

City of Nehalem Downtown Transportation Plan

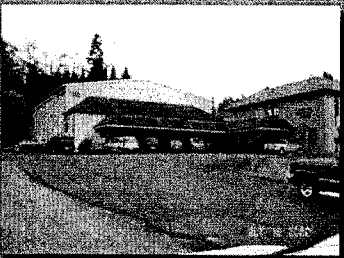
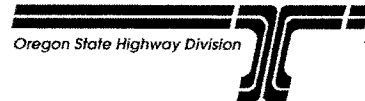


Prepared For:

City of Nehalem

and

Oregon Department of
Transportation



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Contents

Section	Page
Executive Summary	ES-1
1 Introduction.....	1-1
Planning Team and Process	1-1
Project Management Team	1-1
Public Involvement.....	1-1
Goals and Objectives.....	1-3
Goal 1: Mobility, Safety and Accessibility	1-3
Goal 2: Pedestrians and Bicycles.....	1-3
Goal 3: Implementation.....	1-4
Plan and Policy Review	1-4
Nehalem	1-4
Tillamook County	1-4
State of Oregon/ODOT.....	1-5
Federal	1-5
2 Existing Conditions and Future Opportunities.....	2-1
Existing Conditions and Deficiencies	2-1
Motor Vehicle Operations.....	2-2
Pedestrian Facilities	2-6
Bicycle Facilities	2-6
Bicycle and Pedestrian Circulation.....	2-6
Transit and Intermodal Travel	2-6
Future Conditions and Opportunities.....	2-7
Motor Vehicles.....	2-7
Bicycle and Pedestrian Facilities	2-8
3 Alternatives and Recommendations.....	3-1
U.S. 101/7th Street Intersection Design	3-1
Key Issues.....	3-1
Short-Term Solutions.....	3-2
Long-Term Solutions	3-4
Other Solutions Considered But Rejected	3-6
Other Improvements on U.S. 101	3-7
Sidewalks	3-7
Curb Extensions	3-7
Marked Crosswalks	3-8
Speed Limit Reduction.....	3-9
Gateways.....	3-9
TCTD Bus Stop and Shelter	3-10
Truck Loading Zone	3-10
Special Transportation Area.....	3-11

Section	Page
Flooding on U.S. 101	3-13
Local Street Design	3-13
Cross Sections.....	3-13
Street and Sidewalk Connectivity	3-14
Interpretive Trail	3-14
Evaluation Criteria and Results	3-17
Implementation	3-17
Goal 1: Mobility, Safety and Accessibility.....	3-18
Goal 3: Implementation	3-21
Funding.....	3-23
TSP Exemption.....	3-24

Appendixes

- A Public Involvement Documentation
- B Plan and Policy Review Technical Memorandum
- C Existing Conditions and Traffic Data
- D Roundabout Feasibility Study

Tables

2-1 Street Ownership and Functional Classification	2-1
2-2 Operational Analysis of 30th-Highest-Hour Conditions (Year 2002): U.S. 101 at 7th Street	2-4
2-3 Crash Analysis (Year 1997 to 2001 Data)	2-5
2-4 Crash Rates Along U.S. 101	2-5
2-5 Operational Analysis of 30th-Highest-Hour Conditions (Year 2022): U.S. 101 at 7th Street	2-7
3-1 Preliminary Review of STA Characteristics as They Relate to Nehalem ¹	3-12
3-2 Evaluation Criteria and Results	3-18
3-3 Cost Estimates	3-23
3-4 Potential Funding Sources.....	3-24

Figures

1-1 City of Nehalem - Location Map.....	1-2
3-1 Recommended Short-Term Changes at US 101 - 7th St Intersection.....	3-3
3-2 Limited One-Way Configuration ("Couplet") at US 101 - 7th St Intersection	1
3-3 Generic Roundabout Design (Not Specific to Nehalem).....	3-6
3-4 Recommended Curb Extension Locations	3-8
3-5 Gateway Concepts	3-10
3-6 Recommended Local Street Cross Sections.....	3-15
3-7 Standard Designs of Boardwalks, Bollards, and Earthen Trails	3-16

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Executive Summary

The Nehalem Downtown Transportation Plan addresses key transportation issues in the city (see Figure 1-1). The plan focuses on U.S. 101 in Nehalem, with specific attention to the intersection where U.S. 101 makes a 90-degree turn.

The plan's goals are:

- Improve mobility, safety and accessibility for all travel modes
- Improve pedestrian and bicycle circulation and facilities
- Provide for improvements that can be implemented and that comply with applicable standards

This plan has three sections: 1) Introduction, 2) Existing Conditions and Future Opportunities and 3) Alternatives and Recommendations. The recommendations are summarized below.

Summary of Recommendations

U.S. 101/7th Street Intersection Design

- Need: Geometric constraints result in vehicle turn movement problems; unconventional traffic control at intersection results in confusion; pedestrian crossing concerns with large vehicles.
- Recommendations:
 - Short-Term: Widen northbound receiving lane to accommodate truck turning; off-set sop bar for southbound left-turn lane; extend A Street between 7th and 8th Streets; provide curb extensions on east side of intersection to improve pedestrian crossing; reduce posted speed to 25 mph; consider larger turning radius on southwest corner of intersection.
 - Long-Term: A roundabout may be a possible long-term solution at the U.S. 101/7th Street intersection; however, a number of concerns would need to be addressed adequately before it would be a preferred solution. Without further analysis, no action is recommended at this time.

Other Improvements on U.S. 101

- Need: Improve the balance between the local needs (pedestrian and bicycle traffic, supportive of local businesses, parking) on Nehalem's main street (which is U.S. 101) and the needs of through traffic.
- Recommendations: Over the long term, add sidewalks and/or widen sidewalks on U.S. 101; provide curb extensions and crosswalks at key intersections; reduce posted speed to

25 mph; provide gateways as recommended by the Oregon Downtown Development Association (ODDA) plan; locate a new bus shelter to the south/ west of U.S. 101; further explore special transportation area designation in Nehalem.

Local Street Design

- Need: Improve connectivity for all modes and provide for pedestrians, bicycles and on-street parking.
- Recommendations: In the long term, implement three different cross sections in the city (depending on right-of-way widths) to provide sidewalks and on-street parking; add sidewalk connection between school and community center on 8th Street between B and C Streets; extend A Street between 7th and 8th Streets.

Interpretive Trail

- Need: Improved pedestrian access to the wetlands and river would provide a desired recreational and interpretive opportunity for residents and visitors.
- Recommendations: Design and construct interpretive trail to wetlands and the Nehalem River, as shown in the ODDA plan.

SECTION 1

Introduction

The Nehalem Downtown Transportation Plan is a focused effort that addresses key transportation issues in the City of Nehalem (see Figure 1-1). The plan focuses on U.S. 101 in Nehalem, with specific attention to the intersection where U.S. 101 makes a 90 degree turn. The study area is bounded by U.S. 101/7th Street, 10th Street, Tohls Street, and C Street. The plan provides recommendations for improvements to the U.S. 101/7th Street intersection, improvements elsewhere on U.S. 101, local street design and connectivity, and an interpretive trail.

Planning Team and Process

Project Management Team

A project management team (PMT) was formed at the beginning of the planning process to provide overall guidance and policy direction for the transportation plan. The PMT, consisting of city, Oregon Department of Transportation (ODOT) and consultant staffs, met initially in October 2002 to begin the project. Members of the team met subsequently as part of the project advisory committee (PAC) (see below) and communicated regularly throughout the project.

Public Involvement

A focused public involvement process was conducted as part of the transportation plan to ensure the substantive participation of Nehalem citizens, stakeholders and other interested parties in the plan. Key components of the public involvement process were meetings of the city-appointed PAC – made up of elected business owners and citizens, appointed city officials and other agency representatives – and a public open house.

The purpose of the PAC meeting on February 5, 2003, was to introduce the PAC and the consultant team, provide an overview of the project, and present and discuss background information and draft alternative concepts. Background information included the draft goals and objectives, and the existing conditions and future opportunities memorandum. Draft alternatives were presented for long- and short-term options for safety and capacity at the U.S. 101/7th Street intersection, typical roadway cross sections, curb extensions and crosswalk treatments, an interpretive trail and gateways. The agenda and summary notes from the PAC meeting are included in Appendix A.

About 15 people participated in a public open house held on April 9, 2003. The participants included members of the city council, the planning commission, downtown committee, other members of the public, and agency representatives. The consulting team presented and discussed the draft alternative concepts, which had been revised based on the PAC comments. A summary of the open house is included in Appendix A.

Goals and Objectives

The PMT and the PAC developed goals and objectives for the plan. The purpose of the goals and objectives listed below is to create a framework for the transportation plan and help ensure that the plan responds to the needs and desires of the community. Many of the goals and objectives were drawn from existing planning documents for Nehalem, such as the city's comprehensive plan and the Resource Team Report prepared by the Oregon Downtown Development Association (ODDA) in 2001.

Goal 1: Mobility, Safety and Accessibility

Improve mobility, safety, and accessibility for all travel modes.

Objectives:

1. Improve street connections and intersections, especially with U.S. 101, as needed to address circulation, safety and capacity deficiencies.
2. Reduce impacts of truck traffic in Nehalem's downtown; address truck parking and loading issues.
3. Improve on- and-off street parking opportunities; connect with school and recreation center as possible.
4. Provide for improvements to public transportation loading areas and circulation routes.
5. Improve traffic circulation for fire and emergency vehicles.
6. Address flooding on U.S. 101 as applicable, including alternate routing during floods.
7. Explore potential for special transportation area (STA) designation for U.S. 101 in Nehalem.

Goal 2: Pedestrians and Bicycles

Improve pedestrian and bicycle circulation and facilities.

Objectives:

1. Create better pedestrian and bicycle linkages across U.S. 101 to link business and recreational destinations to downtown.
2. Identify appropriate streetscape improvements, including landscaping, pedestrian-scale lighting, benches and street trees.
3. Provide facilities, such as sidewalks, crosswalks, curb extensions and signage, for safe and pleasant pedestrian travel.
4. Identify potential alignment for shared-use path to connect residents and visitors with the Nehalem River.

Goal 3: Implementation

Provide for improvements that are implementable and comply with applicable standards.

Objectives:

1. Propose new or updated design standards for city streets, in particular to emphasize traffic calming and pedestrian and bicycle travel.
2. Develop designs that improve local street connectivity as applicable.
3. Ensure that new facilities (and existing facilities as feasible) comply with the Americans with Disabilities Act (ADA).
4. Develop designs that minimize environmental impacts.
5. Develop designs that are cost-effective.
6. Develop designs that meet applicable local, county, state and federal plans, standards and criteria.
7. Develop a plan with sufficient detail to qualify for funding of engineering and construction phases.

Plan and Policy Review

As an initial step in the planning process, the consultant team reviewed applicable city, county and state plans and policies relevant to the transportation planning process. The purpose of this review was to provide a policy context for the planning effort, help ensure that proposed projects were consistent with existing relevant plans and policies, and aid in the development of implementing ordinances for the transportation plan.

The consulting staff reviewed documents for the jurisdictions that own, regulate or provide public services on the public roadways in Nehalem. These jurisdictions include the city, Tillamook County, the Tillamook County Transportation District (TCTD) and the State of Oregon. Results of the plan and policy review are included in Appendix B.

The following documents were reviewed:

Nehalem

- Comprehensive Plan (Adopted 1980, amendments through 1999)
- Zoning Ordinance (Ordinance No. 80-2; amendments through 2002)
- Subdivision Ordinance (Ordinance No. 8-03; amendments through 2002)
- Nehalem Street Standards (Adopted April 10, 1980)
- Resource Team Report (ODDA, February 2001)

Tillamook County

- Draft Tillamook County Comprehensive Plan (spring 2002)
- Tillamook County Zoning Ordinance (December 2002)
- Tillamook County Land Division Ordinance (December 2002)

- Tillamook County Public Road Improvement Ordinance (1999)
- Urban Growth Area Agreements Between County and Cities (1996)
- Tillamook County Transportation District

State of Oregon/ODOT

- State Planning Goals (1973)
- Transportation Planning Rule (Oregon Administrative Rule [OAR] 660-012)
- Oregon Transportation Plan (1992)
- Oregon Highway Plan (1999)
- Draft Oregon Rail Plan (2001)
- Oregon Public Transportation Plan (1997)
- Oregon Bicycle and Pedestrian Plan (1995)
- Oregon Transportation Safety Action Plan (1995)
- Access Management Rules (OAR 734-051)
- Freight Moves the Oregon Economy (1999)
- Transportation System Planning Guidelines (2001)
- Proposed Oregon Coast Highway Corridor Master Plan (ODOT, 1995)
- Scenic Byway Management Plan for the Nehalem, Tillamook, and Nestucca Regions of the U.S. 101 Corridor in Oregon (ODOT, 1997)
- Pacific Coast Scenic Byway Corridor Management Plan for U.S. 101 in Oregon (ODOT, 1997)

Federal

- Transportation Equity Act for the 21st Century (TEA-21) and Implementing Regulations (23 Code of Federal Regulations [CFR] 450 and 49 CFR 613)

SECTION 2

Existing Conditions and Future Opportunities

This section describes existing transportation conditions and deficiencies and identifies future opportunities as part of the plan. The project focuses on U.S. 101 in Nehalem, with specific attention to the intersection where U.S. 101 makes a 90-degree turn. The study area is bounded by U.S. 101/7th Street, 10th Street, Tohls Street, and C Street.

U.S. 101 serves as the main street for Nehalem. The businesses and facilities along U.S. 101 serve both local residents and those passing through on the highway. U.S. 101 is known as H Street as it travels east-west and 7th Street/Riverside Drive as it runs north-south in Nehalem.

Existing elements, such as roadway and intersection geometry, vehicle traffic, pedestrian facilities, and bicycle facilities, were evaluated. As appropriate, future conditions and opportunities also are identified.

Existing Conditions and Deficiencies

There are three principal public agencies (ODOT, Tillamook County and the City of Nehalem) that own the public rights-of-way in the study area. Table 2-1 shows the functional classification of each street. Field measurements of the streets in the study area are shown in Appendix C (Part 1).

