul-de-sacs includes requirements to allow turning for emergency access vehicles. No requirements regarding nonmotorized connections through cul-de-sacs are mentioned.
Street and Accessway layout: CBMC 17.362.040 addresses access and roads in planned unit developments. Block lengths for streets do not have standards.
Recommendation(s):
Require "crosswalks" (walkways) through parking areas over a certain size in a new parking area design subsection in CBMC 17.330.030.
Require pedestrian access to the street (sidewalk), adjacent properties, and transit stops (existing or planned) for all commercial, institutional, and multifamily development. Consider adding as a new subsection in CBMC Chapter 17.335 (Supplementary Development Standards).
Require non-motorized connections from cul-de-sacs in CBMC 18.15.10(9).
Institute block size standards according to street functional classification in a new subsection in CBMC Chapter 18.15 (Transportation Facilities).

## TPR Requirement <br> including bicycle ways on arterials and major collectors. <br> [Note: Subsection (d) defines safe and convenient.] <br> (e) Internal pedestrian circulation within new office parks and commercial developments shall be provided through clustering of buildings, construction of accessways, walkways and similar techniques.

## Local Development Code Reference

Existing code language complies with this requirement and no amendments are recommended.

Access, circulation and transportation requirements are required to be evaluated in a TIA done on any commercial/industrial space over 20,000 square feet. See response and proposed amendments related to access/spacing standards in -0045(3)(b). Recommendation(s):
Existing code language complies with this requirement and no amendments are recommended.
(4) To support transit in urban areas containing a population greater than 25,000 , where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)-(g) below:
(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate;
(b) New retail, office and institutional buildings at or near major transit stops shall provide for convenient pedestrian access to transit through the measures listed in (A) and (B) below.
(A) Walkways shall be provided connecting building entrances and streets adjoining the site;
(B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable. Pedestrian connections shall connect the [sic] circulation system to existing or proposed

Transit facilities must be coordinated with Coos County Area Transit per CBMC 18.15.040 if the site is located within 100 feet of an existing or planned transit route or stop. ADA-accessible transit stop improvements, pedestrian connections to transit stop locations and furnishings such as shelters, benches, bicycle racks and/or other amenities may be required by public works.
Recommendation(s):
Establish transit-supportive development requirements for development other than singlefamily residential development in a new subsection in CBMC Chapter 17.335 (Supplementary Development Standards). Requirements include coordination and provision of transit stop amenities and orientation of building entrances toward transit streets.
CBMC 18.15.040 provisions that developers coordinate with the transit provider and public works, which may require pedestrian connections to transit stop locations. This section is required to be part of the TIA evaluations regarding access, circulation and other transportation requirements. TIAs are required for development or redevelopment projects over 20,000 square feet or more or commercial/industrial space or multifamily projects of 20 or more units.
Requirements in the Commercial-Industrial District (CBMC 17.235.040(6) and (7)) address transit stop improvements and pedestrian access. However,

## TPR Requirement

streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property;
(C) In addition to (A) and (B) above, on sites at major transit stops provide the following:
(i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or a street intersection;
(ii) A reasonably direct pedestrian connection between the transit stop and building entrances on the site;
(iii) A transit passenger landing pad accessible to disabled persons;
(iv) An easement or dedication for a passenger shelter if requested by the transit provider; and
(v) Lighting at the transit stop.
(c) Local governments may implement (4)(b)(A) and (B) above through the designation of pedestrian districts and adoption of appropriate implementing measures regulating development within pedestrian districts. Pedestrian districts must comply with the requirement of (4)(b)(C) above;
(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools;
(e) Existing development shall be allowed to redevelop a portion of existing parking areas

## Local Development Code Reference

other zoning districts do not appear to establish similar requirements.
Recommendation(s):
Establish transit-supportive development requirements for development other than singlefamily residential development in a new subsection in CBMC Chapter 17.335 (Supplementary Development Standards). Requirements include coordination and provision of transit stop amenities and orientation of building entrances toward transit streets.

The City of Coos Bay does not currently have pedestrian district designations. Identifying and determining the requirements related to a specific pedestrian district or districts that include existing or planned major transit routes is not an anticipated outcome of the TSP planning project.
Recommendation(s):
Existing code language complies with this requirement and no amendments are recommended.
Table 17.330.010(A) (Off-Street Parking Requirements) addresses off-street parking requirements based on use. Employee parking areas are addressed in CBMC 17.330.030, which states that off-street parking shall be primarily employee parking. No carpool/vanpool requirements are established.
Recommendation(s):
Include preferential location provisions for rideshare (e.g., carpool and vanpool) parking in a new subsection in parking design standards (CBMC 17.330.030).

Redevelopment of parking areas for transit-oriented uses or facilities is not addressed within the CBMC.

| TPR Requirement | Local Development Code Reference |
| :---: | :---: |
| for transit-oriented uses, including bus stops and pullouts, bus shelters, park and ride stations, transit-oriented developments, and similar facilities, where appropriate; | Recommendation(s): <br> Provide allowances for redevelopment of parking areas for transit uses as new provisions in CBMC 17.330.030 (Joint use of facilities). |
| (f) Road systems for new development shall be provided that can be adequately served by transit, including provision of pedestrian access to existing and identified future transit routes. This shall include, where appropriate, separate accessways to minimize travel distances; | See response about authority to condition approval in -0045(4)(a). <br> Recommendation(s): <br> Establish transit-supportive development requirements for development other than singlefamily residential development in a new subsection in CBMC Chapter 17.335 (Supplementary Development Standards). Requirements include coordination and provision of transit stop amenities and orientation of building entrances toward transit streets. |
| (g) Along existing or planned transit routes, designation of types and densities of land uses adequate to support transit. | See response about authority to condition approval in -0045(4)(a). <br> Recommendation(s): <br> Create new transit-supportive development requirements including coordination and provision of transit stop amenities and orientation of building entrances toward transit streets. |
| (6) In developing a bicycle and pedestrian circulation plan as required by 660-0120020(2)(d), local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses. | The TSP update will make recommendations to the bicycle and pedestrian plan that are consistent with TPR -0020. This TPR requirement is currently addressed in the following areas: <br> Walkways between cul-de-sacs and adjacent roads See response and recommendations related to cul-de-sacs, Section-0045(3)(b). <br> Walkways between buildings - See response and recommendations related to accessways, Section 0045(3)(b). <br> Access between adjacent uses - See response and recommendations related to accessways, Section 0045(3)(b). <br> Recommendation(s): <br> Require "crosswalks" (walkways) through parking areas over a certain size. <br> Pedestrian access to transit corridors should be provided without having to pass through parking lots for all commercial/institutional developments, as well as multifamily. <br> Require non-motorized connection through cul-desacs. <br> Institute block length standards for new streets, subdivisions, and PUDs. |


|  | Lo |
| :---: | :---: |
| (7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total ROW consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Notwithstanding section (1) or (3) of this rule, local street standards adopted to meet this requirement need not be adopted as land use regulations. | Street standards are located in Title 18 Engineering Design Standards, specifically in Chapter 18.15 (Transportation Facilities). Standard residential street pavement and ROW widths from Table 3-1 in CBMC 18.15.010(2) are listed below. <br> Adopted standards are wider than the recommended widths illustrated in the Transportation Growth Management Neighborhood Street Design Guidelines (listed below). <br> Recommendation(s): <br> Provide options allowing for minimized pavement in street design standards. Ensure that existing street design standards in the Code are consistent with the updated TSP. |
| OAR 660-12-0060 |  |
| (1) If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule... <br> (2) If a local government determines that there would be a significant effect, then the local government must ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted TSP through one or a combination of the remedies listed in (a) through (e) below, | Comprehensive Plan Amendments and Zone Changes are addressed in Chapter 17.360. Consistency with the TSP is not specifically provisioned; however, CBMC 17.30.040 requires that all applications for amendments and zone changes include an analysis of the potential cumulative effects of the proposal and the effects on public services, including streets. CBMC 17.360.060 states the approval criteria for Type III and IV review includes that the proposed amendments are consistent with the policies of the comprehensive plan and do not result in a decreased level of service for facilities and services identified in the capital improvement plan(s). <br> Recommendation(s): <br> Existing code language generally complies with this requirement. It is recommended that consistency with TPR Section -0060 be added as a specific approval criterion in CBMC 17.360.060. |

```
TPR Requirement
test in subsection (2)(e) of this section or qualifies for partial mitigation in section (11) of this rule...
```


