Coos Bay Pavement Overlay Schedule

Post-it® Fax Note 7671	Date 9/17	# of pages ▶ 6
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Capitol Street Improvements

Overlay Projects

Revised

March 2001

City of Coos Bay

CAPITAL STREET IMPROVEMENTS

The City of Coos Bay has approximately 60 miles of paved streets in town and at 1996 dollars it would cost approximately $6,842,880 to overlay every street. Though this is not feasible, the City since 1954 has had serial levies up to the 1990/1991 fiscal year (except for a couple of years between levies) to overlay streets. The levies brought in any where from $100,000 to $150,000 per year for the overlays. Approximately $100,000 will overlay one mile of street at thirty-six feet wide. Fortunately the City had the insight to recognize that asphalt streets do not last forever and provided a means to maintain those streets. Unfortunately the citizens felt that enough taxes had been levied against them and voted that last levy down.

Life expectancy of streets is usually twenty years, of course several factors must be taken into account including traffic volume, type of original construction, location of the street in relation to fill or natural ground, and weight of traffic using the street. If streets can be overlaid within that twenty years then the cost is significantly reduced. The cost to overlay a street is 1/4 the cost as compared to complete rehabilitation. If the City had to do this to all of paved streets it would cost somewhere around 27 million dollars.

During rehabilitation the street is totally dug up and the asphalt and gravel subbase is removed. Once a street begins to "alligator" water is able to penetrate the asphalt and causes the subbase to begin to break up. The subbase gets water into it and becomes very soft and unsupportive for traffic, this causes a pumping action as the base oozes up through the asphalt leaving brown marks as it dries. Not all alligatoring or broken pavement needs to be ripped up and repair to the base necessary, if caught in time an overlay with minimum subbase repairs can be made or even a crack seal will eliminate the problem to hold the street until an overlay can be completed. Since the last serial levy the City has been doing more crack sealing to get maximum time from the streets. Crack sealing is done by using a petroleum base tar like substance in a liquid form to apply from a machine made for that purpose.

Pavement life is measured in accumulated traffic loads. If two streets are equal in condition, the one with the higher traffic count should be overlaid first. The end of its life is coming sooner and it will benefit more people. In the past the City has attempted to group streets geographically each year to minimize travel time (mobilization) for the contractor, thus maximizing the benefit derived from fixed funds.

By continuing the patching and crack sealing programs, the City is preserving some integrity of the streets, but patching is not the same as an overlay.

The graphs attached are illustrating pavement data and the relation of not having serial levies or at least money budgeted to help continue the overlay program. Next is a list of streets that need to be overlaid within the next two years, streets that need to be overlaid in the two to five years and streets that fall into the five to ten-year cycle.

The overlays listed here are based on a two-inch lift at a cost of $45.00 per ton. Street overlays in the past several years have come in around $35.00 to $37.00 per ton. Ten years ago the price was $31.00 or $32.00 dollars per ton. The $45 was used to insure that the overlay costs will not be to low and the unknown cost of petroleum products in the future. The more asphalt tonnage the better price the City receives.

0 to 2 years

Street	From/To	Tons	Cost
Marple St.	Schetter to Taylor	895	$ 40,275
Taylor	Marple to Wasson	247	$ 11,115
LaClair	Newmark to Ocean Blvd.	751	$ 33,795
S. 10th St.	Ingersoll to Lockhart	435	$ 19,575
S. Broadway	Lockhart to Slough	277	$ 12,465
Johnson Ave.	7th to 10th St.	325	$ 14,625
S. 11th St.	Ingersoll to Ferguson	627	$ 28,215
Ingersoll Ave.	4th to 7th	304	$ 13,680
Pennsylvania Ave.	Southwest Blvd. to 17th	437	$ 19,665
Wasson St.	Newmark to Michigan	370	$ 16,650
Anderson Ave.	11th to City limits	350	$ 15,750
Radar Rd.	Compass Circle to Fulton	701	$ 31,545
Yew	Koos Bay Blvd. to east	80	$ 3,600
S. 7th St.	Kruse to Lockhart	290	$ 13,050
Kruse Ave.	5th to 7th	184	$ 8,280
E St.	6th to 14th	674	$ 30,330
N. 3rd St.	Market to Highland	86	$ 3,870
N 10th St.	Central to 8th Terrace	461	$ 20,745
9th Ave.	D to H	587	$ 26,415
10th Ave.	E to F	144	$ 6,400
Applewood Dr.	16th to east	238	$ 10,710
I St	14th to 17th	216	$ 9,720
D St.	Coos River Highway to Harborview	144	$ 6,400
Jackson	1st to Merchant	50	$ 2,250
Brule	Ocean Blvd. to Lindberg	216	$ 9,720
Michigan	Morrison to Madison	249	$ 11,205
Newmark	Ocean to west college entrance	1,100	$ 49,500
	TOTAL		**$469,680**