TABLE 2-1
Street Ownership and Functional Classification

Street Name	Right-of-way Ownership	Functional Classification
U.S. 101 (7 th Street/Riverside Drive and H Street)	Oregon Department of Transportation	Statewide Highway—National Highway System (NHS) Scenic Byway Non-Freight Route
Tohls Street	City of Nehalem	Local
A Street	City of Nehalem	Local
B Street	City of Nehalem	Local
C Street	City of Nehalem	Local
7th Street/North Fork Road	Tillamook County	Collector
8th Street	City of Nehalem	Local
9th Street	City of Nehalem	Local
10th Street	City of Nehalem	Local

Motor Vehicle Operations

Study Intersections and Raw Traffic Counts

An operational analysis of existing (2002) and future, forecasted, no-build conditions (2022) was conducted at the intersection of U.S. 101 with 7th Street/North Fork Road. The most recent traffic count was conducted at this intersection on March 30, 2001, which was Friday of Spring Break 2001. See Appendix C (Part 2) for the raw traffic counts.

The ODOT Future Volume Tables, which are available on the ODOT Web site¹, were used to determine a projected growth rate of 2.3 percent along U.S. 101 within the Nehalem city limits. The ODOT Future Volume Tables use historical data to project future average daily traffic (ADT) volumes along state highways. The 2.3 percent growth rate was applied to the year 2001 raw count data to determine 2002 projected traffic volumes. See Appendix C (Part 3) for the growth rate calculations.

Analysis of the Rockaway Automated Traffic Recorder

ODOT traffic analysis procedures call for 30th-highest-hour traffic volumes to be used to calculate volume-to-capacity (v/c) ratios for intersections and street segments. To identify seasonal factors to apply to the raw count data and determine 30th-highest-hour traffic volumes at each intersection, an analysis of the Rockaway automated traffic recorder (ATR) site (29-001) was conducted. The Rockaway ATR site was used in the analysis because it is the closest recorder along U.S. 101 in relation to the study intersection; it is about 9 miles south of 7th Street/North Fork Road in Nehalem.

At the intersection of U.S. 101 with 7th Street/North Fork Road, the traffic count was conducted during Spring Break 2001. Using summary data available on the ODOT Web site², the volumes measured during the Spring Break 2001 traffic count were compared with the 30th-highest-hour volumes measured at the Rockaway ATR site. At the Rockaway ATR site, the 30th-highest-hour volume was 15.8 percent of the ODOT ADT volume at the ATR site. Using this same percentage and the ODOT ADT volume for U.S. 101 in Nehalem, a two-way, 30th-highest-hour volume of 950 vehicles west of 7th Street would be expected along U.S. 101. Comparing the turn movement volumes measured during the traffic count with the 30th-highest-hour volume results in a seasonal factor of 1.57. This seasonal factor is consistent with data from the seasonal factor table available on the ODOT Web site³. A seasonal factor of 1.60 was applied to the count conducted at the intersection of U.S. 101 and 7th Street.

See Appendix C (Part 4) for 2002, 30th-highest-hour traffic volumes in Nehalem.

Analysis Inputs

Using the year 2002, 30th-highest-hour traffic volumes, an operational analysis of existing conditions was conducted with Synchro, version 5, for the Nehalem study intersection. Synchro is based on the Highway Capacity Manual (HCM), Transportation Research Board

¹ http://www.odot.state.or.us/tddtpau/papers/2019_Future_percent20_Volumes.pdf

² http://www.odot.state.or.us/tdb/traffic_monitoring/01tv/atr01_29.htm

³ http://www.odot.state.or.us/tddtpau/papers/2000_Seasonal_percent20_Factors.pdf

Special Report 209. For each of the intersections, results from the Synchro HCM unsignalized report are reported in this transportation plan.

The following inputs were used in the analysis:

- Ideal saturation flow rate: 1,800 vehicles/hour
- Intersection geometry: Intersection geometry is based on observations from the field visit and sketches provided in the traffic counts
- Synchro defaults for the peak hour factor (0.92) and heavy vehicle percentages (2 percent) were used in the analysis
- Pedestrians: Minimal, less than 10 per hour across each minor approach
- Grade = 0 percent
- Posted speeds were entered for each segment
- Lane width: 12 feet
- Right turn on red: Allowed

The intersection of U.S. 101 with 7th Street/North Fork Road has unique operating conditions. Northbound turn movements (U.S. 101) are free because drivers are not forced to yield to drivers on other approaches. Eastbound left-turn movements are stop-controlled and eastbound right-turn movements are free. Within Synchro and HCS2000, it is not possible to model these exact operating conditions.

To approximate the operating conditions at this intersection, two configurations were modeled using Synchro, Version 5. The first configuration, which includes a yield sign on the northbound approach, underestimates the operating performance of the intersection (that is, the operating conditions likely are better than the results included in this report). The second configuration models U.S. 101 as a straight roadway, with the minor movements from 7th Street/North Fork Road intersecting U.S. 101. The second configuration likely overstates the operating performance of the intersection (that is, the operating conditions likely are worse than the results included in this report).

State Highway Mobility Standards

The 1999 Oregon Highway Plan (OHP) designates U.S. 101 as a statewide National Highway System (NHS) non-freight route. (While freight movement still occurs on U.S. 101, it is not part of the primary state-designated freight system.) In Nehalem, the speed on U.S. 101 ranges from 30 mph to 45 mph, and the section of U.S. 101 is inside the urban growth boundary (UGB) in a non-metropolitan planning organization (MPO) area. Therefore, the mobility standard designated by the OHP for this section of roadway is a v/c ratio of less than 0.80. The study intersection is currently unsignalized and the minor approaches have speed limits of less than 45 mph. Therefore, the OHP designates a maximum v/c ratio of 0.85 for local road approaches in the UGB (non-MPO areas, speed limit of less than 45 mph).

The highway mobility standards designated in the OHP apply primarily to transportation planning decisions. Separate mobility design standards are contained in ODOT's *Highway Design Manual*. These latter standards would be applied at the time a project is constructed and are not necessarily the same as the planning standards.

Level of Service Analysis

Level of service (LOS) is a measure of effectiveness for traffic operations at an intersection. Traffic is able to move freely at an intersection operating at LOS A, B, or C. Traffic operations become progressively worse as traffic operations move toward LOS D and E. LOS F represents conditions where traffic volumes exceed capacity, resulting in long queues and delays. LOS is based on control delay time at an intersection for unsignalized intersections. Appendix C (Part 5) provides detailed definitions of LOS.

Operational Analysis of Existing Conditions (30th Highest Hour)

Table 2-2 presents the LOS, OHP mobility standard, v/c ratio and delay time for the study intersection analyzed under 2002, 30th-highest-hour conditions, and Appendix C (Part 6) contains a detailed report summarizing the operational performance. Table 2-2 includes both configurations that were modeled using Synchro. Table 2-2 reports results for several movements on the major and minor approaches to the intersection.

TABLE 2-2

Operational Analysis of 30th-Highest-Hour Conditions (Year 2002): U.S. 101 at 7th Street

Movement	LOS	OHP Mobility Standard	Max. V/C Ratio	Delay (seconds)
Configuration 1: Yield Sign on Northbound Approach				
Note: Operations likely are better than the results summarized below for Configuration 1				
Southbound Through/Right	A	0.85	0.15	8.0
Eastbound Left	A	0.80	0.10	9.2
Eastbound Right	A	0.80	0.48	9.1
Northbound Left/Through	C	0.80	0.65	15.4
Configuration 2: U.S. 101 Modeled as Straight Approach				
Note: Operations likely are worse than the results summarized below for Configuration 2				
Southbound Through/Right	C	0.85	0.38	21.9
Eastbound Left	A	0.80	0.06	8.7
Eastbound Right	A	0.80	0.32	0
Northbound Left/Through	A	0.80	0.31	0

Source: Synchro Highway Capacity Manual Unsignalized Report.

As shown in Table 2-2, the study intersection meets mobility standards designated in the OHP for existing 30th-highest-hour conditions under both configurations.

Intersection Crash Analysis—Existing Conditions

A crash analysis was conducted for three intersections in Nehalem using data from January 1, 1997, to December 31, 2001, which were obtained from ODOT. The intersections

of U.S. 101 with 7th Street, Tohls Street, and 8th Street were included in the analysis. Table 2-3 summarizes the number of crashes resulting in property damage only, injuries, and fatalities at each of the three intersections, including the entering approaches, from years 1997 to 2001. The crash analysis is based on reported accidents only.

TABLE 2-3
Crash Analysis (Year 1997 to 2001 Data)

Location	Property Damage	Injuries	Fatalities	Crash Rate ¹
U.S. 101 at 7th Street	0	4	0	0.31
U.S. 101 at Tohls Street	1	0	0	N/A
U.S. 101 at 8th Street	1	0	0	N/A

Source: ODOT Crash Data, Years 1997 to 2001.

¹ Crash rate in terms of million entering vehicles. N/A indicates average daily traffic volumes not available.

Using average ADT volumes for the 5-year period, a crash rate of 0.31 was determined for the intersection of U.S. 101 at 7th Street (see Table 2-3). A crash rate of 0.31 million entering vehicles does not indicate a safety problem at this intersection. Each of the four crashes occurred on the entering approaches to the intersection and resulted in injuries. Two of the crashes were rear-end crashes and the two other crashes involved illegal U-turns on U.S. 101.

Crash rates were not determined for the intersections of U.S. 101 with Tohls Street and 8th Street because ADT information for these intersections was not available.

Segment Crash Rates—Existing Conditions

As described in the 2000 State Highway Crash Rate Tables published by the Crash Analysis and Reporting Unit, U.S. 101 is considered a non-freeway primary highway. Table 2-4 summarizes the year 2000 crash rate and the 5-year average crash rate (1996 to 2000) along U.S. 101 within the Nehalem city limits.

TABLE 2-4
Crash Rates Along U.S. 101

Location	Year 2000 Crash Rate ¹	5-year Average Crash Rate ¹
U.S. 101—Nehalem (Urban)	0.57	1.17

Source: 2000 State Highway Crash Rate Table, Crash Analysis and Reporting Unit, ODOT.

¹Crash rate in terms of million vehicle miles.

On urban sections of primary non-freeway segments throughout the state, the 5-year statewide average crash rate was 3.52 crashes per million vehicle miles (MVM) and the 2000 statewide average rate was 2.95 per MVM. As shown in Table 2-4, both the year 2000 and 5-year average crash rates along U.S. 101 in Nehalem are lower than the statewide averages on similar types of roadway.

Pedestrian Facilities

Sidewalks exist in Nehalem along U.S. 101 and Tohls Street in the downtown core (see Appendix C (Part 1)). Some of these sidewalks have curb ramps, but none is compliant with the current ADA requirements because of steep grades. ADA standards require curb ramps to have a grade of less than 8 percent.

There are no signalized intersections or signalized pedestrian crossings in Nehalem. Striped crosswalks are located at the intersections of U.S. 101/Tohls Street and U.S. 101/7th Street.

Bicycle Facilities

U.S. 101 is designated as the Oregon Coast Bike Route and serves thousands of cyclists each year. The bike facility exists as a paved shoulder that varies between 3 to 8 feet wide along most of the Oregon Coast, but in Nehalem, bicyclists must ride in the auto travel lane because of the narrow right-of-way and presence of on-street parking. Currently, there are no other designated bicycle facilities in Nehalem. The residential streets in Nehalem provide good bike routes because of their low traffic volumes, but H Street and 7th Street/Riverside Drive contain some hazards because of on-street parking, higher vehicular traffic volume and vehicular turning movements.

There are no adequate bicycle parking facilities in Nehalem. Secure bike parking can take various forms, as long as it provides an immovable and stable fixture compatible with common U-type locks and accommodates the locking of bicycle wheels and frames.

Bicycle and Pedestrian Circulation

The land use, retail development and roadway network in Nehalem is conducive to walking and bicycling. The active storefront development along 7th Street/Riverside Drive (U.S. 101), with a variety of destinations and services, contributes to the street's function as a main street for Nehalem, where citizens and visitors to Nehalem can walk easily to multiple destinations. The street also provides a direct connection to the public docks on the Nehalem River, which is a major destination in Nehalem.

Currently, there are no signalized crossings across 7th Street/Riverside Drive. This makes it sometimes difficult for pedestrians to cross the highway. Another impediment to bicycle and pedestrian circulation in Nehalem is the lack of through-connectivity between some streets, such as 8th Street and A Street. Connections between streets would reduce travel distance between destinations by minimizing out-of-direction travel.

Transit and Intermodal Travel

Public transportation in Nehalem is provided by the Tillamook County Transportation District (TCTD). The bus makes one stop in downtown Nehalem and provides service to the other incorporated cities in Tillamook County and also to downtown Portland. From there, passengers have access to the Portland transit system, the Portland airport, Amtrak rail service, and Greyhound bus service.

Future Conditions and Opportunities

Motor Vehicles

Year 2022 Traffic Volumes

Year 2022, future, forecasted, no-build, 30th-highest-hour traffic volumes were developed to evaluate future operating conditions in Nehalem at the study intersection. A projected growth rate of 2.3 percent, as calculated using the ODOT Future Volume Tables, was used in the analysis of future, forecasted, no-build, 30th-highest-hour conditions. The 2.3 percent growth rate was applied to year 2002 30th-highest-hour volumes to calculate year 2022, future, forecasted, 30th-highest-hour traffic volumes.

See Appendix C (Part 7) for 2022, future, forecasted, 30th-highest-hour traffic volumes at each of the study intersections.

Operational Analysis of Future Conditions (30th Highest Hour)

Table 2-5 presents the LOS, OHP mobility standard, v/c ratio and delay time for the study intersection analyzed under 2022, 30th-highest-hour conditions, and Appendix C (Part 4) contains a detailed report summarizing the operational performance. Table 2-5 reports results for several movements on the major and minor approaches to the intersection. Movements that will not meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions are shown in bold, italic text.