## Local Development Code Reference

## Transportation System Plan

$\mathrm{N} \in \mathrm{B}$ 。
VOLUME 2

Technical Memorandum \#12:
Code Provisions and Ordinance Amendments

## TECHNICAL MEMORANDUM \#12 AMENDMENT

Code Provisions and Ordinance Amendments Memorandum (Task 9.2) - Coos Bay

Date: March 13, 2020
To: Project Management Team, City of Coos Bay TSP Update
From: Darci Rudzinski, Shayna Rehberg, and Courtney Simms, Angelo Planning Group
Angela Rogge, PE, David Evans and Associates, Inc.
Subject: Cities of Coos Bay and North Bend Transportation System Plan Updates Amendment

## Introduction

This memorandum presents proposed regulatory amendments to implement the updated City of Coos Bay Transportation System Plan (TSP). Specifically, it identifies recommended modifications to the Coos Bay Municipal Code to ensure that regulatory requirements are consistent with and implement the updated TSP and are consistent with the requirements of the Oregon Transportation Planning Rule (OAR 660-012, the "TPR"). Transportation policy areas, transportation standards, and TPR compliance were discussed in detail in Technical Memorandum \#11.

## Transportation Standards <br> Development Code Standards

The City's development regulations will need to be consistent with updated transportation standards. In addition, the TPR specifies requirements related to local TSP implementation. This section provides a summary of proposed modifications related to the consistency of the Coos Bay Municipal Code (CBMC) with the draft TSP and TPR requirements. Additional concepts for potential code modifications have emerged during the TSP update process; these are also addressed in this section.

An evaluation of Title 17 (Coos Bay Development Code) and Title 18 (Engineering Design Standards) ${ }^{1}$ found that City requirements are largely consistent with the TPR. ${ }^{2}$ However, the evaluation did identify a few opportunities for the City to both implement the TSP and better achieve and strengthen consistency with the TPR; Table 1 is a summary of those recommendations. ${ }^{3}$ Proposed modifications to specific code language are provided in Attachment A, Recommended Development Ordinance Amendments.

Table 1. Summary of Code Recommendations

|  | Code Section | Recommendation | Citation |
| :---: | :---: | :---: | :---: |
| 1 | 17.240, 17.250 | Expand the purpose and intent statements in key land use districts in the city, such as the Waterfront Heritage District, to refer to safe and secure travel as referenced in TSP goals and objectives. | City recommendation |
| 2 | 17.235 | Address right-of-way dedications necessary to provide sufficient right-of-way in the development standards for the Industrial-Commercial District. | City recommendation |
| 3 | 17.240 | Reconcile trip analysis requirements for the Waterfront Heritage District with traffic impact analysis requirements in the Engineering Design Standards. | City recommendation |
| 4 | $\begin{aligned} & 17.245 \text { and } \\ & 17.250 \end{aligned}$ | Establish provisions for pedestrian access to the waterfront and along the waterfront (e.g., boardwalk opportunities) in the Waterfront Industrial District and Hollering Place District. | City recommendation |
| 5 | 17.330.020 | Allow for redevelopment of parking areas for transit uses (e.g., park-and-rides) as new provisions in CBDC 17.330.020 (Joint use of facilities). Require development to provide park-and-rides per location and design guidance in the Coos County Transit Master Plan. | TPR -0045(4)(e), City recommendation |
| 6 | 17.330.030 | Include preferential location provisions for rideshare (e.g., carpool) parking in a new subsection in parking design standards | TPR -0045(4)(d) |
| 7 | 17.330.030 | Require "crosswalks" (pedestrian connections) through parking areas over a certain size in a new parking area design subsection in CBDC 17.330.030. | TPR -0045(3)(d) and (6) |
| 8 | 17.330.030 | Add bicycle parking requirements for transit transfer stations and park-and-ride lots in Table 17.330.030 (the location and design of spaces to be determined through development review). | TPR -0045(3)(a), City recommendation |

${ }^{1}$ Title 17 and Title 18 of the City of Coos Bay Municipal Code, available at:
https://www.codepublishing.com/OR/CoosBay/
${ }^{2}$ The full code evaluation is found in Attachment B of Technical Memorandum \#11, Draft Policies and Standards (Task 9.1) - Coos Bay.
${ }^{3}$ Table 1 Items 18-20 were added in response to additional code amendments requested by City staff and included in the project scope of work in February 2020. These items were also added to the "Administration and Housekeeping" list in Technical Memorandum \#11.

|  | Code Section | Recommendation | Citation |
| :---: | :---: | :---: | :---: |
| 9 | 17.335.090 | Require pedestrian access to the street (sidewalk), adjacent properties, and existing and planned transit stops for development other than single-family residential development. | City recommendation, TPR -0045(3)(d) and (6) |
| 10 | 17.335.090 | Establish requirements related to transit stops, including required building entrance orientation, for development other than single-family residential development in a new subsection in CBDC Chapter 17.335 (Supplementary Development Standards). | TPR -0045(3)(d) and (6) |
| 11 | 17.335.100 | Add transit facilities requirements to the Supplementary Development Standards in Title 17. | TPR -0045(3)(d) and (6) |
| 12 | 17.360.060 | Add consistency with TPR Section -0060 as a specific approval criterion for plan amendments and zone changes in CBDC 17.360.060. | TPR -0045(2)(g) and 0060 |
| 13 | 18.15.005 | Ensure that mobility standards in the code are consistent with recommendations in the Draft TSP. | TPR -0045(2)(b) |
| 14 | 18.15.010 | Institute block size standards according to street functional classification in a new subsection in CBMC Chapter 18.15 (Transportation Facilities). | TPR -0045(3)(d) and (6) |
| 15 | 18.15.010 | Consider narrower paved widths standards, as compared to existing standards in Table 3-1 in CBMC 18.15.010(2). | TPR -0045(7) |
| 16 | 18.15.010 | Ensure that requirements are consistent with spacing standards (updated, or existing 2004 TSP Tables 3-6 and <br> $3-7)$. Add access spacing standards in the code. | $\begin{aligned} & \text { TPR -0045(2)(a) - } \\ & 0045(7) \end{aligned}$ |
| 17 | 18.15.010 | Add requirements for non-motorized connections from cul-de-sacs to CBMC 18.15.10(9). | TPR -0045(3)(d) and (6) and -0045(2)(a) |
| 18 | 17.362, 17.367 | Address vision clearance area requirements. Clearvision area requirements are found in 18.15.010(6)(b). No modifications are recommended to Chapter 18, but cross-references to street standards in 18.15 are recommended to be included in the City's PUD and subdivision standards. | City recommendation |
| 19 | 17.330.030 | Review parking standards. A proposed new section, Parking Stall Design and Minimum Dimensions, includes requirements for off-street parking. | City recommendation |
| 20 | 17.235, 17.240 | Require easement dedication for access along Front Street. The alignment for the planned Coos Waterfront Walkway traverses land zoned Industrial-Commercial Waterfront-Heritage. Requirements for right-of-way easements are proposed for these zones. | City recommendation |

## Attachment A: Recommended Code Amendments

The following Coos Bay Municipal Code modifications are numbered to correspond to recommendations in Table 1. Recommended changes are in an adoption-ready format; text that is recommended to be added is shown as underlined, and text recommended to be removed is shown in strikeout.