Downtown URA Streets
Empire URA Streets
Jurisdictional Exchange Streets

2 to 5 years

Street	From/To	Tons	Cost
Norman	Ocean to Newmark	708	$ 31,860
S. 5th St.	Lockhart to Ingersoll	698	$ 31,410
Lincoln	100' east of Oakway to West Hills	221	$ 9,945
Alder	Bayshore to Front	75	$ 3,375
Park	4th ct. to Telegraph	228	$ 10,260
E. Telegraph	Park to Date	533	$ 23,985
Date	7th Rd. to east end	382	$ 17,190
N. 12th St.	Central to 12th Terrace (upper level)	158	$ 7,110
4th St.	Commercial to Anderson	358	$ 16,110
Prefontaine	Fulton to Kentucky	331	$ 14,895
N. 15th St.	Nutwood to Myrtle	75	$ 3,375
N. 14th St.	Juniper to W. Park Rd.	274	$ 12,330
W. Park Rd.	N 14th to Cedar	466	$ 20,970
N 12th St.	Commercial to 12th Terr. (lower level)	79	$ 3,555
S. 4th St.	Lockhart to Johnson	698	$ 31,410
S. 4th St.	Elrod to Golden	433	$ 19,485
S. 8th St.	Central to Curtis	295	$ 13,275
S. 9th St.	Central to Curtis	336	$ 15,120
Donnelly Ave.	4th to 7th	244	$ 10,980
Ferguson Ave.	7th to 11th	321	$ 14,445
Market Ave.	2nd to 4th	243	$ 10,935
N. 5th St.	Commercial to Market	115	$ 5,175
11th Ave.	E to F	144	$ 6,480
8th Ave.	E to D	144	$ 6,480
10th Ave.	E to D	144	$ 6,480
Bayview Dr.	16th to east	173	$ 7,785
17th Ave.	Evergreen to I St.	408	$ 18,360
Canyon Dr.	9th to east	198	$ 8,910
Coos River Highway	I St. to D St.	888	$ 39,960
2nd Ave.	B St. to E St.	699	$ 31,455
E St.	2nd to 6th	315	$ 14,175
D St.	4th to 6th	293	$ 13,185
1st. Ave.	A to D	440	$ 19,800
Merchant	D to Jackson	86	$ 3,870
Ocean Blvd.	Central to Newmark	11,581	$521,145
Central Ave.	Ocean to west	144	$ 6,480
Wallace Ave.	Ocean to Newmark	338	$ 15,120
Fulton Ave.	Radar to Blanco	523	$ 23,535
Kentucky Ave.	Prefontaine to 100' west of Tricia Pl.	367	$ 13,515
Morrison St.	Newmark to Michigan	271	$ 12,195
N. CammannSt.	Newmark to Taylor	1,358	$ 61,110
	TOTAL		**$1,157,235**

5 to 10 years

Street	From/To	Tons	Cost
Woodland Dr.	Myrtle to City limits	1,435	$ 64,575
N. 15th	Myrtle to Kingwood	230	$ 10,350
Kingwood	17th to west	205	$ 9,225
Redwood	8th to 11th	143	$ 6,435
Juniper	N. 14th to N. 15th	180	$ 8,100
S. 4th	Golden to Johnson	1,012	$ 45,540
N. 9th	Date to south end	340	$ 15,300
S. 5th	Anderson to Donnelly	287	$ 12,915
12th ave.	E to F	144	$ 6,480
Cedar Dr.	16th to east	204	$ 9,180
Cedar Ave.	10th st. to west	127	$ 5,715
N. 7th	Koosbay Blvd. to Kingwood	208	$ 9,360
S. 7th	Ingersoll to Johnson	276	$ 12,420
N. 6th	Koosbay Blvd. to Ivy	287	$ 12,915
Pine Dr.	Koosbay Blvd. to 13th	84	$ 3,780
N. 13th	Pine Dr. north & south	210	$ 9,450
Yew Ave.	Koosbay Blvd. to 14th	206	$ 9,270
Curtis Ave.	Broadway to 4th	295	$ 13,275
Bennett Ave.	4th to 7th	265	$ 11,925
S. 2nd	Curtis to Elrod	228	$ 10,260
N. 8th	Hemlock to Koosbay Blvd.	222	$ 9,990
Ocean Ct.	Butler to 19th	357	$ 16,065
Coos River Highway	6th to east City limits	1,380	$ 62,100
7th ave.	E to F	144	$ 6,480
Merrill	Ocean Blvd. to Lindberg	341	$ 15,345
Lindberg	Brule to Merrill	240	$ 10,800
Dunn	Lindberg to Ocean	295	$ 13,275
Schoneman	Newmark to Flanagan	667	$ 30,015
S. Cammann	Montgomery to south end	979	$ 44,055
S. Marple	Newmark to Pacific	1,103	$ 49,635
Crocker	St. John to south end	1,121	$ 50,445
Ferguson	11th to 12th	78	$ 3,510
12th st.	Ferguson to 12th ct.	136	$ 6,120
S. 2nd	Kruse to Lockhart	322	$ 14,490
Morrison	Michigan to Pacific	758	$ 34,110
Maryland	Madison to Schoneman	408	$ 18,360
South 19th	California to Idaho	312	$ 14,040
	TOTAL		**$685,305**

The following list of streets are to be monitored on a yearly basis to determine structural integrity and wear. They could be upgraded to any of the above categories if deemed necessary.

Street	From/To	Tons	Cost
Southwest Blvd.	Washington to City Limits	1,621	$ 72,960
N. 8th	Redwood to Nutwood	511	$ 22,995
Pacific	Morrison to Schoneman	214	$ 9,630
Flanagan	Schoneman to Morrison	206	$ 9,270
Montgomery	west & east 1 blk. of Morrison	293	$ 13,185
Michigan	Schoneman to Woolridge	218	$ 9,810
N. 14th	Myrtle to Teakwood	737	$ 33,165
N. 11th	Central to Highland	236	$ 10,620
Minnesota	Southwest Blvd. to 14th	444	$ 19,980
H st.	6th to 9th	246	$ 11,070
5th ave.	D to E	138	$ 6,210
N. 19th	Thompson to south	313	$ 14,085
S. Wall	Pacific to Fulton	499	$ 22,455
Fulton	Empire Blvd. to Cammann	480	$ 21,600
Wisconsin	Empire Blvd. to Cameron Rd.	192	$ 8,640
Schoneman	Newmark to Harris	528	$ 23,760
Oregon	Southwest Blvd to 15th St.	493	$ 22,185
	TOTAL		**$331,605**

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Tech Memo #1 Final

DKS Associates

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Technical Memorandum #1

Date: October 23, 2003

To: Coos Bay / North Bend TSP – TAC/CAC Members, Aaron Geisler – City of North Bend, Laura Barron, Shanda Shribbs – City of Coos Bay, Ingrid J. Weisenbach – ODOT/TGM

From: Carl D. Springer, P.E. – DKS Associates; Tom Armstrong – Winterbrook Planning

RE: **Background Documents Review and Preliminary Goals & Policies**

This is the first in a series of memorandums that presents technical findings and recommendations for the Coos Bay / North Bend Transportation System Plan project. The purpose of these memorandums is to provide Technical Advisory Committee (TAC) and Citizen Advisory Committee (CAC) members with a progress report on current planning activities. Feedback from the TAC and CAC members on these technical memorandums will be incorporated into subsequent analysis and the actual TSP report chapters.