TABLE 2-5

Operational Analysis of 30th-Highest-Hour Conditions (Year 2022): U.S. 101 at 7th Street

Movement	LOS	OHP Mobility Standard	Max. V/C Ratio	Delay (seconds)
Configuration 1: Yield Sign on Northbound Approach				
Note: Operations are likely better than the results summarized below for Configuration 1				
Southbound Through/Right	A	0.85	0.22	8.9
Eastbound Left	B	0.80	0.16	10.3
Eastbound Right	B	0.80	0.68	12.8
<i>Northbound Left/Through</i>	<i>E</i>	<i>0.80</i>	<i>0.95</i>	<i>42.8</i>
Configuration 2: U.S. 101 Modeled as Straight Approach				
Note: Operations are likely worse than the results summarized below for Configuration 2				
<i>Southbound Through/Right</i>	<i>F</i>	<i>0.85</i>	<i>0.90</i>	<i>91.2</i>
Eastbound Left	A	0.80	0.11	9.7
Eastbound Right	A	0.80	0.45	0
Northbound Left/Through	A	0.80	0.44	0

Source: Synchro Highway Capacity Manual Unsignalized Report.

As shown in Table 2-5, the northbound left/through movement at the study intersection under Configuration 1 (northbound approach modeled with a yield sign) will not meet

mobility standards designated in the OHP under future, forecasted, 30th-highest-hour conditions. Under Configuration 2 (U.S. 101 modeled as straight approach), the minor turn movements from 7th Street/North Fork Road will barely not meet OHP mobility standards.

Bicycle and Pedestrian Facilities

In terms of improving pedestrian conditions, the City of Nehalem has the opportunity to complete the sidewalk network and construct improvements, such as curb extensions and marked crosswalks on 7th Street/Riverside Drive (U.S. 101). Crossings at selected intersections could be demarcated using concrete or stamped and dyed asphalt. These improvements may improve pedestrian safety and comfort along and across U.S. 101 Avenue in Nehalem, by indicating to drivers that the pedestrians may be present, and that drivers must yield to pedestrians in the crosswalk. Pedestrian conditions also could be improved by adding amenities, such as street furniture and street trees, which would improve the aesthetic appearance of 7th Street/Riverside Drive while also acting as visual cues to slow vehicle travel speeds.

The typical on-street bicycle facility consists of a striped lane about 4 to 6 feet wide, but this may not be appropriate on most local streets in Nehalem because of the low vehicular traffic volumes. However, striped bicycle lanes may be appropriate on 7th Street north of U.S. 101, providing a safe route to and from areas north of town. In Nehalem, bicycle conditions could be improved using the traffic calming features mentioned above (curb ramps, marked crosswalks, street amenities) where appropriate. Secured bicycle parking at destinations such as the post office, city hall, the docks, Nehalem Elementary School, the North County Recreation Center and at retail destinations would provide accommodation for bicyclists at key downtown destinations.

Another opportunity for improving bicycle and pedestrian conditions in Nehalem would be to construct pathways that connect “dead end” streets and also could provide connections to destinations such as the Nehalem Elementary School and the North County Recreation Center. These pathways could consist of on-street facilities, such as sidewalks, or off-street facilities, such as shared-use trails.

SECTION 3

Alternatives and Recommendations

This section describes the draft alternatives developed by the consultant team and presented to the PMT and PAC and to the general public at the open house. It indicates which alternatives were rejected and which were supported for further development. At the end of this section, a table is presented that compares all of the alternatives against the plan's goals, objectives and evaluation criteria.

The alternatives development process consisted of the following steps:

- The consultant team, PMT, and PAC developed goals and objectives.
- The consultant team developed the existing conditions and future opportunities document, which was reviewed by the PMT and PAC.
- The consultant team developed a set of draft alternatives for presentation and review at the PMT and PAC meeting on February 5, 2003. The draft concepts were revised on the basis of discussions at that meeting.
- In February 2003, the consultant team presented the concepts related to U.S. 101 to a group of ODOT staff members for their review and comment.
- Based on input from the January and February meetings, the consultant team revised the concepts and presented them at a public open house on April 9, 2003.
- Subsequently, the consultant team wrote the draft transportation plan and presented it for a final review to the PMT, PAC and ODOT staff.

U.S. 101/7th Street Intersection Design

Key Issues

From the beginning of the planning process, the U.S. 101/7th Street intersection was identified as needing study and improvement. The following are key issues:

- The intersection has unconventional permanent traffic control that makes it confusing for bicycles, pedestrians and vehicles.. The intersection currently operates as follows:
 - Northbound U.S. 101 traffic is uncontrolled
 - Southbound U.S. 101 traffic is stop-controlled for the through and left-turn movements, but right-turns are permitted without stopping
 - Southbound 7th Street (North Fork Road) traffic is stop-controlled
 - The parking area to the east of the intersection is stop-controlled.

- The southbound U.S. 101 “right turn permitted without stopping” is a form of traffic control that is unfamiliar to out-of-state motorists who frequently use the highway for pleasure travel. Based on public feedback and field observation, this movement is the most misunderstood by motorists.
- Vehicle turning movements are not accommodated at this intersection. Field observation and physical evidence in the existing roadway show that large trucks (WB-50) and school buses have a difficult time maneuvering through all three major legs of this intersection. The northeast corner of the intersection is currently a vacant lot. This corner has an existing power pole and fire hydrant immediately behind the curb. Vehicles tend to shy away from obstructions this close to the roadway, thus reducing the usable area of pavement for maneuvering. It is also apparent from observation that a large vehicle headed northbound in the intersection must wait for left-turning southbound traffic to clear the intersection before entering, resulting in delays.
- Based on traffic volume forecasts, the intersection will fail to meet the mobility standards set by the OHP if the existing lane configuration remains (see Section 2).

Short-Term Solutions

Based on the problem statement above, the consultant team explored several short-term options to improve the U.S. 101/7th Street intersection with respect to safety and function, while complying with state highway policies and avoiding adverse impacts to the downtown area. Given the physical constraints at this location and the limited options for changing the stop control (see below), the following short-term changes are suggested (see Figure 3-1):

- Widen the northbound receiving lane to accommodate a larger turning path and relocate the utilities per current design standards. This alternative would have no impact on existing structures, but would require a right-of-way acquisition at the northwest corner of the intersection.
- Offset the stop bar for the south-bound left-turn lane. This would require the southbound left-turning vehicle to stop short of the intersection, allowing additional turning space for northbound vehicles and reducing conflicts and congestion.
- Extend A Street between 7th Street (North Fork Road) and 8th Street. This would allow some local and through traffic to avoid the U.S. 101/7th Street intersection, reducing congestion. (See discussion in Local Street Design subsection.)
- Provide a curb extension across and on both sides of the driveway on the east side of the intersection. Provide colored and textured crosswalks on the side streets and on U.S. 101 if allowed by ODOT. This would improve pedestrian conditions in the intersection area.
- Reduce posted speed from 30 mph to 25 mph. (See discussion below.)

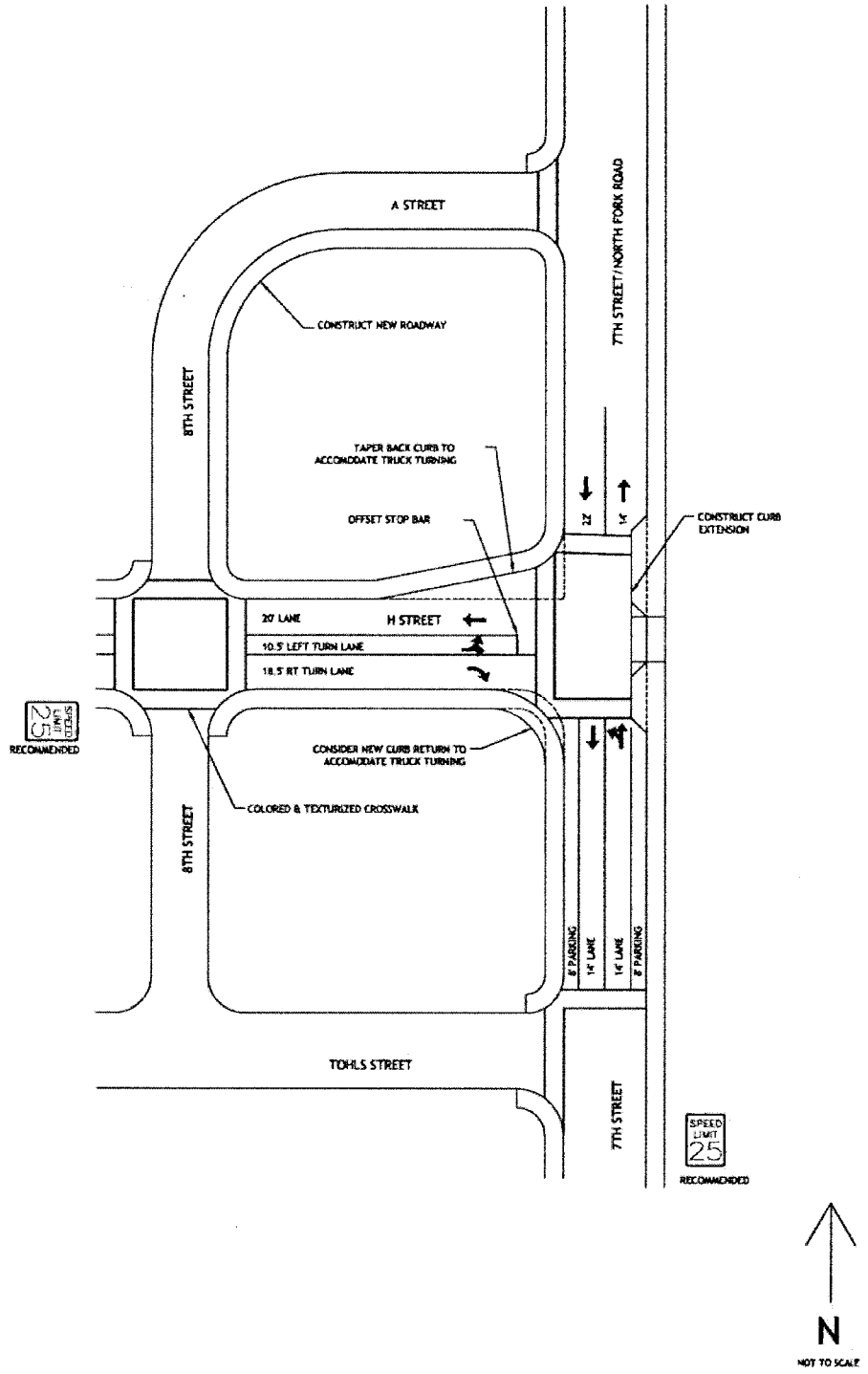


FIGURE 3-1
Recommended Short-Term Changes at US 101 - 7th St Intersection

In addition to these changes, the southwest corner of the intersection (adjacent to the southbound U.S. 101 right-turn lane) could be considered for a larger curb return radius and possible setback to allow for more maneuverability. This option could affect the commercial/retail property adjacent to U.S. 101 as well as the parking area and access ramp to the building. Some on-street parking would be lost on southbound U.S. 101 to accommodate the new curb and sidewalk geometry. Before proceeding, this option should be explored further to more clearly determine the benefits and impacts.

The PAC and the public open house participants supported these options.

Recommendation

Based on the discussion above, including the support of the PAC and the public open house participants, the short-term changes described above are recommended. These changes would be implemented by ODOT staff who may have additional suggestions for the intersection.

Long-Term Solutions

Although the short-term design concepts presented above would improve conditions at the U.S. 101/7th Street intersection, the recommended changes would not increase vehicle capacity and would not provide a long-term solution to ensure that the intersection would meet operational requirements for the state highway. For this reason, potential long-term improvement concepts were explored. Because of the presence of buildings adjacent to U.S. 101 and the desire to preserve and improve the commercial area in the city, there are relatively few options for providing additional highway capacity without adversely affecting the downtown area.

Two options with the potential to improve highway operations and preserve the existing downtown area were explored as part of this plan.

Limited One-Way Configuration (“couplet”)

With this option, the existing U.S. 101 between Tohls Street and H Street would carry northbound highway traffic, and 8th Street and Tohls Street would carry southbound highway traffic (see Figure 3-2). This option would provide additional vehicle capacity at the intersections because traffic would be only one way. However, the southbound movement on 8th Street and Tohls Street would introduce additional curves into U.S. 101, which would result in significant private property impacts. Although the one-way system would provide the opportunity for wide sidewalks and new development, it also would require the relocation of existing development and would significantly decrease drive-by parking in front of existing businesses on U.S. 101. These are just some of the potential issues to be considered with this option.

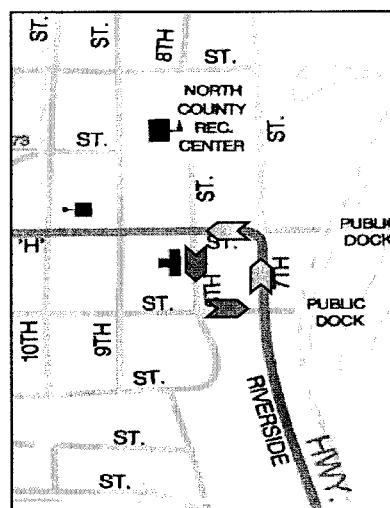


FIGURE 3-2
Limited One-Way Configuration (“Couplet”)
at US 101 - 7th St Intersection

This concept was presented to the PAC and the public open house participants. The group was strongly against this option because of the many adverse impacts to the downtown area, including those described above.

Roundabout

A second option suggested for discussion by the consultant team was a roundabout (see Figure 3-3). Because of the nature of the traffic issues at the U.S. 101/7th Street intersection, a roundabout likely would improve both mobility and safety at the intersection.

Roundabouts are becoming popular traffic control devices in the United States and, with the construction of a roundabout on U.S. 101 in Astoria, recently have been introduced on the state highway system in Oregon. However, a roundabout would be a dramatic change from the existing condition and would require additional study to determine its potential benefits and drawbacks at this location.

The roundabout concept was presented to the PAC and the public open house participants. Several concerns about this solution were expressed, including loss of parking and other potential adverse impacts on the downtown businesses, ability of large vehicles to maneuver, driver confusion, and impacts to existing structures and properties. The public open house participants indicated they would prefer a roundabout over a couplet as a long-term solution, but did not favor proceeding with either option at this time.