## Recommendation 1

Expand the purpose and intent statements in key land use districts in the city, such as the Waterfront Heritage District, to refer to safe and secure travel as referenced in TSP goals and objectives.

## Chapter 17.230 Commercial Districts ( C and Mx ) <br> 17.230.010 Purpose.

(1) Commercial (C) District. These commercial areas are intended to provide for the regular shopping and service needs for the community and adjacent service areas. Typical allowed uses include convenience food markets, beauty and barber shops, bakeries and service industries. These areas are held to a high standard of site plan review due to the close proximity of residential zones. Development activity shall meet, as applicable, the design guidelines contained in this code and ensure that there is safe, interconnected, and multimodal transportation access to and within development sites.
(2) The mixed-use (MX) district requires mixed-use developments to provide the community with a mix of mutually supporting retail, service, office and medium- or high-density residential uses. The zone is designed to promote cohesive site planning and design that integrates and interconnects two or more land uses into a development that is mutually supportive. It can provide incentives to develop a higher density, active, urban environment than generally would be found in a suburban community. This type of development is further expected to:
(a) Achieve the goals and objectives of the city's comprehensive plan and capital facilities plans;
(b) Enhance livability, environmental quality and economic vitality;
(c) Maximize efficient use of public facilities and services;
(d) Create a safe, attractive and convenient environment for a variety of uses including living, working, recreating and traveling by all transportation modes.

## Chapter 17.240 Waterfront Heritage District (WH)

17.240.010 Intent.

The WH district is created to achieve the following objectives:
(1) To diversify the local economy.
(2) To preserve the city's historical waterfront and guide private and public development in a direction that strengthens a relationship to that setting.
(3) To guide the construction of private and public improvements to evoke historic architectural styles which existed in the Coos Bay area between the 1870s and the 1920s.
(4) To provide for a mix of uses and improvements that include:
(a) Existing waterfront industrial uses;
(b) New water-oriented, water-related and non-water-related service businesses;
(c) Amenities and attractions which encourage public access to and enjoyment of the waterfront;
(d) Urban residential opportunities; and
(e) Non-water-dependent industrial uses.
(5) To provide an opportunity to reclaim the city's waterfront heritage and express pride in our past and present by redevelopment which evokes, but does not necessarily duplicate, the appearance of the early days of Euro-American settlement.
(6) To promote physical, cultural and commercial links among Front Street, the boardwalk and the downtown core area.
(7) To ensure that there is safe, interconnected, and multimodal transportation access to and within development sites.

## (8) To accommodate Pedestrian connectivity to and along the Coos Bay waterfront.

## ...

## Chapter 17.250 Hollering Place District (HP)

### 17.250.010 Intent.

The area encompassed by the Hollering Place zoning district is intended to be developed as a planned unit development (PUD) based on the guidelines and requirements outlined below and the Hollering Place master plan. A cohesive design celebrating historic seaside architecture, reclamation of native shoreline habitats, sustainability, interpretation of local history and reconnection to the water are unifying elements relevant to the zoning district.

Development on the site must complement and connect with the existing business district to the east and act as a catalyst to help spur additional development and investment in the Empire area. A smallscaled gateway development near the intersection of Newmark Avenue and Empire Boulevard should act as a connection to the existing business district and as an entry statement signaling the presence of the remainder of the project. Preserving and enhancing views is a key component and must be balanced
with achieving the right development mix and ensuring safe, secure, and multimodal access for people and vehicles. The myriad of weather and environmental factors is also significant, as is making sure the new development is complementary to adjacent uses.

The master plan referred to herein was prepared not as a detailed requirement, but as an example of the uses, property organization and development, site design, and architectural form and composition that can meet the intent of this code.

## ...

## Recommendation 2

Address right-of-way dedications necessary to provide sufficient right-of-way in the development standards for the Industrial-Commercial District.

## Chapter 17.235 Industrial-Commercial District (I-C) <br> 17.235.040 Industrial-Commercial Development Standards.

Developments in the I-C zoning district shall be designed and constructed in accordance with the following standards:

## ...

(12) Electromagnetic Interference. Electric fields and magnetic fields shall not be created that adversely affect the normal operation of equipment or instruments or normal radio, telephone, or television reception from off the premises where the activity is conducted. This section does not apply to telecommunication facilities which are regulated by the Federal Communications Commission under the Federal Telecommunications Act of 1996 or its successor.

## (13) Sufficient right-of-way shall be dedicated to ensure space necessary for freight access, as

 determined by the street functional classification and right-of-way standards in CBMC 18.15.010(2) Table 3-1.
## Recommendation 3

Reconcile trip analysis requirements for the Waterfront Heritage District with traffic impact analysis requirements in the Engineering Design Standards.

## Chapter 17.240 Waterfront Heritage District (WH) <br> 17.240.070 Property Development Requirements.

(16) Trip Analysis. For the purposes of this section, a "trip analysis" is a study or report consistent with methods described in CBMC Section 18.40 .010 that specifies the ADT (average daily traffic) for a use.
(a) Prior to approval of any use, or the expansion of a use, in the area comprised of subdistrict WH-3 and the portion of subdistricts WH-1 and WH-2 lying east of Front Street, it is necessary to ensure that the cumulative ADT generated in this area only, by existing uses and the proposed use, does not exceed a total 8,000 ADT.
(b) The applicant must complete a trip analysis for development or re-development of 20 or more residential units or 20,000 s.f. or more of commercial or industrial development or as required by the Director. The trip analysis must conform to the demonstrating the change in the current ADT due to the proposal and compute the cumulative ADT-methods described within CBMC 18.40.010using one of the following methods:
(i) Retain a professional engineer with expertise in traffic or transportation engineering;
(ii) Trip generation figures for similar uses based on the latest edition of the publication "Trip Generation" by the Institute of Transportation Engineers (ITE Manual); of
(iii) Compute the average daily trips using a minimum of three sites with the same type and size of activity as proposed.
(c) The director may require a particular computation method upon determining that the development may have a substantial impact on the average daily trips to ensure the most reliable projections of impacts will be obtained.
(d든 A copy of the analysis and cumulative figures shall be sent to the Oregon Department of Transportation, Region 3, which will have 10 days to respond to the city in writing before approval may be granted.
(ed) The 8,000-ADT limitation for the area shall be removed or modified only in accordance with OAR 660-012-0060.

## Recommendation 4

Establish provisions for pedestrian access to the waterfront and along the waterfront (e.g., boardwalk opportunities) in the Waterfront Industrial District and Hollering Place District.

## Chapter 17.245 Waterfront Industrial District (W-I)

17.245.030 Property Development Requirements.

## ...

(9) Noise. Maximum permissible noise level shall not exceed permitted levels measured at the appropriate measuring points established by the Oregon Department of Environmental Quality. If there is doubt that the proposed use will violate these standards or if a valid complaint has been registered about the level of noise, the owner or agent may be required to show written compliance with state regulations.
(10) Pedestrian Circulation. Pedestrian connectivity to and along the waterfront shall be provided throughout the project pursuant to CBDC 17.330.030 and 17.335.090.