Background Plan and Document Review

We have reviewed a series of past plans, studies and city ordinances that were distributed to us at the kick-off meeting held at the City of Coos Bay offices on August 5, 2002. This background review is useful throughout the Transportation System Plan (TSP) project, but initially it gives the project team a basis for identifying preliminary goals & policies for the TSP.

The list of documents is attached separately along with an indication of the TSP stage where it will be most useful, and which of the regional agencies is most affected by it. The local studies with the greatest relevance to the Coos Bay / North Bend TSP process include:

- The *Bay Area Transportation Study* (1995),
- The *Downtown Coos Bay Circulation and Parking Study* (1997), and
- The *Coos County TSP* (1999).

Other reports addressing specific area master plans or feasibility studies will be considered through the process, as appropriate, but the land development and travel forecasts done in conjunction with the TSP generally will supercede these studies. Traffic Impact Studies will be incorporated into the existing conditions description (Task 3). City ordinances for Coos Bay and North Bend will be reviewed to explicitly identity areas requiring amendments to comply with Oregon Transportation Planning Rule requirements. A topical review is presented in a separate memo for Coos County, Coos Bay and North Bend. The specific text and nature of the code amendments will be developed at a later stage (Task 6) of the TSP, but at this point it is useful to flag the general topics for inclusion and discussion during the overall process.

Preliminary Goals and Policies

The goals and guiding principals presented in the *BATS Final Report* were reviewed and then re-organized into a conventional format for goals, policies and action items consistent with many Oregon jurisdictions. This new format better lends itself to adoption into local development code ordinances, and provides a basic framework for plan development.

Many of the items in the original BATS list, most notably under Street and Highways, resembled a check list of specific operational issues and possible improvement solutions. To the extent possible, these items were incorporated into the revised format. However, many of these suggestions will be tested as a part of the system analysis (Task 4) and recommended transportation system improvements (Task 6). If they are demonstrated to resolve identified existing or future deficiencies, they will be incorporated into the plan as a recommended system improvement rather than as a specific goal or policy item.

Additional goals and policies are suggested starting on the next page that extend beyond those listed in the BATS study. The added policy elements are based on adopted TSPs in other Oregon cities that responded to State TPR requirements. The purpose of this initial listing is to provide a basis for comments from TAC and CAC member, and to ensure that the local goals are adequately addressed. In many cases, placeholders [indicated by brackets] are shown. The specific of these policy or action items will be determined during this study process.

As for definition of the basic terms:

- The **goals** are brief guiding statements that describe a desired result.
- The **policies** describe the actions needed to move the community toward the goal.
- Below many of the policies, details of the implementing **actions** are listed that clarify the intent of the policy. Generally, the action statements refer specifically to facilities or services or planned projects *(most of these action items will be added at a later stage of the project)*.

The transportation goals and policies are implemented by these actions, by the improvement projects included in the forthcoming system master plans and action plans for each transportation mode, and by the respective city Development Code. The primary function of these goals and policies are to guide the City of Coos Bay and the City of North Bend twenty-year vision of transportation system needs.

It is anticipated that an additional document or modification to existing documents will be required to include construction standards for improvements identified in the TSP. Typically, these types of standards are found in the City Development Code and Engineering Design Manual and Standard Drawings. Street standards will be prepared as a part of this TSP process for both cities.

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

Policies:

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

Action:
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.

Potential Urban Growth Boundary areas (e.g., Bunker Hill area) will be integrated into the city system plan to provide adequate service.

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.

Policies:

a) Implement Coos Bay / North Bend's public street standards **[to be prepared during the study]** 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 **[relevant parts to be developed during study].**

c) Provide connectivity to each area of Coos Bay / North Bend 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 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 **[to be developed in this study].**

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 ***[to be developed as a part of this process]****.*

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.

Actions:
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 balanced 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 / North Bend), 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) **[Implement]** 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 **[selected funding mechanism]** as elements of an overall funding program to pay for adding capacity to the collector and arterial street system, and making safety improvements related to development impacts.

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.