Feasibility Study. Based on the city's desire to plan proactively for a long-term solution at this location that is supportive of city goals, and a desire by ODOT to determine whether a roundabout would address traffic needs and should be further considered at this location a feasibility study of the roundabout was conducted. The study, including a conceptual drawing, is included as Appendix D.

ODOT staff reviewed and commented on the study in June 2003. These comments indicated that while a roundabout may be a potential future solution at this location, a number of issues would need to be addressed first, including:

- A roundabout would result in significant out-of-direction travel for northbound traffic (drivers must travel most of the way around the circle)
- A roundabout might result in driver confusion due to the need to turn left in order to continue northbound on the highway
- Traffic volumes on all legs of a roundabout should be similar. North Fork Road has significantly less traffic than the U.S. 101 approaches
- Need to exhaust simpler and cheaper solutions first

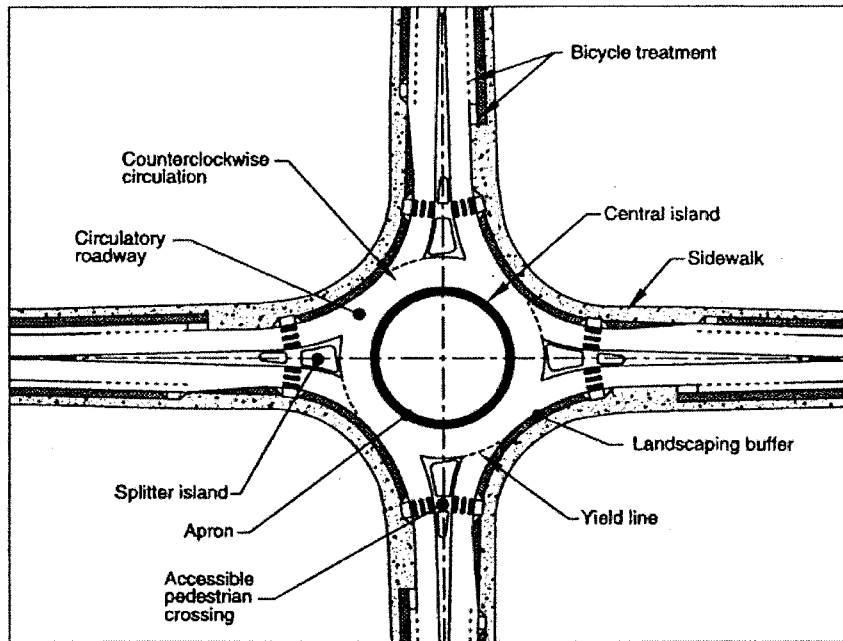


FIGURE 3-3
Generic Roundabout Design (Not Specific to Nehalem)

Recommendation

- One-way couplet: Per the discussion and the comments and concerns of the PAC and public open house participants, the one-way couplet option should not be considered further.
- Roundabout: Based on comments from the PAC, the general public and ODOT, a roundabout may be a possible long-term future solution at this location but a number of concerns would need to be addressed adequately before it would be a preferred solution. Without further analysis, no action is recommended at this time.

Other Solutions Considered But Rejected

- Full stop-control for all movements at the U.S. 101/7th Street intersection. This option does not meet OHP mobility standards and, therefore, was rejected on policy grounds.
- Intelligent transportation solution to implement the use of a speed-sensitive traffic signal to control U.S. 101 traffic. The signal would alert drivers to slow down as they approach the intersection if their speed exceeded the posted speed. This method is not widely used, not familiar to drivers and not currently permitted by ODOT.

Other Improvements on U.S. 101

Sidewalks

The existing sidewalks on U.S. 101 in Nehalem are between 5 and 6 feet wide. Wider sidewalks are desirable in a commercial area to provide adequate space for pedestrian circulation, to buffer pedestrians from passing traffic, and to provide space or additional features such as signage, seating and landscaping.

Given the narrow roadway right-of-way and presence of buildings up to the back of the sidewalk, there is little opportunity to expand sidewalks in the core commercial area in Nehalem except as properties redevelop over time. Until that time, sidewalks should be widened to a minimum of 6 feet where possible. Where space allows, sidewalks should be widened to 8 feet. This would provide enough space for a vegetative buffer between pedestrians and the roadway.

Recommendation

In the long term, provide sidewalks and/or wider sidewalks on U.S. 101 where space allows.

Curb Extensions

Curb extensions (sometimes called "bump-outs") benefit pedestrians and drivers in many ways, including:

- Reducing the effective crossing distance of the street
- Increasing the visibility for pedestrians and drivers
- Protecting parked cars from vehicular traffic
- Providing additional space for streetscape amenities, such as benches, lighting and planters
- Visually narrowing the street to encourage slower vehicular speeds

Several curb extensions were proposed in the ODDA plan for Nehalem. These locations were reviewed for feasibility on the basis of traffic turning needs and potential parking impacts. Each curb extension may require the removal of one to two parking spaces, depending on the size and locations of the extension. Often, no parking spaces will need to be removed because on-street parking generally does not extend all the way to the intersection corner. Curb extensions also may make some turning movements difficult for trucks or larger vehicles. For this reason, curb extensions are not recommended at the U.S. 101/7th Street intersection. In other locations, only small curb extensions may be appropriate.

Proposed curb extension locations were presented to the public at the April 9, 2003, open house (see Figure 3-4). The recommended locations were supported by the PAC members and the other participants. Where curb extensions are proposed in locations where sidewalks do not yet exist, sidewalks and curb extensions should be constructed at the same time.

Recommendation

Per the discussion above, curb extensions are recommended in the locations shown in Figure 3-4.

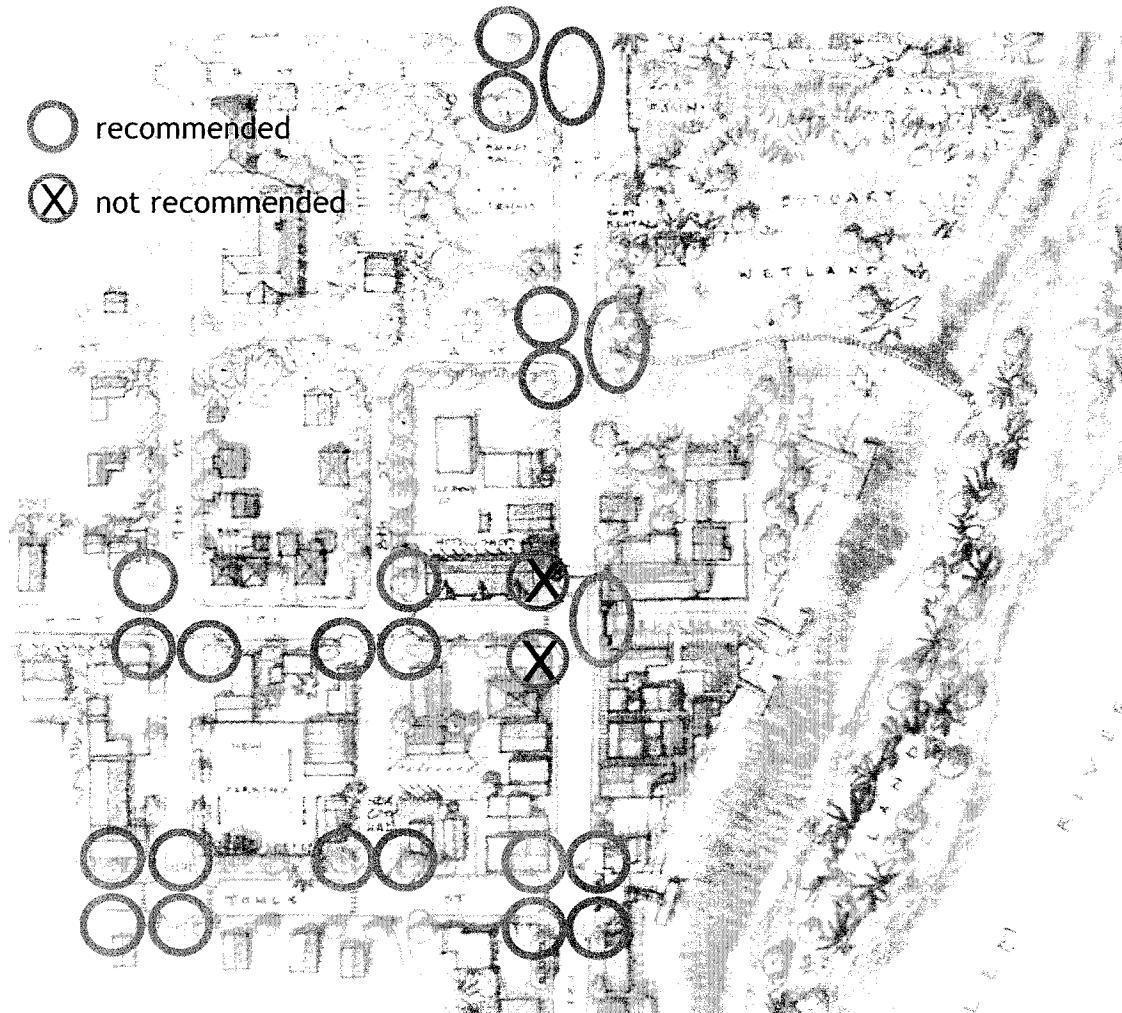


FIGURE 3-4
Recommended Curb Extension Locations

Marked Crosswalks

Marked crosswalks demarcate locations for pedestrians to cross the street and also alert drivers to the presence of pedestrians and their legal obligation to yield when pedestrians are in the crosswalk area. Typically, crosswalks are marked by two parallel lines.

A more aesthetic treatment for crosswalks would involve the use of poured-in-place concrete or stamped and dyed asphalt. Asphalt is the least expensive of the two options but is not as durable as concrete. Each of these treatments provides a color and texture change that would enhance the appearance of the roadway and help define the area of downtown Nehalem. Installing these treatments on U.S. 101 would require ODOT approval.

Speed Limit Reduction

The posted speed limit on U.S. 101 in Nehalem is 30 mph. The PAC is interested in reducing this limit to 25 mph, similar to other constrained downtown areas on the north coast on U.S. 101. Reducing the speed limit requires a request to the State Speed Board and its concurrence following a study of actual speeds on the roadway. If the 85th percentile speed on the road (that speed at which 85 percent of drivers are traveling) exceeds the posted speed, then it is unlikely to be lowered. This requested change also may be pursued as part of an STA designation.

The PAC and public open house participants were strongly in favor of reducing the speed on U.S. 101. Without enforcement, changing the posted speed generally does not change drivers behavior; however, this change along with the others proposed in this section for U.S. 101 would help promote the main street qualities of this portion of U.S. 101.

Recommendation

The city should pursue requesting a speed change to the State Speed Board and/or as part of exploring an STA designation.

Gateways

The ODDA plan for Nehalem identifies a number of potential gateway treatments. Gateways would mark the entrance to downtown Nehalem and could be placed along U.S. 101 just north of 9th Street and just south of Tohls. Another location suggested is across North Fork Road just north of the U.S. 101 intersection. With regard to transportation, gateways that provide some type of vertical element tend to cause reductions in vehicle travel speeds.

As requested by the PAC, the consultant team reviewed the ODOT restrictions related to installing gateways in the public right of way. Gateways are allowed adjacent to the road in the ODOT right-of-way with a permit. Conditions include that gateways are located beyond the required clear zone adjacent to the highway. Gateways above the state highway are not allowed except on a temporary basis. Potential gateway treatments are illustrated in Figure 3-5.

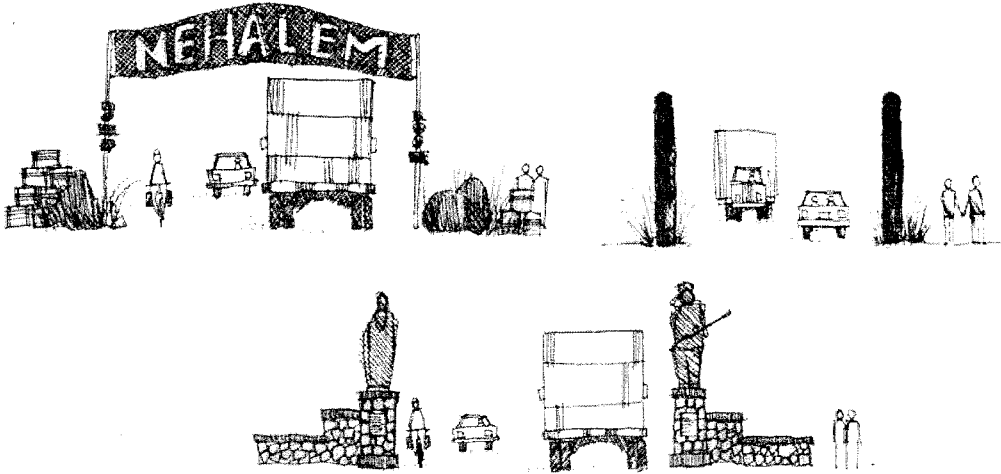


FIGURE 3-5
Gateway Concepts

Recommendation

Based on discussion with the PAC and public open house participants, design and installation of gateway treatments should be pursued in Nehalem.

TCTD Bus Stop and Shelter

TCTD is interested in locating a bus shelter in downtown Nehalem to provide improved facilities for transit users. In response to a request from the PAC, the consultant team reviewed potential locations for siting the shelter and suggested the northeast corner of U.S. 101 and 8th Street, at the edge of the vacant lot currently leased by the city for parking. This location would be convenient for TCTD drivers and is close to the downtown core area. However, at the April 9, 2003, open house, participants recommended that the shelter be located on the opposite side of U.S. 101 so that school children also could use it. The PAC and public open house participants also expressed concerns about placing the shelter on land that the city did not own.

Subsequent review of this issue by the city and TCTD staffs identified a location on 8th Street, between U.S. 101 and Tohls Street, as a preferable location that also would allow use by school children without requiring them to cross U.S. 101.

Recommendation

The city should continue to work with TCTD to locate the bus shelter at a site of its choosing on the south/west side of U.S. 101.

Truck Loading Zone

At their February 5, 2003, meeting, PAC members discussed the need for a truck loading zone. Currently, trucks park on U.S. 101 and Tohls Street, often in the middle of the road or in the parking area. This practice is considered a nuisance and a potential safety concern.