## Chapter 17.250 Hollering Place District (HP) <br> 17.250.080 Site Design, Guidelines and Standards.

All development in the HP district shall be consistent with the intent of the Hollering Place master plan and shall be consistent with the site design, guidelines and standards listed in this section, and the Hollering Place Master Plan Section 6 specifications for Vehicle Circulation, Parking, Pedestrian Circulation, Internal Circulation, Site Design elements and Landscaping. Site design shall respond to environmental, cultural and historic site features by taking advantage of existing view corridors, land use patterns, landforms, prevailing winds, and water-related activities. Long-term sustainable practices should be a focus, including marine resource protection, restoration of native plant communities, and habitat enhancement.
(1) Vehicle Circulation. The existing street patterns, access points and rights-of-way off of Empire Boulevard shall remain. The primary entry point to the lower development will be from Newmark Avenue with a secondary access along Mill Street off of Michigan Avenue. Access to existing businesses and uses will remain, but will be modified to support on-street parking. Existing access to the boat ramp and parking lot shall remain. Parking along Holland Avenue, the south property line of the subject property, shall remain as boat ramp parking.
(2) Pedestrian Circulation. Pedestrian connectivity is required for new development consistent with CBDC 17.330.030 and 17.335.090. and continuity be provided throughout the project with clear erosswalks, curb cuts that meet code, and adequate lighting. Provide high-quality site furnishings suitable for coastal environments with long life and low maintenance.

### 17.250.090 General Design Guidelines and Standards - Architectural Form and Composition.

Establish visual linkages between the Empire business district and development on the bluff along Empire Boulevard, the various development areas on the lower site, views to the bay, and potential future development on adjacent sites. Design and locate buildings to minimize the effects of undesirable bay winds at ground level. The following design guidelines and standards are provided for all development in the HP zoning district:
(1) Respond to public streets and public spaces. Along pedestrian routes, design development to encourage use by pedestrians by providing a safe, comfortable, and interesting walking environment consistent with building design building design requirements of Sections 17.250 .090 (2) and (3).

## Recommendation 5

Allow for redevelopment of parking areas for transit uses as new provisions in CBDC 17.330 .030 (Joint use of facilities). Require development to provide park-and-rides per guidance in the Coos County Transit Master Plan.

### 17.330.020 Joint Use of Facilities.

Joint parking and/or loading facilities serving two or more uses, structures, or parcels of land may be approved to satisfy the requirements of both facilities, provided the owners or operators of the uses, structures, or parcels show that their operations and parking needs do not overlap in point of time. If the uses, structures, or parcels are under separate ownership, the right to joint use of the parking space must be evidenced by a deed, lease, contract, or other appropriate written document to establish the joint use. [Ord. 503 § 1 (Exh. B), 2018; Ord. 473 § 3 (Exh. A), 2016. Formerly 17.340.020].

Parking spaces and parking areas may be used for transit related uses such as transit stops and park-and-ride/rideshare areas, provided minimum parking space and design requirements for the site can still be met. Development required to provide park-and-rides shall be consistent with the location and design specifications of the Coos County transit master plan.

## Recommendation 6

Include preferential location provisions for rideshare (e.g., carpool) parking in a new subsection in parking design standards

Chapter 17.330 Off-Street Parking and Loading Requirements
17.330.030 Parking Design Standards.
...
(2) Location. Off-street parking facilities shall be located on site to the extent feasible. Off-site parking shall be no further than 300 feet from the site, measured from the nearest point of the parking facility to the nearest point of the nearest building that the facility is required to serve. Off-site parking shall be primarily employee parking.

Parking areas that have designated employee parking and more than 20 automobile parking spaces shall provide at least $10 \%$ of the employee parking spaces (minimum two spaces) as preferential carpool and vanpool parking spaces. Preferential carpool and vanpool parking spaces shall be closer to the employee entrance of the building than other parking spaces, with the exception of ADA-accessible parking spaces.

## Recommendation 7

Require "crosswalks" (pedestrian connections) through parking areas over a certain size in a new parking area design subsection in CBDC 17.330.030.

### 17.330.030 Parking Design Standards

...
(3) Materials, Design, and Lighting.
(a) Off-street parking facilities shall be surfaced with a durable and dustless surface, shall be graded and drained so as to dispose of surface water to the satisfaction of the public works department and shall be maintained in good condition, free of weeds, dust, trash, and debris.
(b) Except for a single-family or duplex dwelling, groups of more than two parking spaces per lot must:
(i) Provide aisles or turnaround areas so that all vehicles may enter the street in a forward manner; and
(ii) Serve a driveway designed and constructed to facilitate the flow of traffic on and off the site, with due regard to pedestrian and vehicle safety, and shall be clearly and permanently marked and defined. In no case shall two-way and one-way driveways be less than 20 feet and 12 feet, respectively, and arranged so as not to use any part of adjoining public sidewalks, street, or alley rights-of-way, except for ingress and egress.
(iii) Provide internal pedestrian connections in parking lots with more than ten (10) parking spaces located in commercial districts and in parking lots with more than thirty (30) parking spaces located in non-commercial districts. These connections shall be a minimum of five (5) feet wide and distinguished from vehicular areas through changes in elevation or contrasting paving materials (such as light-color concrete inlay between asphalt). Paint or thermo-plastic striping and similar types of non-permanent applications may be approved for crossings of parking lot areas that do not exceed 24 feet in crossing length.
(iv) Provide at-grade pedestrian lighting-level of no less than two footcandles.

## Recommendation $8^{4}$

Add bicycle parking requirements for transit transfer stations and park-and-ride lots in Table 17.330.030 (the number and design of spaces to be determined through development review).

### 17.330.030 Parking Design Standards.

(4) All uses, except for single-family dwellings and duplexes, required to provide off-street vehicle parking shall provide bicycle parking consistent with the standards in Table 17.330.030(B).

Table 17.330.030(B) - Bicycle Parking

| Type of Use | Number of Bicycle Parking Spaces |
| :--- | :--- |
| Multifamily residential | One space per dwelling unit |
| Commercial | One space per use plus one space per 50-15 vehicle <br> parking spaces |
| Industrial, institutional and public uses | Schools - One space per 1025 students <br> Transit Stops - Two spaces |
| Transit Centers - Four spaces or one per 10 vehicle <br> spaces, whichever is greater |  |
| Other uses - One space per use plus one space per |  |
| 10 vehicle parking spaces |  |

(a) Bicycle parking space may be located within garage, storage shed, basement, utility room or similar area.
(b) Bicycle Parking Location. Bicycle parking shall be located in lighted, secure locations within 50 feet of the main entrance to a building, but not further from the entrance than the closest general-purpose automobile parking space. Where a building has multiple entrances, required
${ }^{4}$ Table name was updated since Technical Memo \#12 original draft to include (B), as Recommendation \#19 added a table to Subsection 17.330.030, prompting renaming of original table 17.330.030- Bicycle Parking.
bicycle parking shall be no farther than 50 feet from an entrance. Bicycle parking shall be located and designed so as to not impede or create a hazard to pedestrians (at least 36 inches between bicycles and other obstructions or buildings).
(c) Bicycle Parking for Transit. The location and design of bicycle parking for transit stops and transit centers shall be determined through the development review process.

## Recommendation 9

Require pedestrian access to the street (sidewalk), adjacent properties, and existing and planned transit stops for development other than single-family residential development.

## Chapter 17.335 Supplementary Development Standards

Sections:
17.335.010 Generally.
17.335.020 Height of fences and hedges.
17.335.030 Solid waste.
17.335.040 Lighting.
17.335.050 Noise.
17.335.060 Landscaping.
17.335.070 Drive-ins/drive-throughs.
17.335.080 Indoor marijuana-related businesses.
17.335.090 Pedestrian and Bicycle Access.
17.335.100 Transit Facilities.