Bibliography

No.	Type	Agency / Company	Title	Date	Potential TSP Issues					Affected Agency						
					Policy	Existing	Forecasts	Alternatives	Implementation	Coos Bay	Coos County	North Bend	NB Airport	ODOT	Port of Coos Bay	Curry County
1	Legislation	North Bend	1995 Comprehensive Land Use Plan: Plan Provisions and Policies	Nov-89	■				■			○				
2	Report	Benkendorf Associates	Airport Business Park Master Plan	Jan-99		□	□					○			○	
3	Memo	CH2M Hill	BATS - Airport Existing Conditions/ Deficiencies /Future Strategies	Jul-94		■	□	□	■	○	○	○	○	○	○	
4	Memo	Kittelson & Associates	BATS - Alternatives Analysis	Mar-95			□	■		○	○	○	○	○		
5	Memo	Kittelson & Associates	BATS - Existing Conditions / TM#1	Nov-94		■				○	○	○	○	○		
6	Memo	ETS Pacific	BATS - Existing Rail System	Aug-94		■				○	○	○	○	○		
7	Memo	CH2M Hill	BATS - Financial Analysis	Apr-95	■	■	□	□	■	○	○	○	○	○		
8	Memo	Kittelson & Associates	BATS - Future Conditions	Jan-95			□			○	○	○	○	○		
9	Memo	CH2M Hill	BATS - Population and Land Use Projections	Jan-95			□			○	○	○	○	○		
10	Memo	CH2M Hill	BATS - Port Existing Conditions/ Deficiencies /Future Strategies	Jun-94		■	□	□	■	○	○	○	○	○		
11	Memo	Kittelson & Associates	BATS - Travel Forecast Methods	Nov-94			□			○	○	○	○	○		
12	Report	David Evans and Assoc.	Bay Area Comprehensive Economic Analysis	Apr-98		□	□			○	○	○	○		○	
13	Report	CH2M Hill / Kittelson	Bay Area Transportation Study: Final Report	Dec-95	■	■	□	■	□	○	○	○	○	○	○	
14	Report	Gary L. Dyer	Bikeway Master Plan	Jun-91	■	■	■		■	○	○	○		○		
15	Report	Benkendorf Associates	Charleston Marina Five Point Program	Apr-92		□	□								○	
16	Report	Hobson & Associates	Charleston Shipyard Analysis / Port of Coos Bay	May-92		□	□								○	
17	Report	Kittelson & Associates	City of Coos Bay Downtown Parking and Circulation Study	Sep-97	■	■	□	■	■	○				○		
18	Report	Coos Bay	Comprehensive Plan 2000, Volume I: Plan Policy	Mar-81	□				■	○						
19	Report	Coos Bay	Comprehensive Plan 2000, Volume II: Transportation	Mar-81	□	■	□	□	■	○						
20	Report	JRH Transportation Engr.	Coos County Transportation System Plan	Sep-99	■	■	■	■	■	○	○	○	○	○	○	
21	Legislation	Coos County	Coos County TSP: Implementing Ordinances and Design Standards	Sep-99	■				■	○	○	○		○		
22	Report	David Evans and Assoc.	Coquille Indian Tribe / Coos Bay - Empire Property, North Parcels / TIS	Mar-00		■	□			○	○					
23	Report	David Evans and Assoc.	Coquille Indian Tribe / Transportation Plan	Apr-00		■	□			○	○	○		○		
24	Flyer	Coos County Area Transit	Dial-A-Ride Service Schedule	Jun-02		■	□		□	○	○	○	○	○		
25	Report	Benkendorf Associates	Eastside Development Strategy	Jul-96		■	□		□					○	○	
26	Memo	David Evans and Assoc.	Economic Opportunities Analysis / Demographic Inventory and Forecasts	Feb-98		□	□			○	○	○				
27	Report	The Portico Group	Feasibility Study for Coos Head Eco-Tourism Facilities	Jul-98		□	□				○				○	
28	Report	Carl H. Buttke, Inc.	Major Street Traffic Safety Program	Mar-81		□						○				
29	Report	CTS Engineers, Inc.	Newmark Avenue Improvement Plan	May-01		■	□			○						
30	Report	Benkendorf Associates	North Bay Marine Industrial Park Master Plan	Jul-99		□	□				○				○	
31	Report	McSwain & Woods	North Bend Downtown Waterfront Master Plan	Jan-98	■	■			□	○		○		○		
32	Legislation	North Bend	Ordinance No. 1084: Street Work Regulations	Mar-76	■				■			○				
33	Legislation	North Bend	Ordinance No. 1085: Public Improvement Methods	Feb-78	■				■			○				
34	Legislation	North Bend	Ordinance No. 1175: Land Subdivisions	Apr-95	■				■			○				
35	Legislation	North Bend	Ordinance No. 1192: Zoning Regulations	Jan-99	■				■			○				
36	Legislation	North Bend	Ordinance No. 1277: Planning Commission Duites	Feb-97	□				□			○				
37	Legislation	Coos Bay	Ordinance No. 93: Land Development	Jun-87	■					○						
A	Report	ODOT	Oregon Highway Plan	Mar-99	■			■	■	○	○	○	○	○	○	○
38	Report	W & H Pacific	Pacific Coast Scenic Byway	Dec-97	□	■	□	□	□	○	○	○		○		
39	Report	Satre Associates	Parks and Recreation Master Plan	Jul-99	□	■	■	■	□			○				
40	Report	ODOT	Proposed Oregon Coast Highway Corridor Master Plan	Jan-95	■	□	□		■	○	○	○		○		
41	Memo	David Evans and Assoc.	Regional Site Availability / Industrial and Commercial Available Land Use Inventory	Feb-98		□				○	○	○				
42	Report	Weslin Consulting Services	Transit Feasibility Study	Jul-99	□	■	■	□		○	○	○		○		○

No.	Type	Agency / Company	Title	Date	Potential TSP Issues					Affected Agency						
					Policy	Existing	Forecasts	Alternatives	Implementation	Coos Bay	Coos County	North Bend	NB Airport	ODOT	Port of Coos Bay	Curry County
B	Legislation	Land Conservation and Development Commission	Transportation Planning Rule (OAR 660-012-000 through -060)	Feb-00	■	■	■	■	■	○	○	○	○	○	○	○
43	Report	Oregon Downtown Development Association	The Coos Bay Resource Team Report	Oct-02	□			■	□	○						
44	Charette	Alpha Engineering, Inc.	Empire Waterfront Development Strategy	Apr-02	□			■	□	○						
Notes:					Notes:											
Numbered volumes in project reference box.					■	Significant Influence										
Lettered volumes in Library					□	Moderate Influence										
						Little or No Influence										

Traffic Count Memo

DKS Associates

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MEMORANDUM

TO: Laura Barron, City of Coos Bay
Dave Foster, City of North Bend
Ingrid J. Weisenbach, ODOT

FROM: Carl D. Springer, P.E.
Julie Sosnovske, P.E.

DATE: July 1, 2003

SUBJECT: Existing and Future Traffic Volumes P02221

This memorandum summarizes work performed by DKS Associates regarding existing traffic volumes and the development of future traffic volumes for the cities of Coos Bay and North Bend. This memorandum explains the process of developing future traffic volumes for use in determining future transportation needs.

EXISTING TRAFFIC COUNTS

Existing traffic counts were conducted at approximately 74 intersections in Coos Bay and North Bend in August, 2002. A tabulation of the intersections counted and their associated traffic counts is included as an attachment to this memorandum. Due to the Highway Capacity Manual[1] methodology used to calculate intersection level of service, traffic counts were adjusted at each intersection by multiplying the traffic counts for the peak 15 minute period by four to achieve a peak hour traffic volume. This peak hour traffic volume was used to calculate intersection level of service. This calculation and resulting peak hour intersection volume is included in the intersection tabulation attached to this memorandum.

ODOT requires that analysis be conducted on the 30th highest hour traffic volume. Based on data from the nearest ODOT permanent count recorder station (4.77 miles south of Coos Bay on US 101), the 30th highest hour would occur during the evening peak hour in either July or August. Since our counts were conducted during the evening peak period in August, no adjustment was deemed necessary to account for seasonal variation.