The PAC requested that the consultant team explore a designated truck loading area downtown.

At the April 9, 2003, public open house, the consultant team suggested a loading zone on the north side of Tohls Street just east of U.S. 101. The loading zone would be off the highway, but still close to businesses. However, it would require the loss of on-street parking, at least during certain times of the day. The PAC and public open house participants stated that the costs of the loading zone in terms of parking were not worth the benefits and recommended against it.

Recommendation

Per the discussion above, a dedicated truck loading zone is not recommended. Although it is not ideal, the existing practice of parking on U.S. 101 and/or Tohls Street was preferable to the PAC and public open house participants.

Special Transportation Area

The PAC and city staff are interested in pursuing an STA designation on a portion of U.S. 101 in Nehalem to better balance the needs of through traffic with local traffic and economic development. An STA designation, if appropriate, would help the city and ODOT address through traffic needs on U.S. 101 while supporting the city's desire to maintain and enhance the downtown area as an aesthetically appealing destination that functions well for pedestrians and bicyclists, and is economically vibrant.

The STA designation is a tool developed and supported by the Oregon Transportation Commission designed to make a downtown district function well when the state highway is also the community's main street. For example, an STA may have special features that result in lower speeds, narrower lane widths and wider sidewalks on the state highway. As of May 2003, four STAs have been conditionally designated on district or regional highways in Oregon. To date, no STAs have been designated on statewide highways, such as U.S. 101. Although the STA designation process is currently under review by ODOT, designations on statewide highways require a detailed management plan and an agreement between the local jurisdiction and ODOT. Details of the STA management plan requirements are provided in the OHP.

Potential STA Benefits

- Provides greater flexibility for state highway standards, such as highway mobility, street spacing, signal spacing and street treatments. For example, highway mobility standards may allow for more congestion than on other urban highways.
- Receives ODOT approval up front, addresses exceptions early in the planning process and in writing
- Potential funding benefits – may help the community's main street (for example, U.S. 101) qualify for funds
- Provides certainty about how the highway will be managed

Potential STA Drawbacks

- Criteria and the process are exacting. They must be a good fit to the existing city conditions or the city must have future plans that would make it a good fit.
- It is a new program that has not yet been implemented on a statewide highway, such as U.S. 101
- There may be other, easier ways to make the desired changes.

Review of STA Characteristics

Table 3-1 provides a preliminary review of STA characteristics as they relate to Nehalem and indicates that the downtown core area of the city on U.S. 101 already has a many of the characteristics.

TABLE 3-1
Preliminary Review of STA Characteristics as They Relate to Nehalem¹

STA Characteristic	Is Characteristic Present Today or Likely in Future?	Notes
Location		
Must straddle a state highway; any new development to be built off the highway or only on one side.	Yes	Assumes STA was designated in downtown area. Development is not entirely continuous on both sides of the highway.
Cannot be located on a freeway or expressway.	Yes	U.S. 101 is a statewide highway and not a freeway or expressway.
Area has a majority, if not all, of STA attributes, either as existing or planned uses and infrastructure through an adopted plan.	Maybe	Issues listed as "maybe" in this table would need to be resolved, such as through future development.
STA does not apply to entire city.	Yes	Proposed STA area would be in downtown core area.
Traffic		
STA is located in compact area with local street network to facilitate local auto and pedestrian circulation.	Yes	Development in downtown core area is compact and there is a local street network.
Traffic speeds are slow, generally 25 mph or less.	Maybe	Speed would need to be lowered. Current posted speed on U.S. 101 in the downtown core area is 30 mph.
Identify strategies for addressing freight and through traffic including speed, possible signalization, parallel or other routes, actions elsewhere in the corridor.	Maybe	Options for parallel routes are limited.
Design		
In STA area, there are mixed uses; buildings are close together.	Yes	The downtown commercial area has mixed uses with buildings close together.
Sidewalks have ample width and are adjacent to highway and buildings.	Maybe	Sidewalks are adjacent to the highway and buildings in the downtown commercial area, but are narrow; no space is available to widen them.

TABLE 3-1
Preliminary Review of STA Characteristics as They Relate to Nehalem¹

STA Characteristic	Is Characteristic Present Today or Likely in Future?	Notes
Public road connections are preferred over private driveways.	Maybe	Access management is a key component of an STA. Some driveway closures might be required in the downtown core area.
There is on-street parking or else there are shared parking lots located behind or to side of buildings.	Yes	On-street and off-street parking are present in the downtown area.
Streets are designed for ease of crossing by pedestrians.	Yes	Improvements proposed in this plan would improve pedestrian crossing conditions.

¹ This section is based on the STA description in the Oregon Highway Plan. As of May 2003, the STA designation process is under review.

STA = special transportation area.

Recommendation

- **Short-term:** Because of the exacting requirements of the STA process and uncertainty as to whether the city could meet the requirements in a timely manner, the city should work to implement the recommendations in this plan without an STA designation.
- **Long-term:** To provide the city with greater certainty about the future management of U.S. 101 in Nehalem, the city should continue to explore an STA designation. A first step toward accomplishing this would be to work with ODOT to develop an STA management plan according to the requirements in the OHP.

Flooding on U.S. 101

Flooding is a long-standing problem in Nehalem, in particular at the corner of the U.S. 101/7th Street intersection. This is the result of the relatively low elevation of the road in relation to the seasonal water levels from the river. Because of these limitations, this problem is difficult to address without redeveloping the intersection or constructing an extensive flood protection project. However, the city should continue to work toward a long-term solution to this problem. In the short-term, continued improvements to the alternate routes around this intersection are recommended. These include improvements to 8th Street and Tohls Street as well as the extension of A Street between 7th and 8th Streets.

Local Street Design

Cross Sections

Three street design cross sections were developed to address various local road conditions in Nehalem (see Figure 3-6). The purpose of the cross sections in the long term is to provide consistency and to provide for all travel modes. All of the cross sections provide for two-way travel, on-street parking and sidewalks. The three cross sections correspond to different

right-of-way widths in the city and differ primarily in the type of on-street parking provided:

- 56- to 60-foot right-of-way (8th Street between H Street and Tohls Street): diagonal parking on one side, parallel parking on the other side
- 50-foot right-of-way: parallel parking on both sides
- 40-foot right-of-way: parallel parking on one side, no parking on the other side

The three local street cross section options were presented to the PAC and public open house participants, who supported the concepts with the understanding that they would be implemented as feasible over the long term while minimizing impacts to private property. There were concerns that although the different right-of-way widths exist on paper, there have been encroachments over time and impacts to private properties should be avoided.

Recommendation

Per the discussion above, the three local street cross sections are recommended for long-term implementation.

Street and Sidewalk Connectivity

Street connectivity is a key component of an effective transportation system. As part of the downtown plan, options to improve local street connectivity were reviewed. The following opportunities were identified in the study area:

- A sidewalk between the school and community center on 8th Street between B and C Streets is recommended to provide a safe walking connection for school children who walk between the two locations.
- A roadway connection to extend A Street between 7th and 8th Streets is recommended. In addition to improving local travel options, this connection also would provide an alternative route for some traffic at the U.S. 101/7th Street intersection (see discussion and Figure 3-1 above).

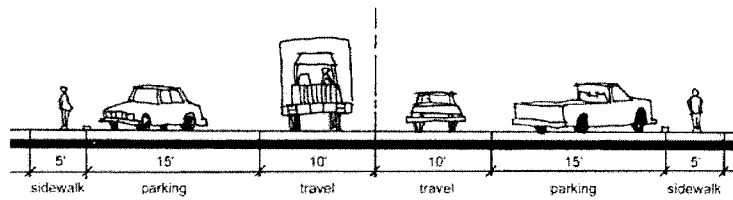
The PAC and public open house participants supported these two options.

Recommendation

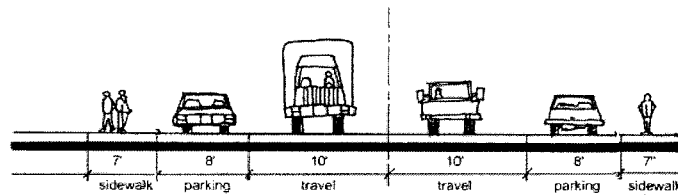
The street and sidewalk extension options identified above are recommended to improve the connectivity of the transportation system.

Interpretive Trail

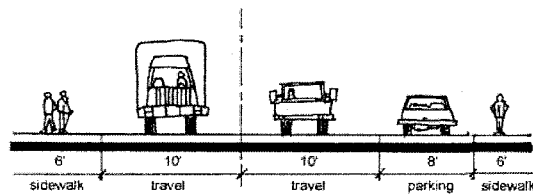
As recommended in the ODDA plan, a walking trail would provide a recreational amenity to the residents of Nehalem. These trails would be non-paved walking trails that are covered with either wood chips or $\frac{3}{4}$ -inch gravel. While wood chips are less expensive, they would biodegrade quickly in Nehalem's climate and require more maintenance to keep the trail from getting too muddy.



60' Right-of-Way
Diagonal Parking on Both Sides



50' Right-of-Way
Two-Way Travel



40' Right-of-Way
Two-Way Travel

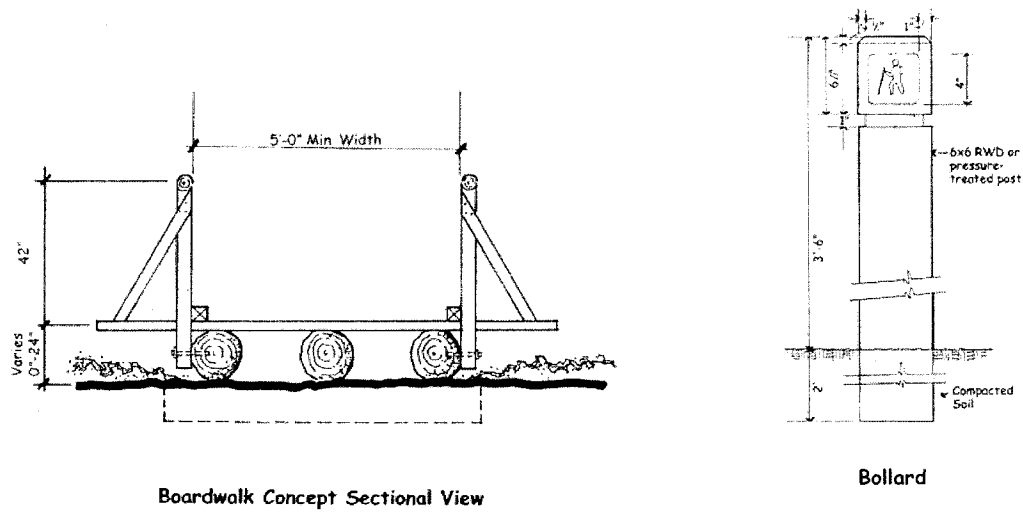
FIGURE 3-6
Recommended Local Street Cross Sections

The trails would provide access to the wetlands northeast of downtown and to the Nehalem River. Because of the existence of the wetlands and tidal influences, a trail near the river would need to be constructed as a boardwalk or "floating" trail.

Standard trail design details are provided in Figure 3-7.

Recommendation

Based on the presentation of this concept to the PAC and public open house participants, the trail shown in the ODDA plan that provides access to the wetlands and the river is recommended.



Boardwalk Concept Sectional View

Bollard

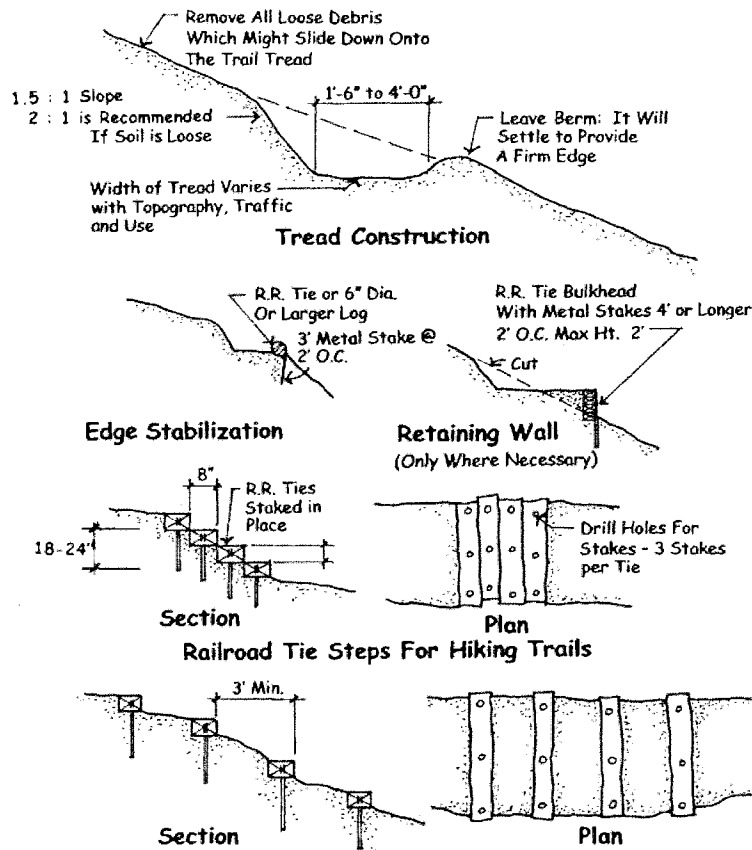


FIGURE 3-7
Standard Designs of Boardwalks, Bollards, and Earthen Trails

Evaluation Criteria and Results

As part of the alternatives development and review process, the alternatives were qualitatively evaluated using criteria based on the plan goals and objectives (see Section 1). The consulting team, the PMT and PAC developed the criteria.

The purpose of the evaluation is to document the features of the alternatives and to ensure that the recommended alternatives are consistent with the plan goals and objectives. Table 3-2 presents the evaluation criteria and results.

Implementation

Construction Cost Estimates

Costs to construct the various recommended projects were estimated at a planning level (see Table 3-3). Based on the conceptual design of each project, a 60 percent contingency was included in the estimate to account for the potential unknowns typically encountered during preliminary and final design. The estimates do not include right-of-way, major structures (for example, retaining walls), design and engineering, wetland or utility relocation costs.