### 17.335.090 Pedestrian and Bicycle Access.

Pathways within developments shall provide safe, reasonably direct and convenient connections between primary entrances and all adjacent streets, adjacent properties, and existing or planned transit stops based on the following definitions:
(1) Reasonably Direct. A route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.
(2) Safe and Convenient. Bicycle and pedestrian routes that are reasonably free from hazards and provide a reasonably direct route of travel between destinations.
(3) For commercial, industrial, mixed use, public, and institutional buildings, the "primary entrance" is the main public entrance to the building. In the case where no public entrance exists, street connections shall be provided to the main employee entrance.
(4) For residential buildings the "primary entrance" is the front door (i.e., facing the street).
(5) For multifamily buildings in which each unit does not have its own exterior entrance, the "primary entrance" may be a lobby, courtyard or breezeway which serves as a common entrance for more than one dwelling.
(6) Pathways shall be concrete, asphalt, brick/masonry pavers, or another city-approved durable surface meeting ADA requirements.

## Recommendation 10

Establish requirements related to transit stops, including required building entrance orientation, for development other than single-family residential development in a new subsection in CBDC Chapter 17.335 (Supplementary Development Standards).

### 17.335.090 Pedestrian and Bicycle Access.

...
(5) Retail, office, and institutional developments proposed on the same site as, or adjacent to, an existing or planned transit stop as designated in an adopted transportation or transit plan shall provide the following transit access:
(a) Reasonably direct pedestrian connections between the transit stop and primary entrances of the buildings on site. For the purpose of this Section, "reasonably direct" means a route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-ofdirection travel for users.
(b) The primary entrance of the building closest to the street where the transit stop is located that is oriented to that street.
(c) Easements and/or transit stop improvements in coordination with the transit service provider and consistent with an adopted plan, pursuant to CBDC 17.335.100.

## Recommendation 11

Add transit facilities requirements to the Supplementary Development Standards in Title 17.

### 17.335.100 Transit Facilities.

Developers shall coordinate and provide documentation of coordination with Coos County Area Transit, the local transit provider, with regard to the design of the street and other transportation facilities that are located within 100 feet of existing or planned transit routes and stops and of development sites that are adjacent to existing or planned transit stops. ADA-accessible transit stop improvements, pedestrian connections to transit stop locations, and furnishings such as shelters, benches, bicycle racks, and/or other amenities may be required by public works, consistent with adopted plans.

## Recommendation 12

Add consistency with TPR Section -0060 as a specific approval criterion for plan amendments and zone changes in CBDC 17.360.060.

Chapter 17.360 Plan Amendments and Zone Changes
17.360.060 Approval Criteria.
(1) With a Type III-or Type IV review, the city council shall approve the proposal upon finding that:
(a) The proposed amendment is consistent with the applicable policies of the comprehensive plan or that a significant change in circumstances requires an amendment to the plan or map;
(b) The proposed amendment is in the public interest; and
(c) Approval of the amendment will not result in a decrease in the level of service for capital facilities and services identified in the-Coos Bay capitalimprovement plan(s)-;
(d) The proposed amendment is consistent with the City of Coos Bay's planned transportation system as described within the Transportation System Plan;
(e) The proposed amendment is consistent with the adopted transportation system plan and would facilitate the planned function, capacity, and performance standards of the impacted facility or facilities; and
(f) The proposed amendment shall be consistent with the Oregon Administrative Rule (OAR) 660-012-0060 requirements. Where it is found that a proposed amendment would have a significant effect on a transportation facility in consultation with the applicable roadway authority, the City shall work with the roadway authority and applicant to modify the amendment request or mitigate the impacts in accordance with the TPR and applicable law.

## Recommendation 13

Ensure that mobility standards in the code are consistent with recommendations in the Draft TSP.

## Chapter 18.15 Transportation Facilities

### 18.15.005 Generally.

Level of Service (LOS). The level of service standard to determine what is acceptable or unacceptable traffic flow on streets shall be based on average seconds of delay a volume-to-capacity ratio. City streets shall maintain a LOS of "D" during the peak 15 minutes of the day p.m. peak hour of the day. However, the developer will be responsible for making appropriate safety improvements should warrants for turn lanes, traffic signals, and/or other traffic safety improvements be met.

## Recommendation 14

Institute block size standards according to street functional classification in a new subsection in CBMC Chapter 18.15 (Transportation Facilities).

### 18.15.010 City Streets.

(1) Street Classifications. The city has adopted the following functional classification of streets based on the context of the surrounding land use:
(a) Principal arterial (state highway under ODOT jurisdiction);
(b) Arterial street;
(c) Collector street;
(d) Neighborhood route;
(e) Local street.

Refer to the city's transportation system plan (TSP) for a map showing the city's functional classification street designations.

## (2) Block Length and Perimeter.

(a) The maximum block length shall not exceed 600 feet between street corner lines in residential and commercial districts, 400 feet in the downtown zone, and 1,000 feet in other zones unless it is adjacent to an arterial street or unless the topography or the location of adjoining streets design exception pursuant to CBMC Section 18.10.060.
(b) The minimum length of blocks along an arterial in zones other than Residential, downtown, and CMX is 1,800 feet.

## (c) A block shall have sufficient width to provide for two tiers of building sites unless topography or

 location of adjoining streets justifies an exception.(32) Vehicular Zone.
[Note: This new re-numbering will need to be carried through this subsection.]

## Recommendation 15

Consider narrower paved widths standards, as compared to existing standards in Table 3-1 in CBMC 18.15.010(2).

### 18.15.010 City Streets.

(2) Vehicular Zone.
(a)(i) Vehicular Zone Cross-Section. The vehicular zone width is defined as the horizontal distance from face of curb to face of curb, measured perpendicular to the centerline. The vehicular zone includes paved travel lanes for motorized vehicles and bicycles, and may also include median spaces and paved areas for on-street parking. The width of the vehicular zone shall be sufficient to allow for the safe passage of normal multi-modal traffic and emergency vehicles.

Required lane widths and configuration are shown in the standard details. Streets should be centered within the right-of-way; however, design exceptions may be considered due to topography or other physical constraints. The city's design exception process in CBMC 18.10 .060 will apply; including the Director's discretion to deviate from minimum Right - of - way width standards.

Table 3-1. Lane Widths and Configuration in the Vehicular Zone

|  | Minimum Paving Width Curb-to-Curb |  |  |  |  |  | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Type of Street |  | Vehicle Travel Lane | Median or Center Turn Lane | OnStreet Parking | Bike Lane <br> (a) | Sidewalk <br> Curb (b) |  |
| Arterial/Collector (c) |  |  |  |  |  |  |  |
| 5-lane (c)(d) | 100' | 12'/11' | 12'14' | - | $\begin{gathered} 2 @ \\ 6^{\prime}(\mathrm{g}) \underline{(h)} \end{gathered}$ | 2 @ 6'/5' | 10\%8\% |
| 3-lane (c)(d) | 76' | 12'11' | $\frac{12 ' 14 '}{\text { (Optional) }}$ | - | $\begin{gathered} 2 @ \\ 6^{\prime}(\mathrm{g})(\mathrm{h}) \end{gathered}$ | 2 @ 6’/5' | 10\%8\% |
| 2-lane | 50' | 12'11' | - | - | $\begin{gathered} 2 @ \\ 6^{\prime}(\mathrm{g})(\mathrm{h}) \end{gathered}$ | 2 @ 6'/5' | 10\% 8 |


| Local Roads |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20' Residential (no parking) | $\begin{array}{r} 50^{\prime} \\ 40^{\prime} \\ \hline \end{array}$ | 10' |  | - |  | 2 @ 5 | 10\% |
| 28' 28' Standard Residential (parking one side) | $\begin{aligned} & 50^{\prime} \\ & \underline{48^{\prime}} \end{aligned}$ | 10' |  | 1 @ 8' |  | 2 @ 5 | 10\% |
| 36' 34' Neighborhood-Residential (parking both sides) | $\begin{aligned} & 50^{\prime} \\ & \underline{54} \end{aligned}$ | 10' | - | 2 @ 8ㄱ | - | 2 @ 5 | 10\% $16 \%$ |
| 40' Standard Commercial | 60' | 12' | - | 2 @ 8' | - | 2 @ ${ }^{\prime}$ | 10\%16\% |
| Dead End (d)(e) | 50' | 10' | - | 2 @ 8' | - | 2 @ ${ }^{\prime}$ | 10\%16\% |
| Cul-de-Sac (e)(f) | $50^{\prime}$ | 10' | - | (d)(e) | - | $\begin{aligned} & 1 \text { @ 5' } \\ & (f)(\mathrm{g}) \end{aligned}$ | $\frac{10 \% 16 \%}{(\mathrm{~d})(\mathrm{e})}$ |
| Alley |  |  |  |  |  |  |  |
| 1-way | 20' | 12' | - | - | - | - | - |
| 2-way | $20^{\prime}$ | 16' | - | - | - | - | - |