FUTURE DEMAND AND LAND USE

The Coos Bay and North Bend Transportation System Plan addresses existing system needs and additional facilities that are required to serve future growth. ODOT's TPAU (Transportation Planning and Analysis Unit) has developed a transportation forecast model which was used to determine future traffic volumes in Coos Bay and North Bend. This forecast model translates assumed land uses into person travel, selects modes, and assigns motor vehicles to the roadway network. These traffic volume projections form the basis for identifying potential roadway deficiencies and for evaluating alternative circulation improvements. This section describes the forecasting process including key assumptions and

[1] Highway Capacity Manual, Transportation Research Board, National Research Council, Washington D.C., 2000.

the land use scenario developed from the existing Comprehensive Plan designations and allowed densities.

Projected Land Uses

Land use is a key factor in developing a functional transportation system. The amount of land that is planned to be developed, the type of land uses, and how the land uses are mixed together have a direct relationship to expected demands on the transportation system. Understanding the amount and type of land use is critical to taking actions to maintain or enhance transportation system operation.

Projected land uses were developed for areas within the urban growth boundary and reflect the Comprehensive Plan and land use assumptions for the year 2020. Complete land use data sets were developed for the following conditions.

- Existing 2000 Conditions (base year model)
- Year 2020 Conditions

Land uses were inventoried throughout Coos Bay and North Bend by ODOT and reviewed by the respective cities. This land use database includes the number of dwelling units, the number of retail employees, and the number of other employees. Table 1 summarizes the land uses for base year 2000 conditions and the future year 2020 scenario within the Coos Bay and North Bend TSP study area. A detailed summary of the uses for each Transportation Analysis Zone (TAZ) within the Coos Bay and North Bend study area is provided in the Appendix.

Table 1
Coos Bay and North Bend Land Use Summary

Land Use	*2000*	*2020*	*Increase*	*20 Year Percent Increase*
Households	13,493	15,359	1,866	+14%
Employment	13,798	17,513	3,715	+27%
Population	32,348	36,409	4,061	+13%

At the existing level of land development, the transportation system generally operates without significant deficiencies in the study area (see Existing Conditions chapter). As land uses are changed in proportion to each other (i.e. there is a significant increase in retail employment relative to household growth), there will be a shift in the overall operation of the transportation system. Retail land uses generate higher amounts of trips per acre of land than households do and other land uses. The location and design of retail land uses in a community can greatly affect transportation system operation. Additionally, if a community is homogeneous in land use character (i.e. all employment or residential), the transportation system must support significant trips coming to or from the community rather than within the community. Typically, a mix of residential, commercial, and employment type land uses in the same community better enable some residents to work and shop locally, reducing the need for residents to travel long distances.

Table 1 indicates that moderate growth is expected in Coos Bay and North Bend in the coming decades. The transportation system in Coos Bay and North Bend should be monitored to make sure that land uses in the plan are balanced with transportation system capacity. This TSP balances needs with the forecasted 2020 land uses.

For transportation forecasting, the land use data is stratified into geographical areas called transportation analysis zones (TAZs), which represent the sources of vehicle trip generation. There are 98 TAZs within the Coos Bay and North Bend TSP study area. The model zone boundaries are shown in Figure 1.

Transportation Model

A determination of future traffic system needs in Coos Bay and North Bend requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City. The objective of the transportation planning process is to provide the information necessary for making decisions on when and where improvements should be made to the transportation system to meet travel demand as developed in an urban area travel demand model as part of the TSP process. ODOT uses EMME/2, a computer based program for transportation planning, to process the large amounts of data for local areas in Oregon.

Traffic forecasting can be divided into several distinct but integrated components that represent the logical sequence of travel behavior (Figure 2). These components and their general order in the traffic forecasting process are as follows:

- Trip Generation
- Trip Distribution
- Mode Choice
- Traffic Assignment

The initial roadway network used in the traffic model was the existing streets and roadways. Future 2020 land use scenarios were tested and roadway improvements were added to mitigate the impacts of motor vehicle traffic growth, using funded and planned improvements as a starting basis. In the case of Coos Bay and North Bend, the only funded or planned improvement is the widening of Newmark Avenue to three lanes between LaClair and Wallace. Forecasts of PM peak period traffic flows were produced for every major roadway segment within Coos Bay and North Bend. Traffic volumes were projected on all arterials and most collector streets. Some local streets were included in the model, but many are represented by centroid connectors in the model process. Centroid connectors represent groups of land use which load onto the street network in relatively the same location.