TABLE 3-2
Evaluation Criteria and Results

Goal 1: Mobility, Safety and Accessibility

Improve mobility, safety and accessibility for all travel modes.

Objective	Rating*	Criterion	U.S. 101/7th Street Intersection: Short-Term Improvements	U.S. 101/7th Street Intersection: Long-Term Improvements		Other Improvements on U.S. 101	Local Street Design		Interpretive Trail
			Widen receiving lane at northwest corner, off-set stop bar, extend A Street, provide curb extensions, reduce posted speed, consider widening at southwest corner RECOMMEND	One-way couplet	Roundabout	Add and/or widen sidewalks on U.S. 101; provide curb extensions and crosswalks; provide gateways as recommended by ODDA plan; locate a new bus shelter; further explore STA designation RECOMMEND	Cross sections to include sidewalks, on-street parking RECOMMEND	Sidewalk connection on 8th Street between A and B Streets RECOMMEND	Implement trail as shown in Oregon Downtown Development Plan RECOMMEND
1. Traffic Circulation, Safety and Operations	+	Improves street connections and intersections, especially with U.S. 101, as needed to address traffic circulation, safety and operational deficiencies.							
	0	Does not change street connections or intersections with respect to circulation, safety or operations.	+	+	+	0	0	+	0
	-	Adversely affects street connections or intersections with respect to circulation, safety or operations.							
2. Truck Impacts	+	Reduces impacts of truck traffic in Nehalem's downtown and addresses truck parking and loading issues.							
	0	Does not change truck impacts or parking and loading issues.	+	+	+	0	0	0	0
	-	Increases truck impacts and/or parking and loading issues.							
3. Parking	+	Improves on- and-off street parking opportunities and connects with school and recreation center as possible.							
	0	Does not change parking opportunities or connections with school and recreation center.	0	+	-	0	+	+	0
	-	Reduces parking opportunities and/or adversely affects connections with school and recreation center.							

Objective	Rating*	Criterion	U.S. 101/7th Street Intersection: Short-Term Improvements	U.S. 101/7th Street Intersection: Long-Term Improvements		Other Improvements on U.S. 101	Local Street Design		Interpretive Trail
			Widen receiving lane at northwest corner, off-set stop bar, extend A Street, provide curb extensions, reduce posted speed, consider widening at southwest corner RECOMMEND	One-way couplet	Roundabout	Add and/or widen sidewalks on U.S. 101; provide curb extensions and crosswalks; provide gateways as recommended by ODDA plan; locate a new bus shelter; further explore STA designation RECOMMEND	Cross sections to include sidewalks, on-street parking RECOMMEND	Sidewalk connection on 8th Street between A and B Streets RECOMMEND	Implement trail as shown in Oregon Downtown Development Plan RECOMMEND
4. Public Transportation	+	Improves public transportation loading areas and/or circulation.							
	0	Does not change public transportation loading areas or circulation.	+	+	+	+	+	+	0
	-	Adversely affects public transportation loading or circulation.							
5. Emergency Vehicles	+	Allows for emergency vehicle access and circulation							
	0	N/A	+	+	+	+	+	0	0
	-	Adversely affects emergency vehicle access or circulation.							
6. Flooding of U.S. 101	+	Addresses flooding on U.S. 101 as applicable, including alternate routing during floods.							
	0	Does not address flooding on U.S. 101.	+	-	+	0	0	0	0
	-	Adversely affects flooding on U.S. 101.							
7. Potential Special Transportation Area (STA) Designation	+	Explores potential for STA designation for U.S. 101 in Nehalem.							
	0	N/A	0	0	0	+	0	0	0
	-	Does not explore potential for STA designation.							

*Rating: + = Positive 0 = Neutral - = Negative

Goal 2: Pedestrians and Bicycles

Improve pedestrian and bicycle circulation and facilities.

Objective	Rating*	Criterion	U.S. 101/7 th Street Intersection: Short-Term Improvements	U.S. 101/7 th Street Intersection: Long-Term Improvements		Other Improvements on U.S. 101	Local Street Design		Interpretive Trail
			Widen receiving lane at northwest corner, off-set stop bar, extend A Street, provide curb extensions, reduce posted speed, consider widening at southwest corner RECOMMEND	One-way couplet	Roundabout	Add and/or widen sidewalks on U.S. 101; provide curb extensions and crosswalks; provide gateways as recommended by ODDA plan; locate a new bus shelter; further explore STA designation RECOMMEND	Cross sections to include sidewalks, on-street parking RECOMMEND	Sidewalk connection on 8th Street between A and B Streets RECOMMEND	Implement trail as shown in Oregon Downtown Development Plan RECOMMEND
1. Pedestrian and Bicycle Linkages Across U.S. 101	+	Creates better pedestrian and bicycle linkages across US 101 to link business and recreational destinations to downtown.	0	+	0	+	0	0	0
	0	Does not change pedestrian and bicycle linkages across U.S. 101.							
	-	Adversely affects pedestrian and bicycle linkages across U.S. 101.							
2. Streetscape Improvements	+	Identifies streetscape improvements, such as landscaping, lighting, benches, street trees.	0	0	0	+	+	0	0
	0	N/A							
	-	Does not identify streetscape improvements.							
3. Safe and Pleasant Pedestrian Travel	+	Provides facilities to improve safety and pleasantness of pedestrian travel.	0	+	0	+	+	+	+
	0	Does not change safety or pleasantness of pedestrian travel.							
	-	Adversely affects safety or pleasantness of pedestrian travel.							
4. Shared-Use Path to Nehalem River	+	Identifies potential alignment for shared-use path to connect residents and visitors with the Nehalem River.	0	0	0	0	0	0	+
	0	N/A							
	-	Does not identify potential alignment for shared-use path.							

*Rating: + = Positive 0 = Neutral - = Negative

Goal 3: Implementation

Provide for improvements that are implementable and comply with applicable standards.

Objective	Rating*	Criterion	U.S. 101/7 th Street Intersection: Short-Term Improvements	U.S. 101/7 th Street Intersection: Long-Term Improvements		Other Improvements on U.S. 101	Local Street Design		Interpretive Trail
			Widen receiving lane at northwest corner, off-set stop bar, extend A Street, provide curb extensions, reduce posted speed, consider widening at southwest corner RECOMMEND	One-way couplet	Roundabout	Add and/or widen sidewalks on U.S. 101; provide curb extensions and crosswalks; provide gateways as recommended by ODDA plan; locate a new bus shelter; further explore STA designation RECOMMEND	Cross sections to include sidewalks, on-street parking RECOMMEND	Sidewalk connection on 8th Street between A and B Streets RECOMMEND	Implement trail as shown in Oregon Downtown Development Plan RECOMMEND
1. Street Design Standards	+	Proposed street design standards emphasize traffic calming, pedestrian and bicycle travel.							
	0	Does not change standards with respect to traffic calming, pedestrian and bicycle travel.	0	0	0	0	+	0	0
	-	Proposed standards adversely affect traffic calming, pedestrian and bicycle travel.							
2. Local Street Connectivity	+	Proposed designs improve local street connectivity as applicable.							
	0	Proposed designs do not change local street connectivity.	+	0	0	0	0	+	0
	-	Proposed designs adversely affect local street connectivity.							
3. Comply with Americans with Disabilities Act (ADA)	+	Proposed designs and facilities comply with the ADA.							
	0	N/A	+	+	+	+	+	+	+
	-	Proposed designs and facilities do not comply with the ADA.							
4. Environmental Impacts	+	Proposed designs preserve or enhance environmentally significant areas or natural or historic features.							
	0	Proposed designs do not affect environmentally significant areas or natural or historic features.	0	0	0	0	0	0	+
	-	Proposed designs adversely affect environmentally significant areas or natural or historic features.							
5. Cost Effectiveness	+	Proposed designs are cost-effective and fundable.							
	0	N/A	+	0	0	+	+	+	+

Objective	Rating*	Criterion	U.S. 101/7 th Street Intersection: Short-Term Improvements	U.S. 101/7 th Street Intersection: Long-Term Improvements		Other Improvements on U.S. 101	Local Street Design		Interpretive Trail
			Widen receiving lane at northwest corner, off-set stop bar, extend A Street, provide curb extensions, reduce posted speed, consider widening at southwest corner RECOMMEND	One-way couplet	Roundabout	Add and/or widen sidewalks on U.S. 101; provide curb extensions and crosswalks; provide gateways as recommended by ODDA plan; locate a new bus shelter; further explore STA designation RECOMMEND	Cross sections to include sidewalks, on-street parking RECOMMEND	Sidewalk connection on 8th Street between A and B Streets RECOMMEND	Implement trail as shown in Oregon Downtown Development Plan RECOMMEND
	-	Proposed designs are not cost-effective or fundable							
6. Meet Applicable Plans, Standards, Criteria	+	Designs comply with applicable local, county, state and federal plans, standards and criteria	+	+	+	+	+	+	+
	0	N/A							
	-	Designs do not comply with applicable standards and/or criteria.							
7. Sufficient Detail for Funding	+	Proposed projects are developed to sufficient detail to qualify for funding of engineering and construction phases.	+	0	0	+	+	+	+
	0	N/A							
	-	Proposed projects are not developed to sufficient detail to qualify for funding of engineering and construction phases							

*Rating: + = Positive 0 = Neutral - = Negative

TABLE 3-3
Cost Estimates

Recommended Project	Estimated Cost	Additional Assumptions
U.S. 101/7th Street Intersection: Short-Term Improvements	\$100,000 (U.S. 101/7th Street intersection only) \$400,000 (A Street only)	Assumes reconstructing northwest and southwest corners, curb extension at driveway on east leg of the intersection. Includes curb, sidewalk, restriping and landscaping. For A Street extension between 7th and 8th Streets: Assumes project is 500 feet long. Project includes curb and 10-foot-wide sidewalk (no drainage improvements assumed).
U.S. 101/7th Street Intersection: Long-Term Improvements (Roundabout)	\$1,000,000 or more	Estimate is based on Astoria roundabout. Actual cost would depend on design details such as right-of-way, property impacts, pedestrian/bicycle and aesthetic treatments.
Local Street Design: Cross Sections	\$192,000 per block	Assumes an asphalt overlay on the existing pavement and a new widened roadway section to include two 11-foot-wide lanes and parking, curb and sidewalk. This design assumes each block project is 250 feet long.
Local Street Design: Sidewalk Extension on 8th Street between B and C Streets	\$25,000	Sidewalk Extension: Assumes project is 500 feet long. Project includes curb and 10-foot-wide sidewalk (no drainage improvements assumed).
Interpretive Trail	\$600,000 to \$1,000,000 per mile	The range in cost represents the uncertainty associated with potential constraints, such as environmental conditions and wetlands, topography and other factors.

Funding

A variety of local, state and federal funding sources can be used to improve the transportation system. Most of the federal and state programs are competitive, and involve clear documentation of the project need, costs and benefits. Local funding for the projects in this transportation plan typically would come from the city, Tillamook County and/or potential future bond or other local revenues. Other local funding sources might include grants and private funds.

Table 3-4 summarizes some potential public funding sources for Nehalem's pedestrian, bicycle, and roadway improvements. Some of these funds are restricted to the type of improvements that qualify for assistance. Typically, state and federal funds require projects to comply with current ADA guidelines for accessibility.

Nehalem has unsuccessfully applied to the Oregon Pedestrian and Bicycle Program for funds for the connection between Nehalem Elementary School and the community center. The city staff should work with ODOT staff to determine if the project is likely to be successful if the city applies again. Another potential project for funding from this source is the pedestrian enhancements on U.S. 101.

It is also recommended that the city apply to the State Recreational Trails Program for the interpretive trail. However, the city will need to find additional local funding to design the trail because the funding is dedicated to construction. The State Transportation Enhancements Program (part of the federal TEA-21 legislation) also may be a source for a package of improvements that could include improvements to U.S. 101 and the trail. If these applications are unsuccessful, the city should consider local funds through bonds or other revenue.

TABLE 3-4
Potential Funding Sources

Source	Description	Eligible Projects	Funding Cycle
Oregon State Transportation Improvement Program (STIP)	Administered by Oregon Department of Transportation (ODOT). The STIP provides funding for capital improvements on federal, state, county and city transportation systems. <i>Projects must be regionally significant.</i>	Roadway, public transportation, bicycle, pedestrian, air, freight, bridge	4 Years
Oregon Transportation Investment Act	Passed by the 2001 Oregon legislature. Projects were selected with extensive input from local communities and other stakeholders. <i>Projects must be regionally significant.</i>	Pavement conditions, lane capacity, bridges	N/A
Transportation Enhancements	Must serve transportation need.	Bike/pedestrian/trail	2 Years
Oregon Bike/Pedestrian Grants	Administered by ODOT's Pedestrian and Bicycle Program. Must be in public right-of-way.	Bike/pedestrian	2 Years
System Development Charges	Fees on new construction allocated for parks, streets and public improvements. Where available, funds can be used for right-of-way acquisition and trail construction.	Bike/pedestrian/roadway	Varies
Local/County bond measures approved by voters	Funds can be used for right-of-way acquisition, engineering, design and construction.	Bike/pedestrian/roadway	Varies
Local Improvement Districts	Districts typically are created by local property owners, imposing a "new tax" to fund improvements. Funds can be used for right-of-way acquisition and construction.	Bike/pedestrian/roadway	Varies
State Parks Recreational Trails Fund	Construction funds for trail projects	Off-roadway bike/pedestrian	Annual

TSP Exemption

Cities in Oregon are required under the state Transportation Planning Rule (TPR) to prepare and periodically update a transportation system plan (TSP). Because Nehalem has not had the need or opportunity to conduct a full TSP and because this downtown transportation plan fulfills only some of the TPR requirements, documentation to aid the city in requesting a TSP exemption from the state has been prepared as part of this plan and provided to the city.