(aA) New construction: six feet; reconstruction: five feet.
(bB) Wider sidewalks may be required in commercial areas.
(c) On designated freight routes the minimum lane width is $12^{\prime}$.
(dG) The minimum right-of-way width includes the option of two six-foot-wide landscape strips for arterials or two four-foot-wide strips for local commercial/industrial.
(e®) A dead end must be less than 400 feet in length and terminate with a circular or hammerhead turnaround with a maximum grade of eight percent.
(fE) No parking is permitted at the end of a cul-de-sac which must have adequate space for emergency equipment turnaround, usually a 45 -foot unobstructed radius.
(gF) At the end of the cul-de-sac, a five-foot sidewalk is required along the perimeter adjacent to the development.
( $\mathrm{h} \in$ ) Bike lanes allowed to be reduced to five feet in width if the project is reconstruction.
....
Table 3-6. Maximum Street Grades

| Street Classification | Maximum Grade (\%) |
| :--- | :--- |
| Residential Local | $12 \underline{10}$ |


| Arterial/Collector | 10 |
| :--- | :--- |
| Commercial/Industrial_Lecat | 10 |
| Arteriat | 8 |

## Recommendation 16

Ensure that requirements are consistent with spacing standards (updated, or existing 2004 TSP Tables 36 and 3-7). Add access spacing standards in the code.

### 18.15.010 City Streets.

...
(6) Roadway Intersections.
(a) Minimum Access spacing for City Streets. Minimum access spacing for city streets are found in Table 3-7.

## Table 3-7. Minimum Access Spacing

| Type of Street |  |
| :--- | :--- |
| Arterial Streets | Between new access points: 500 feet |
| Collector Streets | Between new access points: 300 feet |
| Arterial-arterial intersections | From the intersection: 300 feet |
| Arterial-Collector intersections | From the intersection: 300 feet |
| Collector-Collector intersections | From the intersection: 150 feet |
| State Highways or County Roads | ODOT or county standards supersede city standards |
| Local Roads | To be determined in the development review process. |

(a) For City facilities, existing developed or undeveloped lots or parcels cannot be denied access. The maximum access spacing possible should be provided unless it renders access to individual lots or parcels impractical.
(a)(b) Intersection Geometry.

## [Note: Subsequent tables and subsections will need to be re-numbered accordingly.]

## Recommendation 17

Add requirements for non-motorized connections from cul-de-sacs to CBMC 18.15.10(9).

### 18.15.010 City Streets.

... (9) Cul-de-Sacs. Dead-end streets over 150 feet in length shall terminate in an approved turnaround acceptable to the fire marshal and public works to provide adequate emergency vehicle access. The maximum length of a dead-end street shall be 400 feet unless approved through the design exception process (see CBMC 18.10.060). This length shall be measured from the centerline of the intersecting street along the centerline of the dead end street to the center of the turnaround.

No islands or other obstructions are allowed in the centers of cul-de-sacs.
The entire cul-de-sac or hammerhead must be contained within the public right-of-way and signed appropriately to restrict parking. Refer to subsection (2)(f) of this section for information regarding sign installation responsibilities.

The cul-de-sac shall provide a location where pedestrian and bicycle access to adjacent areas can be achieved. This will be determined by the review authority as a part of the subdivision review in conformance with CBDC Section 17.335.090 (4).

## Recommendation 18

Resolve any conflicts between clear-vision area requirements and updated TSP standards. Add references to transportation standards requirements for subdivisions and planned unit development in Title 17.

## Chapter 17.362 Planned Unit Development

17.362.040 PROPERTY DEVELOPMENT REQUIREMENTS.
(4) Access and Roads.
(a) The development shall provide vehicular and pedestrian access from a dedicated and improved street according to applicable zoning district standards and engineering requirements in 18.15.
(b) Private streets within the development shall meet the following minimum paving standards:
(i) Eighteen feet where no on-street parking is allowed.
(ii) Twenty-eight feet where on-street parking is allowed only on one side of the right-ofway.
(iii) Thirty-six feet where parking is permitted on both sides of the right-of-way.
(iv) All private streets within a PUD shall be designed and constructed to city standards.
(v) An additional three feet on each side of pavement shall be designated as right-ofway area in which no construction shall take place.
(vi) The review authority shall approve the names of all streets within the PUD. The owner or operator of the development shall furnish, install, and maintain street signs of a type approved by the review authority.

## Chapter 17.367 Subdivisions

### 17.367.040 APPROVAL CRITERIA FOR A PRELIMINARY PLAT.

(1) The review authority shall approve a preliminary plat if he or she finds:
(a) The applicant has sustained the burden of proving that the application complies with the applicable provisions of this title and Title 18.15, Transportation Facilities;
(b) The application will comply with all applicable regulations by satisfying all adopted conditions of approval; or that necessary adjustments, exceptions, modifications or variations have been approved or are required to be approved before the final partition is approved; and
(c) The subdivision makes appropriate provision for potable water supplies and for disposal of sanitary wastes.

## Recommendation 19

Add angled parking standards to existing parking dimensional standards.
Chapter 17.330 Off-Street Parking and Loading Requirements
17.330.030 PARKING DESIGN STANDARDS.
(1) Size of Parking Space. Each off-street parking space shall not be less than nine feet by 18 feet. Up to 25 percent of all required parking spaces can be used for compact vehicles. These compact spaces shall not be less than eight feet by 16 feet. Each space shall be provided with adequate ingress and egress.
(a) Parking Stall Design and Minimum Dimensions. Where a new off-street parking area is proposed, or an existing off-street parking area is proposed for expansion, the entire parking area shall be improved in conformance with the CBDC. At a minimum the parking spaces and drive aisles shall be paved with asphalt, concrete, or other City-approved materials, provided the Americans with Disabilities Act requirements are met, and shall conform to the minimum dimensions in Table 17.330.030(A) and Figure 17.330.030. All off-street parking areas shall contain wheel stops, perimeter curbing, bollards, or other edging as required to prevent vehicles from damaging buildings or encroaching into walkways, landscapes, or the public right-of-way.

| Parking <br> Angle <br> $\leq 0$ | Curb <br> Length | Stall Depth |  | Aisle Width |  | Bay Width |  | Stripe <br> Length |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\frac{\text { Single }}{\text { (D1) }}$ | Double <br> D2 | One <br> Way <br> A1 | $\begin{aligned} & \frac{\text { Two }}{\text { Way }} \\ & \underline{\text { A2 }} \end{aligned}$ | One Way <br> B1 | $\begin{aligned} & \begin{array}{l} \text { Two } \\ \underline{\text { Way }} \\ \underline{B 2} \end{array} \end{aligned}$ |  |
| $\underline{90}$ | 8'-6" | 18' | 36' | 23' | 23' | 59' | 59' | 18' |
| $\underline{60}$ | 10' | 20' | 40' | $\underline{17}$ | 18' | 57' | 58' | 23' |
| $\underline{45^{\circ}}$ | 12' | 18'-6" | 37' | $\underline{13}$ | $\underline{18}$ | 50' | 55' | $\underline{26 '-6 "}$ |
| $30^{\circ}$ | $\underline{17}$ | 16'-6" | 33' | 12' | 18' | 45' | 51' | 32'-8" |
| $\underline{0}$ | 22' | 8'-6" | $\underline{17}$ | 12' | 18' | $\underline{29}$ | 35' | 8'-6" |

Figure 17.330.030 - Parking Stall Design and Minimum Dimensions


90 Degree Parking


0 Degree Paraing


## Recommendation 20

Include requirements for easement dedication for access along Front Street.