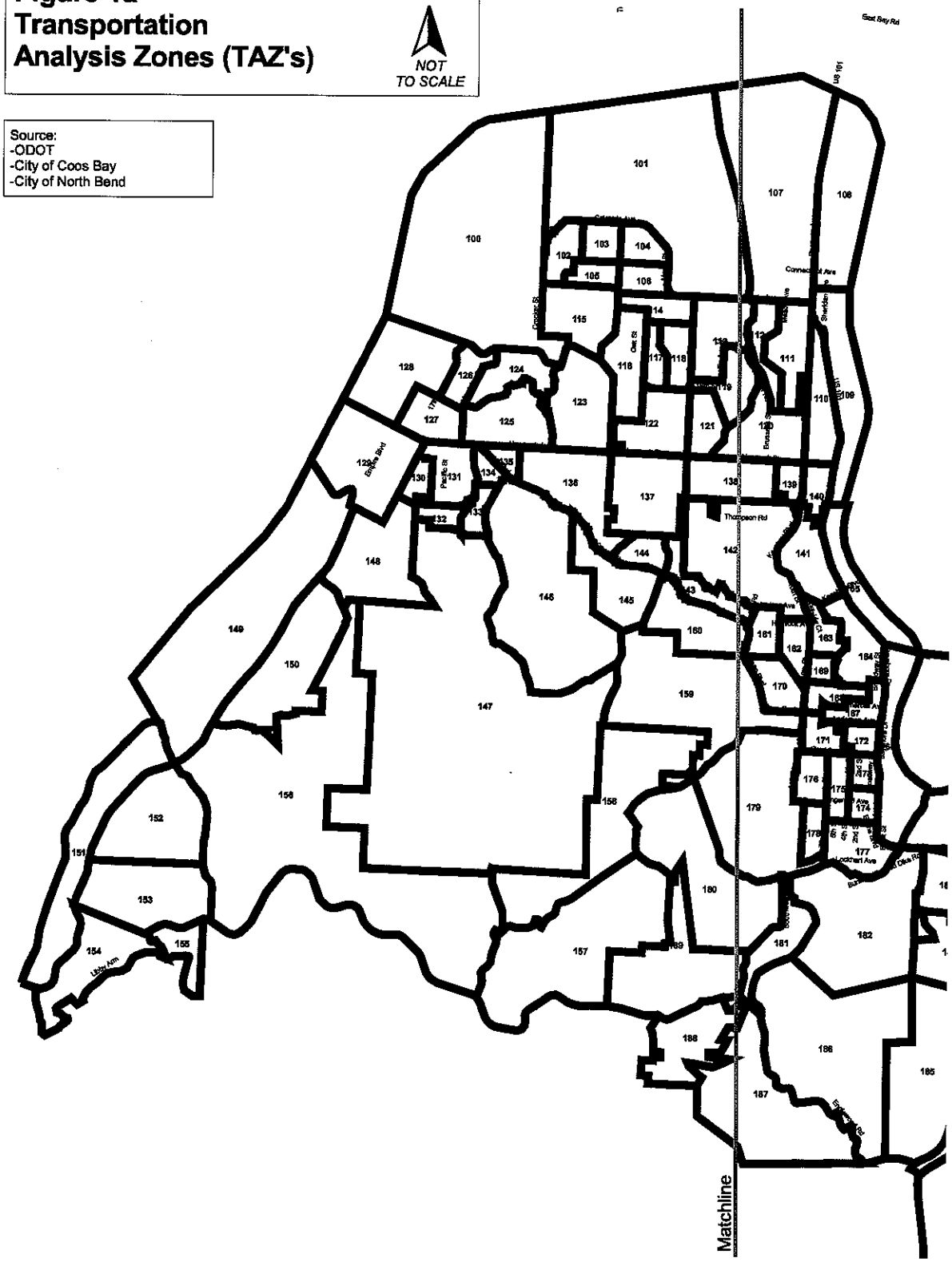
DKS *Associates*

Cities of Coos Bay/North Bend
Transportation System Plan

Figure 1a
Transportation
Analysis Zones (TAZ's)

N
NOT TO SCALE

Source:
-ODOT
-City of Coos Bay
-City of North Bend



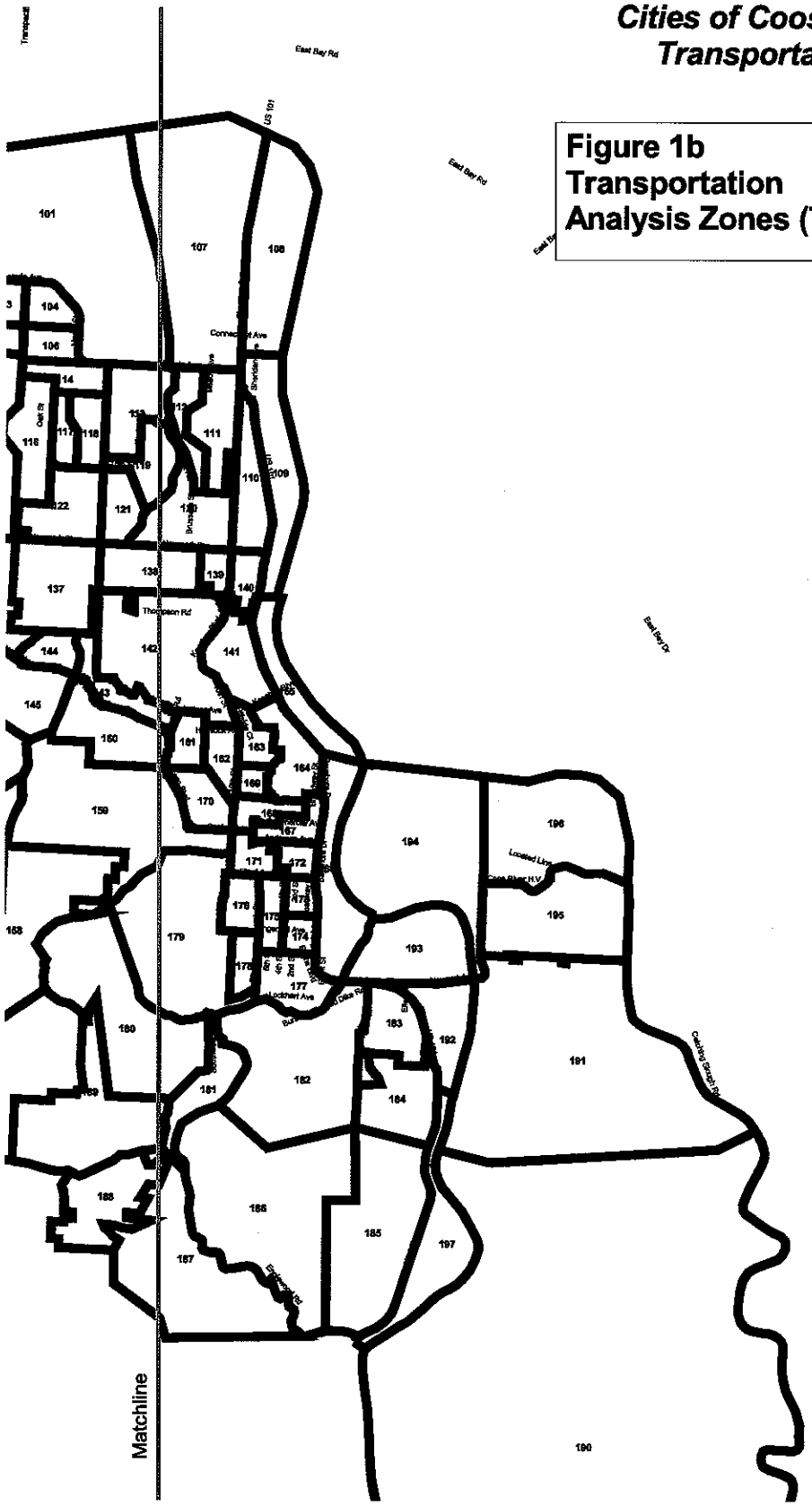
DKS *Associates*

Cities of Coos Bay/North Bend
Transportation System Plan

Figure 1b
Transportation
Analysis Zones (TAZ's)