APPENDIX A

Public Involvement Documentation

**Project Advisory Committee
Meeting #1**
Nehalem Downtown Transportation Plan

Agenda

Wednesday, February 5, 2003, 6:30-8:30 p.m.
Nehalem City Hall (35900 8th Street)

- 6:30 Introductions, Review Agenda
- 6:40 Project Overview
- Purpose
 - Tasks and schedule
 - Roles and responsibilities
- 6:50 Documents for Review – Brief Discussion
(to be distributed prior to meeting; comments requested by February 14)
- Goals and Objectives and Evaluation Criteria
 - Existing Conditions and Future Opportunities Memo
- 7:10 Alternatives: Review and Comment on Draft Concepts
- Traffic analysis
 - 7th Street intersection
 - Cross sections/street design
 - Other (circulation/connectivity, trail feasibility, Special Transportation Area, etc.)
- 8:20 Next Steps
- Refine and evaluate draft alternatives
 - Next meeting/input from broader community
- 8:30 Adjourn

- Truck turning movements at intersection are a major issue
- Portions of the sidewalk are only 3" above the street on west side of US 101. ODOT is planning to do an overlay of the roadway. When this happens, it will put sidewalk below grade of asphalt street.
- Tohls and 7th Street/US 101 corner are the most important pedestrian activity areas. On weekends, pedestrian activity is highest at the intersection. During the week, greater activity occurs at Tohls.
- The traffic analysis assume that the left turn lane at the 90-degree corner is functional; however, when a truck and car meet in opposing directions one must wait for the other.

Alternatives: Review and Comment on Draft Concepts

Arif Khan distributed drawings and diagrams for conceptual alternatives for Nehalem that included street cross-section options, trail, gateway, and streetscape features and options for the 90-degree corner on US 101. Key comments and discussion are as follows:

Roadway Circulation

- Consultants presented concept of providing pedestrian-only connections at 8th and A Streets, but PAC stressed importance of a roadway connection, as shown on the ODDA Plan. The roadway would curve (the city would acquire the lot at the SE corner), minimizing the need for retaining walls. Michael stated that he had received a construction estimate for this road of \$76,000 or \$176,000. The project ranked high on the County economic development needs and issues list because it would help the development of the block. It would also help spur recreational development just to the north of A Street and it would provide an alternate route for vehicles moving between North Fork Road and US 101 north. *The consultant team will try to clarify the cost and feasibility of this project.*

Trails

- Trail alignment as shown in ODDA plan uses 80' public right-of-way so no private property would be required. Includes a possible bridge to the island (which is currently privately owned). The trail would have to be a boardwalk or floating walkway due to the presence of wetlands and associated environmental issues. The City code would allow this use.

Street Cross-Section and Details

- The benefits and drawbacks of each cross-section was discussed. The primary differences include parking options (parallel vs. diagonal) and width of pedestrian areas.
- The true ROW is different from the accepted ROW; there are encroachments on 8th Street and on US 101. Therefore, the cross-sections may not be appropriate since the agreed-on ROW is narrower than the legal ROW.

- The current elevated sidewalks are on private property; at grade sidewalks are narrow. The ODDA consultant thought sidewalks on US 101 could be extended by about 6 inches.
- Angled/diagonal parking would be good on 8th Street; would be a problem at intersections.
- City is interested in repaving 8th Street and Tohls between US 101 and 8th but is waiting to see what is proposed in this plan. Possibly eligible for funds from ODOT because of the use of these streets as an alternate to US 101 during flooding.
- Stamped/colored asphalt could be a cost-effective way to treat some of the crossings. No room for trees.
- Curb extensions/bump-outs: The group is in favor of having curb extensions/bump outs at US 101 and Tohls but didn't think they would allow for proper turning radius at the 7th/US 101 intersection, though possibly on the east side at the parking lot entrance.
- The group felt that the greatest pedestrian crossing demand (across US 101) was at Tohls (during the week) and at 7th at other times for people accessing the parking lot.
- There are currently 13 public benches downtown

Gateway Treatments/Entrance Signs

- The City is installing new 6'-diameter entrance signs to replace the current ones.
- Gateways are generally vertical elements relatively close to the road that help slow vehicles.
- The ODDA plan shows gateways sign banners at the bottom of the US 101 hill and at the entrance to North Fork Road.
- Unclear where there is space for gateways at north and south ends of town. Clarify whether gateways could be installed in ODOT right-of-way and whether they can extend across/above the road.

7th Street/US 101 Intersection

Three options were presented: Full stop control, Speed detection based stop signal, and Couplet option. None of these options were seen as satisfactory due to their adverse impacts. Instead, a mixture of minor projects related to geometry and roadway markings may be the best fit.

Full Stop Control Option

- The problem with the stop sign options is that trucks have difficulty making it up the hill. Also, there is not a constant traffic problem at the intersection.
- Problems at the intersection appear to be the geometry and clarity. It can be a confusing intersection. Sometimes there are problems with people trying to figure out which way to go. Clearer information for drivers is needed--different forms of pavement markings such as dashed lines through curve, arrows indicating which way to turn would be helpful.

- Need to review required turning radius for large trucks both north bound and south bound and see if there is adequate space. If not, three possibilities: 1) widen US 101 into vacant lot at NW corner of intersection. This would have an adverse impact on future development. 2) Widen US 101 at SW corner of intersection. 3) Remove parking on east side of US 101. This last option would be a major concern to the businesses. However, if this change could be combined with slight widening of the sidewalk, better pedestrian crossings that could make it more acceptable.
- City would like speed reduction on US 101 from 30 mph to 25 mph

Speed-Detection Based Stop Signal

- Concern that it would cause more confusion
- Could you install a pedestrian-activated signal

One-Way Couplet

- The group discussed the possibility of a one-way couplet for US 101 and 8th between H Street and US 101. This idea has been around a long time.
- The idea may have potential in the long term, but there would be three south bound turns—this would result in property loss/impacts in order to get the required turning radius, especially at Tohls and US 101
- Business owners would be concerned about one-way traffic
- Could provide long-term benefits in terms of traffic capacity and future redevelopment options (e.g., along 8th)

Other

- Tillamook Wave has money to put a bus shelter in Nehalem. Consultants should identify a location. Contact is Heather Ornelas as TCTD. Current stop is near Tohls. PAC wondered if TCTD stop could be combined with school bus stop so shelter could be used for school kids as well. School kids currently wait by the lumber company at 9th.
- PAC sees a need for a truck loading zone on Tohls near 8th. Need is for both northbound and southbound delivery trucks but especially truck loading at the grocery store. Trucks currently park on US 101 or on Tohls. Problems with trucks getting back on US 101 and getting up hill.
- Consultants should look at the intersection of 9th and US 101. It serves as a school bus pickup and trucks turn in to the lumber yard there. Heavy post office traffic between 10AM and 11 AM. There is a steep drop at 9th on the south side of 101.
- Special Transportation Area (STA): Michel expressed interest in whether Nehalem could qualify as an STA. Tim passed out a handout explaining some of the criteria. The consultants will provide feedback on whether Nehalem might qualify and will try to get feedback from ODOT too.

Next Steps

The next steps for the consultant team include revising and refining the draft alternatives based on the input from the meeting, and evaluating them using the criteria passed out at the meeting.

The group agreed a public meeting was an appropriate next step but that because of the small audience expected, a combined PAC meeting and public meeting would make sense. Documents (revised alternatives) will be provided in advance if possible. A Wednesday evening during the 1st or 2nd week of April from 6:30-8:30 would be a preferred time. The consultants will select that date and let Michael know as soon as possible. The PAC will coordinate publicity.

Nehalem Downtown Transportation Plan: Public Open House Summary (April 9, 2003)

TO: File
FROM: Tim Burkhardt
DATE: April 11, 2003

Summary

As part of the Nehalem Downtown Transportation Plan, a public open house was held on Wednesday, April 9, 2003, from 6:30 – 8:30 p.m. at City Hall in Nehalem, Oregon.

The purpose of the open house was to present the draft concepts for the transportation plan to the general public and to receive comments on them. The concepts, which focus on motor vehicle, pedestrian, bicycle and parking issues in the downtown area (and the US 101/7th Street corner in particular), had previously been reviewed with the Project Advisory Committee as well as with ODOT. The meeting was advertised by email and by city staff using flyers and word of mouth to businesses, elected officials and other interested parties.

The meeting consisted of brief presentation by consultant staff (Tim Burkhardt and Jim Wilburn from CH2M HILL) followed by discussion and questions and answers. About 15 people attended the meeting, including members of the city council, the planning commission, downtown committee, and other members of the public. Agency representatives in attendance were Michael Nitzsche from the City of Nehalem and Bill Campbell from Tillamook County Planning and Community Development.

Key Comments

The following discussion points were noted from the meeting.

Illustration A (Curb Extensions and Crosswalk Treatments)

- Curb extensions: audience was in favor of locations as shown
- Plan should note that sidewalks need to be constructed in some locations before bumpouts can be added
- No specific comments on textured/colored crosswalk treatments
- ODOT will be doing overlay through Nehalem relatively soon.

Illustration B (Connectivity: Sidewalk Connection on 8th; Extend A Street between 7th & 8th)

- Interest in/support for sidewalk connection to school on 8th and for new street connection on A Street between 7th and 8th.

Illustration C (Interpretive Trail)

- No comments on this concept

Illustration D (Gateways)

- Nehalem has recently installed new welcome signs which serve as gateways at outskirts of town
- Additional gateways could be added right in downtown, as shown in ODDA plan
- City not immediately planning to install additional gateways but would like Downtown Plan to clarify process and constraints in re: ODOT restrictions. For example, why does gateway across US 101 need to be 21 feet high when bridges are only 14-16 feet high? Isn't 21 feet too high for people to see?

Illustration E1-E3 (Short-Term Intersection Treatments)

- Consultants noted that E1 and E2 were eliminated based on feedback from ODOT
- There was general support for E3, in particular pulling back the curb on the NW corner of the intersection.
- There was a lot of discussion about the southbound movements and the possibility of changing the stop controls. For example, could you use a splitter island to create a free right turn and then place the stop sign on the island for through and left-turning traffic only. Also interest in whether different signal lights could be used for the different movements. Jim explained that unless there was room to physically separate the right turns, the stop sign and signal could not be changed from the current configuration. The consultants will review the available space but expected that this change would require removing the building on the corner.
- A separate but related issue was whether the curb on the SW corner of the intersection could be pulled back to allow a larger radius for turning trucks. The consultants will review this but did not expect that more than a foot or two would be available without removing the sidewalk and/or building at that corner.
- A related issue to truck turning was a request to confirm how long the chip trucks are and to make sure the turning radius at the proposed corners is adequate for them.
- Michael asked if the sidewalks on US 101 could be made a foot or so wider as was suggested by the ODDA plan. Jim explained that this distance was so small it wouldn't by itself justify redoing the street but that if or when the road is rebuilt in the future, there might be limited space for widening the sidewalks. The controlling feature would be the minimum lanes widths required on the highway.
- Following discussion, the proposed truck loading zone was eliminated. Although there are some concerns about trucks parking on US 101 during loading, there are no suitable spaces nearby that would not result in lost parking, a high priority to the audience.
- The group was in support of the TCTD bus shelter being located downtown but there was no clarity on where it should go. In general, the audience favored a site on the southbound of US 101 so that users (including school children waiting for the school

bus) would not have to cross the highway. Also favored a site on land that the city owns or controls, such as locations along 8th Street between 101 and Tohls. Consultants will follow-up with TCTD to see if they have any concerns about a location off of US 101. The lot on the north side of 101 between 7th and 8th is leased from an out of state owner and there were concerns that the city might not be able to get agreement from the owner and/or might lose control of the site in the future, as well as concerns that it was on the opposite side of the highway.

- There was a request for better/more permanent pavement marking at the US 101/7th Street intersection. This recommendation will be included in the plan.
- Michael noted that currently the two crosswalks across US 101 are not recognized by ODOT because there is on-street parking within 20 feet of the crosswalk. If bumpouts are added this distance might be increased and, as a tradeoff for losing a parking space at the corner, the crosswalks would then be officially recognized by ODOT.
- There was strong support for the proposal to reduce the speed on US 101 to 25 mph through the downtown. The plan will recommend initiation of the process to do this.

Illustration E4-E5 (Long-Term Intersection Treatments)

- There were a number of concerns about E4 including impacts to properties from smoothing out the curves, loss of drive-by traffic for businesses currently on US 101, and the need to redevelop 8th Street.
- After some discussion, the group was interested in the roundabout as a potential long-term solution but still had concerns and reservations regarding impacts to existing development, loss of parking and/or developable space in the vacant lot, potential adverse impacts on the commercial area (i.e., would it be harder for cars to figure out how to stop?), and need for driver education. Other concerns were where the approaches would be, how the roundabout would relate to the proposed A/8th Street connection, and how drivers would access the businesses currently at the NE corner of the intersection and how they could get to the driveway/parking lot that is currently the E leg of the intersection, and whether parking would be lost.
- The consultants explained that as part of the plan they will be conducting further analysis to determine whether the roundabout would address the traffic needs at this location and how big it would need to be. However, determining the exact size, configuration and potential impacts would be a subsequent step.
- Of the two proposals for long-term solutions, the audience strongly favored the roundabout over the couplet.

Street Design Cross Sections

- No specific comments or changes to these cross sections. The consultants explained that the plan would recommend that these be adopted by the city to apply to future new construction or reconstruction of streets

Plan Review and Adoption Process

Tim discussed this with Michael after the meeting. Michael said the Council could adopt the plan by resolution. A good time to do this would be their June 9 meeting, and the consultants could come and present the plan at that time. The draft plan will be mailed to stakeholders in mid May in time for Michael and one or two others at the city (downtown committee) to review it. Also, the planning commission could review it at their meeting on May 28. Michael will check to see whether this would constitute a land use action and would need public notice and hearing, etc.

APPENDIX B

**Plan and Policy Review
Technical Memorandum**

City of Nehalem Downtown Transportation Plan: Plan and Policy Review Summary

1. Introduction

This document summarizes selected city, county, and state plans and policies relevant to the City of Nehalem Downtown Transportation Plan. Relevant documents were reviewed for the jurisdictions that own, regulate, or provide public services on the roadways within the city. These jurisdictions include the city itself plus Tillamook County, the Tillamook County Transportation District (TCTC), and the State of Oregon.