Chapter 17.235 INDUSTRIAL-COMMERCIAL DISTRICT (I-C)

### 17.235.040 INDUSTRIAL-COMMERCIAL DEVELOPMENT STANDARDS.

(7) Pedestrian Access Plan. An on-site pedestrian circulation system must be provided, which connects the street to the public entrances of the structure(s) on site.
(a) The circulation system shall be hard-surfaced and be at least five feet wide.
(b) Where the system crosses driveways, parking, and/or loading areas, the system must be clearly identifiable through the use of elevation changes, speed bumps, varied paving materials or
other similar methods approved by the reviewing authority and in compliance with the Americans with Disabilities Act (ADA).
(c) The on-site pedestrian circulation system and parking areas must be lighted to a level which provides adequate lighting so that parking areas can be used safely when natural light is not present.
(d) The pedestrian system must connect the site to adjacent streets and transit stops. The pedestrian system must also connect on-site public open space or parks, commercial, office and institutional developments to adjacent like uses and developments for all buildings set back 45 feet or farther from the street lot line, when existing development does not preclude such connection. Development patterns must not preclude eventual site-to-site connections, even if an adjoining site is not planned for development at the time of the applicant's development.
(e) Land to accommodate the planned Coos Waterfront Walkway alignment, as shown in Figure 12 of the TSP and described in the Tier 2 TSP Project list, shall be provided through either existing right-of-way, right-of-way that is created and dedicated to the City, or easements dedicated through development approval. Minimum boardwalk right-of-way width shall be 14 feet.

## Chapter 17.240 WATERFRONT HERITAGE DISTRICT (WH)

### 17.240.070 PROPERTY DEVELOPMENT REQUIREMENTS.

(18) Land to accommodate the planned Coos Waterfront Walkway alignment, as shown in Figure 12 of the TSP and described in the Tier 2 TSP Project list, shall be provided through either existing right-ofway, right-of-way that is created and dedicated to the City, or easements dedicated through development approval. Minimum boardwalk right-of-way width shall be 14 feet.



[^0]:    Planning Advisory Committee Meetings

    Public Workshops

[^1]:    Process will result in separate TSPs for each community

[^2]:    Process will result in separate TSPs for each community

[^3]:    ${ }^{1}$ ODOT Access Management Standards - OHP Appendix C Revisions to Address Senate Bill 264 (2011): http://www.oregon.gov/ODOT/TD/TP/docs/ohp am/apdxc.pdf

[^4]:    ${ }^{2}$ The seven goals are Goal 1 - Mobility and Accessibility; Goal 2 - Management of the System; Goal 3 - Economic Vitality; Goal 4 - Sustainability; Goal 5 - Safety and Security; Goal 6 - Funding the Transportation System; and Goal 7 - Coordination, Communication, and Cooperation.

[^5]:    ${ }^{3}$ OR 540 is a district highway from mile point -0.05 to 2.24 in North Bend and from mile point 4.49 to 10.94 in Coos Bay.
    ${ }^{4}$ Highway 241 briefly enters the Coos Bay UGB (which delineates the study area); however, it is a Coos Bay facility for this section and the OHP standards do not apply.

[^6]:    ${ }^{5}$ https://www.oregon.gov/ODOT/Planning/Documents/Seismic-Lifelines-Evaluation-Vulnerability-SyntheseIdentification.pdf

[^7]:    ${ }^{6}$ https://www.oregon.gov/ODOT/Pages/HB2017.aspx.
    ${ }^{7}$ https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=245662

[^8]:    ${ }^{8}$ Coos County Airport District Staff reports that current conditions at the Airport include: a runway guidance system for the primary runway (4/22), but not the secondary runway (13/31); designated cargo locations on the airfield (FedEx and UPS); an extended primary runway (4/22), but not secondary runway; and T-Hangars and a large 30,000 square foot hangar.

[^9]:    ${ }^{9}$ Local agencies have the choice of using AASHTO's A Policy on Geometric Design of Highways and Streets - 2011 or ODOT 3R Urban design standards. Local Agencies may use AASHTO for Vertical Clearance requirements on Local Agency Jurisdiction Roads.

[^10]:    ${ }^{10}$ Indian reservations and transit receive their own funding and are not eligible for inclusion on this list.

[^11]:    ${ }^{11}$ Note that the TSP update project will verify whether these projects have been completed.
    ${ }^{12}$ A 2018 Transportation Growth Management grant has been secured for the creation of a Coos Countr Area Transit Transportation Master Plan. https://www.oregon.gov/LCD/TGM/docs/Grants/2018-TGM-Awards.pdf

[^12]:    ${ }^{13}$ Connectivity requirements and access spacing standards are largely absent from the CBDC. To ensure consistency with the updated TSP and to support its implementation, recommended amendments to subdivision and site plan requirements will likely include standards for local street connectivity, maximum block sizes/spacing between streets, and accessways through large blocks.

[^13]:    ${ }^{14}$ Note that as part of the proposed amendments scheduled to be completed by end of September 2018, City Staff is recommending that Type II application be removed from this requirement. A pre-application is not necessary for this level of review.

[^14]:    ${ }^{15}$ Full service was restored to the 135 -mile Coos Bay Rail Line in 2013. Additional funds have been acquired to rehabilitate nine tunnels and repair the Coos Bay Rail Bridge.

[^15]:    ${ }^{16}$ Note that the TSP is considered a Functional Plan, providing detailed planning and development guidelines for transportation planning. Pursuant to the Comprehensive Plan "( $w$ )hile the Comprehensive Plan will be the guiding plan document, it is expected that all special or functional plans will conform to, or be consistent with the Comprehensive Plan."

[^16]:    ${ }^{17}$ The NBCC does not include requirements for notification to transportation facility or service providers, where proposals may have impacts on their facilities or services. To ensure consistency with the updated TSP and support future coordination between the city, county, state and transit provider, recommended amendments to application review and hearing procedures (NBCC 18.60.040) to include notice requirements are a possible outcome of this TSP update.
    ${ }^{18}$ Subdivision, zoning, and transportation facilities requirements in the CBDC do not refer to the Local Street Connectivity Plan in the 2004 North Bend TSP.

[^17]:    ${ }^{19}$ Note that the timeframe for noticing the Department of Land Conservation and Development of proposed text and plan amendments was changed to at least 35 days before the first evidentiary hearing. NBCC 18.84 .020 will need to be updated to reflect this change.
    ${ }^{20}$ https://www.oregon.gov/ODOT/Engineering/Pages/Standards.aspx
    ${ }^{21}$ https://www.oregon.gov/ODOT/Engineering/Pages/Traffic-Roadway.aspx

[^18]:    22 http://www.northbendoregon.us/urbanrenewal/page/urban-renewal-plan

[^19]:    ${ }^{23}$ Harborwalk Esplanade completed in part in 2010 as North Bend Boardwalk.
    ${ }^{24}$ North Bend Ordinance 2020;
    https://www.northbendoregon.us/sites/default/files/fileattachments/planning commission/meeting/7601/amd 3-17 staff report attachments final.pdf

[^20]:    ${ }^{25}$ https://www.oregon.gov/deq/Programs/Pages/Jordan-Cove.aspx

[^21]:    ${ }^{1}$ The adopted Coos Bay Goal \#1 has the following additional action item: Potential Urban Growth Boundary areas (e.g., Bunker Hill area) will be integrated into the city system plan to provide adequate service.