N
NOT TO SCALE

Source:
-ODOT
-City of Coos Bay
-City of North Bend



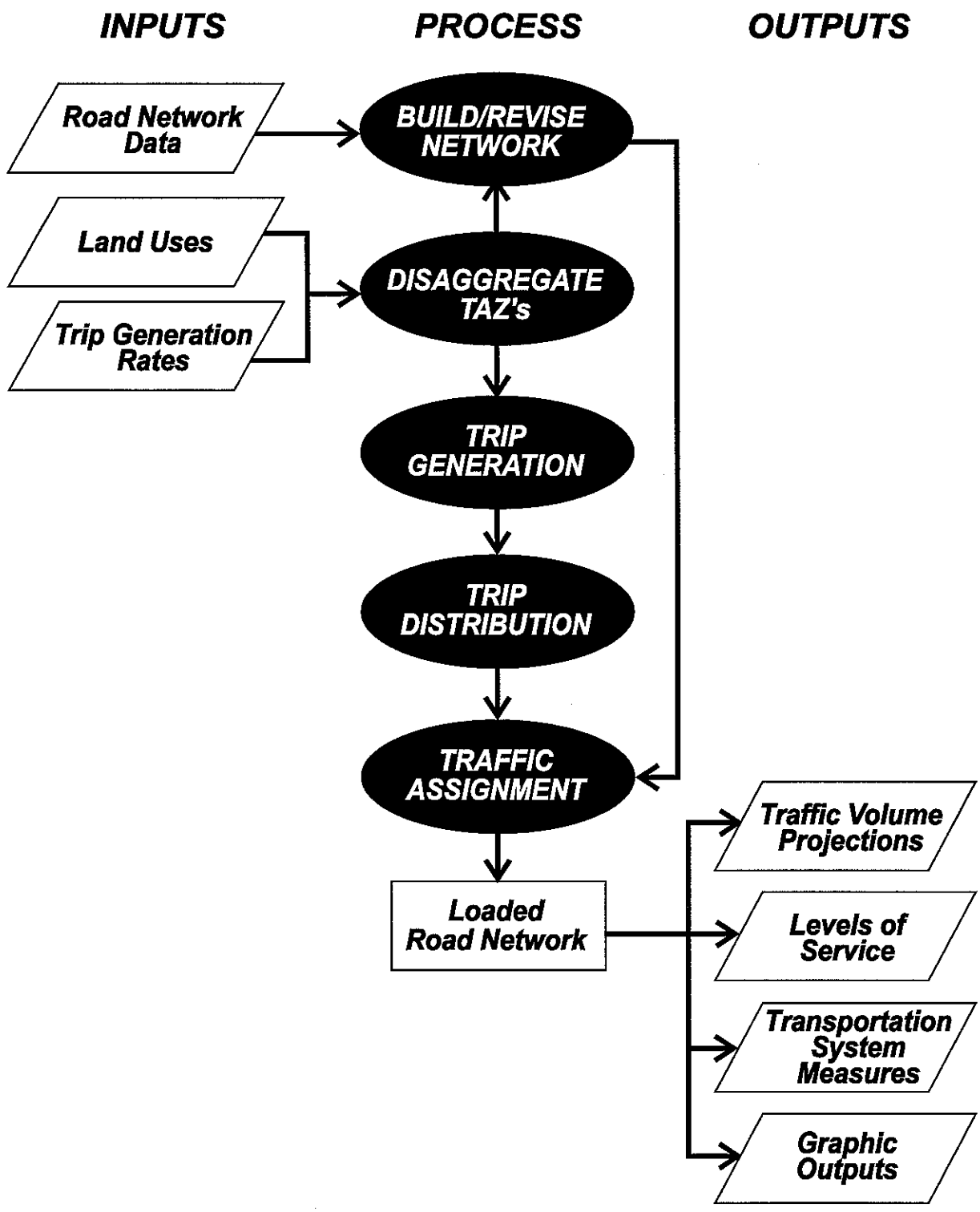


Figure 2
TRAFFIC FORECASTING MODEL PROCESS

Trip Generation

The trip generation process translates land use quantities (number of dwelling units, retail, and other employment) into vehicle trip ends (number of vehicles entering or leaving a TAZ) using trip generation rates established during the model verification process. The trip generation process is elaborate, entailing detailed trip characteristics for various types of housing, retail employment, non-retail employment, and special activities. Typically, most traffic impact studies rely on the Institute of Transportation Engineers (ITE) research for analysis[2]. The model process is tailored to variations in travel characteristics and activities in the region.

Table 2 illustrates the estimated growth in vehicle trips generated within the Coos Bay and North Bend area (the area shown in Figure 1) during the PM peak period (1-hr peak) between 2000 and 2020. It indicates that vehicle trips in Coos Bay and North Bend would grow by approximately 17 percent between 2000 and 2020 if the land develops according to the City's 2020 land use assumptions. Assuming a 20-year horizon to the 2020 scenario, this represents annualized growth rate of about 0.8 percent per year. Through traffic (traffic with neither an origin or destination in Coos Bay or North Bend is anticipated to grow by about 14 percent during the same time period.

Table 2
Existing and Future Projected Vehicle Trip Generation
PM Peak Hour Period Vehicle Trips

	2000 Trips	*2020 Trips*	*Percent Increase*
Coos Bay and North Bend TSP study area	9,980	11,682	+17

Trip Distribution

This step estimates how many trips travel from one zone in the model to any other zone. Distribution is based on the number of trip ends generated in each zone pair, and on factors that relate the likelihood of travel between any two zones to the travel time between zones. In projecting long-range future traffic volumes, it is important to consider potential changes in regional travel patterns. Although the locations and amounts of traffic generation in Coos Bay and North Bend are essentially a function of future land use in the city, the distribution of trips is influenced by regional growth, particularly in neighboring areas such as Bandon and Reedsport as well as unincorporated areas to the north, south, and east of Coos Bay and North Bend. External trips (trips that have either an origin and not a destination in Coos Bay and North Bend or have a destination but not an origin in Coos Bay and North Bend) and through trips (trips that pass through Coos Bay and North Bend and have neither an origin nor a destination there) were projected using trip distribution patterns based upon census data and traffic counts performed at gateways into the Coos Bay/North Bend area.

Mode Choice

This is the step where it is determined how many trips will be by various modes (single-occupant vehicle, transit, carpool, pedestrian, bicycle, etc.). The 2000 mode splits are incorporated into the base model and adjustments to that mode split may be made for the future scenario, depending on any expected changes in transit or carpool use. These considerations are built into the forecasts used for 2020.

[2] *Trip Generation Manual*, 6th Edition, Institute of Transportation Engineers, 1997.

Traffic Assignment

In this process, trips from one zone to another are assigned to specific travel routes in the network, and resulting trip volumes are accumulated on links of the network until all trips are assigned.

Network travel times are updated to reflect the congestion effects of the traffic assigned through an equilibrium process. Congested travel times are estimated using what are called "volume-delay functions" in EMME/2. There are different forms of volume/delay functions, all of which attempt to simulate the impact of congestion on travel times (greater delay) as traffic volume increases. The volume-delay functions take into account the specific characteristics of each roadway link, such as capacity, speed and facility type. This allows the model to reflect conditions somewhat similar to driver behavior.

Model Verification

The base 2000 modeled traffic volumes were compared against actual traffic volume counts across screenlines, on key arterials, and at key intersections. Most arterial traffic volumes meet screenline tolerances for forecast adequacy. Based on this performance, the model was used for future forecasting and assessment of circulation change.

Model Application to Coos Bay and North Bend

Intersection turn movements were extracted from the model at key intersections for both the base year 2000 and forecast year 2020 scenarios. These intersection turn movements were not used directly, but a portion of the increment of the year 2020 turn movements over the 2000 turn movements was applied (added) to existing (actual 2002) turn movement counts in Coos Bay and North Bend. The portion added reflected 18/20ths (0.90) of the increment since the base year counts were from 2002 and the model base year is 2000 as well as a 20 percent (1.2) adjustment to account for seasonal variation between the model (March/April time frame[3]) and August when our counts were conducted. A post processing technique is utilized to refine model travel forecasts to the volume forecasts utilized for 2020 intersection analysis. The turn movement volumes used for future year intersection analysis can be found in the technical appendix for the TSP. Future 2020 intersection volumes can be found in the appendix of this memorandum.

[3] Because of the standards used in ODOT's TPAU, the Coos Bay/North Bend travel demand forecast model was developed specifically to reflect and evening peak hour in March or April

TAZ	HHBASE	POPBASE	HHFUTR	POPFUTR	EMPBASE	EMPFUTR
100	303	802	437	1157	15	15
101	99	223	100	225	287	436
102	0	0	46	0	0	0
103	191	476	191	476	5	5
104	84	211	124	311	363	521
105	144	394	174	476	12	12
106	127	305	133	319	12	55
107	333	704	421	890	468	581
108	145	354	145	354	207	208
109	0	0	0	0	317	321
110	219	545	274	682	554	554
111	216	455	264	556	178	179
112	441	1139	476	1229	54	60
113	208	465	211	472	686	794
114	110	323	120	352	57	57
115	75	204	149	405	9	9
116	214	571	249	664	22	22
117	19	53	21	59	29	29
118	88	219	91	226	65	97
119	51	119	61	142	161	162
120	248	589	259	615	7	11
121	35	105	56	168	127	139
122	322	798	426	1056	90	90
123	69	161	69	161	458	558
124	71	213	110	330	0	0
125	125	391	125	391	100	264
126	100	255	100	255	2	2
127	184	495	184	495	144	226
128	75	186	85	211	7	69
129	321	805	321	805	79	150
130	9	22	9	22	111	130
131	294	770	294	770	107	175
132	131	373	131	373	0	0
133	89	216	89	216	36	36
134	18	46	18	46	33	60
135	72	96	72	96	160	175
136	374	741	374	741	429	727
137	298	593	428	852	292	374
138	276	684	282	699	193	251
139	52	137	70	184	19	17
140	154	334	160	347	283	283
141	114	239	114	239	96	300
142	367	939	367	939	1623	1871
143	162	378	164	383	33	33
144	65	210	90	291	14	25
145	93	147	93	147	193	490
146	205	334	382	622	85	150
147	80	178	180	401	2	25
148	218	582	300	801	12	80
149	36	74	39	80	17	17
150	371	891	391	939	3	3

TAZ	HHBASE	POPBASE	HHFUTR	POPFUTR	EMPBASE	EMPFUTR
151	67	136	72	146	32	32
152	224	563	239	601	13	13
153	297	772	312	811	146	146
154	172	398	177	410	56	56
155	20	49	20	49	0	0
156	73	204	85	238	41	44
157	16	47	16	47	0	0
158	1	2	1	2	0	0
159	111	250	141	318	29	29
160	113	297	129	339	30	50
161	74	163	74	163	1	1
162	37	98	37	98	40	50
163	109	271	109	271	19	30
164	145	293	145	293	328	400
165	0	0	15	0	0	100
166	8	18	30	68	825	950
167	155	233	155	233	900	1000
168	97	211	97	211	189	249
169	56	126	56	126	0	0
170	131	328	131	328	1	1
171	251	471	251	471	245	300
172	15	34	15	34	512	612
173	18	38	18	38	235	300
174	38	67	38	67	249	349
175	172	396	172	396	146	175
176	81	203	81	203	121	150
177	87	161	87	161	374	474
178	127	305	127	305	22	22
179	188	457	235	571	61	61
180	305	810	340	903	36	50
181	45	101	45	101	11	11
182	171	445	191	497	54	54
183	174	425	174	425	58	62
184	89	206	109	0	0	0
185	102	223	117	256	130	135
186	122	303	147	365	2	2
187	35	85	55	134	2	2
188	123	281	138	315	7	7
189	145	365	160	403	13	13
190	297	744	347	869	44	44
191	130	335	180	464	32	32
192	46	100	46	100	15	9
193	101	246	101	246	281	281
194	158	430	196	533	116	203
195	388	904	395	920	40	70
196	54	139	54	139	86	96
197	30	71	30	71	0	0
Totals	13493	32348	15359	36409	13798	17513