[^22]:    ${ }^{2}$ Current adopted TSP policies have an implementation focus, rather than plan development focus. The recommendation is to update the cities' policies at the implementation phase of the project.

[^23]:    ${ }^{1}$ https://www.oregon.gov/ODOT/Pages/HB2017.aspx
    ${ }^{2}$ Oregon Department of Transportation. Highway Revenue Apportionment Forecasts. https://www.oregon.gov/ODOT/Data/Pages/Revenue-Forecasts.aspx

[^24]:    ${ }^{1}$ North Bend Comprehensive Plan Article 13.7.100 - Land Use Classifications delineates six general land use classifications: industrial, commercial, low-density residential, high-density residential, Parks / Open Spaces. The Comprehensive Plan is not entirely consistent with the Comprehensive Plan statement that the classifications are illustrated on the official Comprehensive Plan Land Use Map and the official Zone Map.
    ${ }^{2}$ Coos County Airport District Southwest Oregon Regional Airport Master Plan Update, 2013.

[^25]:    ${ }^{3}$ One exception is a largely developed area south of Ocean Boulevard, between N 19th Street and W. Hills Boulevard, which includes Ocean Ridge Assisted Living. This facility and some limited commercial lots on Ocean Boulevard have a Comprehensive Plan designation of High-density Residential and are zoned Mixed-Use. Also, note that areas designated Commercial along Southwest Boulevard/W. Lockhart Avenue in the southeastern corner of the City are zoned Industrial-Commercial and Trust Land near the Pony Creek Reservoir is designated industrial on the Comprehensive Plan map.

[^26]:    ${ }^{4}$ The City has developed a master plan for this area: North Point Area Master Plan, May 2017.

[^27]:    ${ }^{5}$ Information from the American Community Survey (2012-2016); mapped by census block group, which may include multiple neighborhoods.

[^28]:    ${ }^{6}$ http://www.co.coos.or.us/Departments/RoadDepartment.aspx

[^29]:    :- $\cdots$ Urban Growth Boundary (UGB)

    - State Freight Route
    - Railroad
    - Highway Over-Dimension Load Pinch Point
    

    Data Sources:
    Cities of North Bend and Coos Bay
    Oregon Department of Transportation (ODOT),
    Oregon Geospatial Enterprise Office,
    ESRI ArcGIS Online

[^30]:    ${ }^{7}$ These programs may not be applicable to North Bend or Coos Bay, but are noted here for informational purposes only.

[^31]:    ${ }^{8}$ Coos County Airport District Master Plan
    ${ }^{9}$ Bureau of Transportation Statistics. North Bend/Coos Bay, OR: Southwest Oregon Regional (OTH). https://www.transtats.bts.gov/airports.asp?pn=1\&Airport=OTH\&Airport Name=North\%20Bend/Coos\%20Bay,\%20 OR:\%20Southwest\%200regon\%20Regional\&carrier=FACTS
    ${ }^{10}$ Oregon International Port of Coos Bay. Maritime Commerce. https://www.portofcoosbay.com/maritimecommerce/
    ${ }^{11}$ Oregon International Port of Coos Bay. 2015 Strategic Business Plan. https://static1.squarespace.com/static/569e6f1176d99c4f392858c4/t/58b489d89f74562a52de8425/1488226796 269/Strategic+Business+Plan+web.pdf
    ${ }^{12}$ https://www.portofcoosbay.com/about-the-railroad/

[^32]:    ${ }^{13} 2011$ Coos County Transportation System Plan
    ${ }^{14}$ https://www.nwnatural.com/Business/Safety/PipelineLocationInformation

[^33]:    ${ }^{14}$ http://heritagedata.prd.state.or.us/historic/
    ${ }^{15}$ Section $4(f)$ specifies that FHWA cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there are no existing feasible and prudent alternatives to the use of the land and the proposed action includes all possible planning to minimize harm to the property.
    ${ }^{16}$ Under Section 6(f), it is prohibited to convert property acquired or developed with Land and Water Conservation Fund Act (LWCF) grant money to non-recreational purposes without approval from the National Park Service (NPS).

[^34]:    ${ }^{1}$ Oregon Department of Transportation. Analysis Procedures Manual Version 2, Chapter 14. (2018). https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf

[^35]:    ${ }^{2}$ Coos County Airport District Master Plan

[^36]:    ${ }^{3}$ https://cooscountyairportdistrict.com/airport-receives-federal-grants-for-airfield-improvements/
    ${ }^{4}$ Federal Railroad Administration Office of Safety and Analysis. Annual WBAPS 2018. Oct. 2018.

[^37]:    ${ }^{5}$ Oregon International Port of Coos Bay. Maritime Commerce. https://www.portofcoosbay.com/maritimecommerce/

[^38]:    ${ }^{6}$ National Pipeline Mapping System Public Map Viewer, https://pvnpms.phmsa.dot.gov/PublicViewer/, Pipeline and Hazardous Materials Safety Administration, 2018.

[^39]:    ${ }^{[1]}$ ODOT Analysis Procedure Manual Version 2, Section 4.3.5, p. 4-37, 2018.

[^40]:    ${ }^{[2]}$ Highway Safety Manual 4-58

[^41]:    ** Crash data shown in the SPIS group report results from the summation of crash data between the begin and end mile points of the Group.
    **ADT, SPIS Score, and Percent data shown in the SPIS group report are the highest values from all sites within the Group.

[^42]:    ${ }^{* *}$ Crash data shown in the SPIS group report results from the summation of crash data between the begin and end mile points of the Group.
    **ADT, SPIS Score, and Percent data shown in the SPIS group report are the highest values from all sites within the Group.

[^43]:    ${ }^{1}$ https://www.pdx.edu/prc/home

[^44]:    ${ }^{2}$ Oregon International Port of Coos Bay Strategic Business Plan, 2015.
    ${ }^{3}$ Per phone conversation with the Port of Coos Bay, January 2019.
    ${ }^{4}$ https://www.portofcoosbay.com/channel-deepening

[^45]:    Draft System Alternatives

[^46]:    Draft System Alternatives

[^47]:    Draft System Alternatives

[^48]:    Draft System Alternatives

[^49]:    ${ }^{1}$ Infrastructure Grant Applicant Resource Tool (ODOT Safe Routes to School): https://geo.maps.arcgis.com/apps/webappviewer/index.html?id=33d00a3d7181433d85abfce78b8ae879

[^50]:    ${ }^{2}$ Infrastructure Grant Applicant Resource Tool (ODOT Safe Routes to School): https://geo.maps.arcgis.com/apps/webappviewer/index.html?id=33d00a3d7181433d85abfce78b8ae879

[^51]:    ${ }^{1}$ https://www.oregon.gov/odot/projects/pages/project-details.aspx?project=PAB33870

[^52]:    ${ }^{2}$ Oregon Administrative Rules (OAR) 660-012-0045 and 660-012-0060
    ${ }^{3}$ Note that several items identified in Task 9.1 of the project Statement of Work directly relate to TPR compliance.
    ${ }^{4}$ Title 17 and Title 18 of the City of Coos Bay Municipal Code (CBMC), available at: https://www.codepublishing.com/OR/CoosBay/

[^53]:    ${ }^{5}$ Current adopted TSP policies have an implementation focus, rather than plan development focus. The recommendation is to update the cities' policies at the implementation phase of the project.