The following documents were reviewed:

Nehalem

- Comprehensive Plan (Adopted 1980, amendments through 1999)
- Zoning Ordinance (Ordinance No. 80-2; amendments through 2002)
- Subdivision Ordinance (Ordinance No. 8-03; amendments through 2002)
- Nehalem Street Standards (Adopted April 10, 1980)
- Resource Team Report (ODDA, February 2001)

Tillamook County

- Draft Tillamook County Comprehensive Plan (Spring 2002)
- Tillamook County Zoning Ordinance (December 2002)
- Tillamook County Land Division Ordinance (December 2002)
- Tillamook County Public Road Improvement Ordinance (1999)
- Urban Growth Area Agreements between County and Cities (1996)
- Tillamook County Transportation District

State of Oregon/ODOT

- State Planning Goals (1973)
- Transportation Planning Rule (OAR 660-012)
- Oregon Transportation Plan (1992)
- Oregon Highway Plan (1999)
- Draft Oregon Rail Plan (2001)
- Oregon Public Transportation Plan (1997)
- Oregon Bicycle and Pedestrian Plan (1995)
- Oregon Transportation Safety Action Plan (1995)
- Access Management Rules (OAR 734-051)
- Freight Moves the Oregon Economy (1999)
- Transportation System Planning Guidelines (2001)
- Proposed Oregon Coast Highway Corridor Master Plan (ODOT, 1995)

-
- Scenic Byway Management Plan for the Nehalem, Tillamook, and Nestucca Regions of the U.S. 101 Corridor in Oregon (ODOT, 1997)
 - Pacific Coast Scenic Byway Corridor Management Plan for U.S. 101 in Oregon (ODOT, 1997)

United States

- Transportation Equity Act for the 21st Century (TEA-21) and Implementing Regulations (23 CFR 450 and 49 CFR 613)

2. City of Nehalem

2.1 Nehalem Comprehensive Plan

(Adopted 1980, amendments through 1999)

Summary and Relevance to Proposed Plan

- Standard comprehensive plan. The plan's purpose is to preserve the livability and natural environment by managing growth within the urban growth boundary.
- Goals of the plan include:
 - Citizen involvement
 - Development consistent with the natural environment
 - Provide recreational resources
 - Maintain or improve air and water quality
 - Provide variety of housing opportunities
 - Improve local economy
 - Conserve energy
 - Provide safe, convenient, and economic transportation
 - Develop efficient public facilities and services

Relevant Policies and Recommendations

- Transportation: General policies for street patterns, safety, construction, and improvements. New access points to US 101 are discouraged. Rights-of-way not needed for streets should be considered for public use areas or trails. The City supports bus services for those with limited access to transportation. (p. 4-5)
- Land Use:
 - Low Density Residential: Flexibility in street design to minimize tree removal and grading. (p. 19)
 - Town Center Commercial: Explore opportunities for a municipal parking lot, such as at Fire Hall and the school play field. City will develop off-street parking standards through its zoning ordinance. (p. 20)
 - Other Commercial: Consolidate access points to US 101, while providing landscaping and vegetative screening of US 101. (p. 21)

Data Gaps and Policy Issues

- Has further investigation into a municipal parking area been conducted?
- Do City ordinances prescribe landscaping or vegetative screening along US 101?

2.2 Nehalem Zoning Ordinance

(Ordinance No. 80-2; amendments through 2002)

Article 1. Introductory Provisions

Section 1.040 divides lands in Nehalem into the following use zones:

- Marine Residential (MR)
- Low-Density Residential (RL)
- Medium-Density Residential (RM, R1, R2, R3)
- Residential Trailer (RT)
- Commercial (C)
- Public Lands (P)
- Flood Hazards Overlay (FHO)
- Planned Development (PD)
- Low-Density Residential (A1)
- Estuary Zones
- Utility Facility Overlay (UFO)
- Light Industrial (LM)

Section 1.070 includes definitions for the following transportation-related terms: alley, parking space, sign, street.

Articles II – XIII and XXII – XXIV. Use Zones

These articles describe provisions for the use zones listed above. No provisions relating directly to transportation standards, facilities, circulation, safety, etc., were identified.

Article XIV. Supplementary Provisions

Several sections of this article are relevant:

- Section 14.090 – Access. Requires that every lot abut a street other than an alley for at least 25 feet
- Section 14.100 – Clear-Vision Areas. Requires a clear-vision area be maintained on the corners of all property at the intersection of two streets and providing dimensions and other specifications.
- Section 14.110 – Off-street Parking and Loading Requirements. Off-street parking spaces, loading areas and access thereto shall be required at the time a new structure is erected or the use of an existing structure is enlarged.

2.3 Nehalem Subdivision Ordinance

(Ordinance No. 8-03; amendments through 2002)

- Section 1.040 (Definitions): Definitions are included for the following transportation-related terms: alley, arterial, cul-de-sac, feeder, half street, marginal access street, minor street, pedestrian right-of-way, right-of-way, street.

-
- Section 5.020 (Streets): For new streets, policies are included for street widths, alignment, future street extension, intersection angles, existing streets, half streets, grades and curves, street names, private streets.

2.4 Nehalem Street Standards

(Adopted April 10, 1980)

- Apply to all proposed subdivisions of land, planned developments, and major street improvements (beyond routine maintenance) sponsored by the City, County or adjacent property owners.
- Classifies streets as arterial, feeder or residential streets, or residential lanes
- Defines right-of-way widths by classification and provides construction specifications and standards

2.5 Nehalem Resource Team Report

(ODDA, February 2001)

Summary and Relevance to Proposed Plan

- Continue to develop and strengthen Main Street Nehalem (US 101) as the primary business district for the community through elements of design and redevelopment.
- Tourism is important to the local economy. Public amenities such as bike racks, benches, or pedestrian lighting could increase tourist interest.
- Log trucks and 18-wheelers frequently use US 101, creating a challenge for safe pedestrian crossing.

Relevant Policies and Recommendations

- Traffic Improvements: Manage current traffic patterns with improved parking, signage, and landscaping. Minimize street construction in rights-of-way near natural resources by connecting existing streets. Improve pedestrian crossings on US 101. Improve 8th Street to connect to A Street and 7th Street. (p. 9)
- Parking Recommendations: Expand public parking areas near downtown. Parking improvements possible at the Fire Hall, Thols Street, "A" Street, and the Recreation Center. (p. 10)
- Pedestrian Circulation: Improve crosswalks on US 101 with curb extensions and striping or textured pavement (p. 10)
- Streetscape Improvements: (p.10)
 - Installation of street and park lighting
 - Installation of sidewalks, curbs, and drainage
 - Planting in planned areas
 - Uniform design criteria for street furnishings
- A conceptual plan is presented in Appendix A through D, illustrating street and parking design and pedestrian access features.

Data Gaps and Policy Issues

- What was the degree of public reception to suggested improvements?

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- Which improvements do city and residents consider top priorities?
 - What actions have since been taken to implement the suggested improvements, if any?

3. Tillamook County

3.1 Draft Tillamook County Comprehensive Plan

(Spring 2002 draft) Summary and Relevance to Proposed Plan

Standard comprehensive plan organized according to the statewide planning goals. Relevant information from Goal 12 (Transportation) is summarized below.

Relevant Policies and Recommendations

- Transportation (Goal 12):
 - Provide additional through traffic lanes and left turn “refuge” lanes in areas with existing strip development (p. 5)
 - Encourage public transportation use (p. 5)
 - Arterial road networks should be given preferential treatment over collector and local roads (p. 6)
 - Establish road improvement standards (p. 9)
 - Identifies functional classification and intended purpose of numerous roads in county (p. 9-14)
 - Existing driveways along arterial roads should be minimized and consolidated (p. 15)
 - Designated spacing distances for access cross streets, driveways, and intersections (p. 15)
 - Disapprove establishment of State Coast Highway bike route until improvements made to increase safety, develop County-wide Bikeway Plan (p. 17)
 - Road improvements will include provisions for pedestrian safety near school, parks and playgrounds (p. 18)
 - Roadway and Traffic Safety Management Plan (1981) identifies improvement projects for County (p. 19)
 - Encourage maintenance and expansion of existing intercity bus service (p. 26)
 - Adopt County airport overlay zones and zoning compatible with air service (p. 27)
 - County support of navigation and jetty improvements in Tillamook Bay and Nehalem Bay (p. 28)
 - County support of rail transportation to Wheeler, Rockaway, Garibaldi, Bay City and Tillamook (p. 28)

Data Gaps and Policy Issues

- Tillamook County is currently updating their Transportation System Plan (TSP). This update likely will result in changes to the transportation section of the Comprehensive Plan.
- Verify that roadway functional classifications from the County plan are incorporated into city plan with the same identity, future use, and priority for improvement.

-
- Are access spacing distances in plan in agreement with ODOT specifications and recommendations?

3.2 Tillamook County Zoning Ordinance

(December 2002)

The Tillamook County Zoning Ordinance contains the following sections: Article I, Introductory Provisions; Article II, Provisions for Zones; Article III, Zone Regulations; Article IV, Supplementary Regulations; Article V, Property Use Requirements and Exceptions; Article VI, Conditional use Procedures and Criteria; Article VII, Nonconforming Uses; Article VIII, Variance Procedure and Criteria; Article IX, Amendment; Article X, Administrative Provisions; Article XI, Compliance and Penalties; Article XII, Miscellaneous Provisions; Article 16, 17 & 18, Nehalem Ordinances.

Article 1. Introductory Provisions

Definitions are provided for the following transportation-related terms: Access; Alley; Development, Parking Space, Road, Road, County, Road, Public, Roadway, Street, Street line.

Article 3. Zone Regulations

Lands in the County are classified into a large number of use or intensity zones, including some specific zones for the unincorporated area of Pacific City/Woods. Article III describes regulations and permitted uses for each zone.

Article 4. Supplementary Regulations

Transportation related uses or standards are addressed as follows in this section of the code.

- Section 4.030, Off-Street Parking and Off-Street Loading Requirements describes the off-street parking requirements for development within Tillamook County.
- Sections 4.040-065 address the standards and procedures for review of manufactured and mobile homes and home parks.
- Section 4.080, Requirements for Protection of Water Quality and Streambank Stabilization. This section establishes areas for riparian vegetation. Transportation-related standards in this section include the requirement that all development shall be located outside of the areas, but allows for development of bridge crossings or direct water access in conjunction with a water dependent use. In addition, vegetation may be removed for construction of a "minor highway" within an existing right-of-way.

Article 5. Property Use Requirements and Exceptions

Sub section 5.060, Access includes the following standard: "Every lot and parcel shall abut a street other than an alley, an approved private way or an approved private access easement for at least 25 feet." No other transportation related policies are included in this Article.

Article 6. Conditional Use Procedures and Criteria

Article 6 addresses Conditional Use Procedures and Criteria. Transportation facilities are addressed as follows:

- Section 6.040, Review Criteria includes adequacy of public facilities and services as a criteria when reviewing conditional use permits.
- Section 6.060, Conditions of Approval, includes controlling the location and number of access points as a potential condition of approval.

Article 7. Non Conforming Uses and Structures

Article 7 addresses the standards and review procedures for non conforming uses. Transportation related facilities are addressed during a Minor Review land use application. Specifically, Section 7.020.10 identifies an application criteria as "A request for the number and types of vehicle trips to the site."

Article 8. Variance Procedures and Criteria

Article 8 includes the standards and review process for variances to Tillamook County's code. Transportation facilities are not addressed as part of the review process or criteria.

Article 9. Amendments

Article 9 describes the process and criteria for map amendments to Tillamook County's zoning map. Review of traffic circulation and the availability of public facilities and services are included as criteria for the land use review.

3.3 Tillamook County Land Division Ordinance

(December 2002)

The Tillamook County Land Division Ordinance establishes standards for the division of land and the development of public facilities improvements outside of Urban Growth Boundaries of cities within Tillamook County. Sections of the ordinance relevant to transportation are summarized as follows.

Section 2. Definitions

The following transportation-related definitions are used within the ordinance: access; alley; pedestrian way; private street or road; right-of-way; road; road, County; road, public; roadway; street; street functional classification; arterial; collector; local street; turnaround.

Section 40. Improvement Procedures

This section identifies the process for approving improvements in conjunction with the Public Works Department.

Section 41. Improvement Requirements

- Section 41 (1) (c) and (d) specify that the developer is responsible for street construction, that improvements shall be made to the specifications of the Public Works Department and that all parcels or lots shall obtain access by abutting a street other than an alley for a minimum of 25 feet at a point which can be developed for safe access.

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- Section 41 (3) states that, when required by the density or the character of the development, developments may be required to install “pedestrian ways” which are defined as a sidewalk not less than five feet wide.

Section 42. Improvement Standards

- Section 42 (A) Streets, reviews the general standards for development of streets; Section (2) Roadway Width and Alignment Standards, reviews the standards for ADT (Average Daily Traffic); that roadways other than Minimum Local Streets and Minor Local Streets shall be paved. Roadway standards generally follow AASHTO guidelines. Section (3) Minimum Right-of-Way widths are based on the functional classification of the roadways as follows:

Arterials and Collectors---Width of 60 feet

Major Local--- Width of 60 feet

Minor Local---Width of 50 feet

Minimum Local---Width of 25 feet

- Section 42 also contains the standard that any right-of-way width less than 50 feet wide shall be a private street and be dedicated as an easement. Section (4) Dead End Streets, allows dead end streets if the following conditions are met: the street is a Minor Local Street or a Minimum Local Street and the street is not more than 2,000 feet in length and the street serves no more than 18 dwellings. Section (5) through (11) discuss standards for future extension of streets, intersections, improvements to existing streets, street names, frontage streets, alleys and features prohibited in public streets.
- Section 42 B, Blocks, contains a block size standard of no greater than 1,000 feet in length between street corner lines unless it is adjacent to an arterial street or unless topography or the location of other streets require other connections. The recommended minimum length of blocks along an arterial is 2,000 feet.

Section 43. Improvement Specifications

This section specifies that the County Public Works Department shall prepare specifications to supplement the standards in this ordinance. (See Tillamook County Public Road Improvement Ordinance.)

3.4 Tillamook County Public Road Improvement Ordinance

(1999)

The purpose of the Tillamook County Public Road Improvement Ordinance is to provide standards for road development located outside of established Urban Growth Boundaries but within Tillamook County. The Ordinance identifies the following documents as reference documents:

- County Road Acceptance Ordinance
- Regulations for Utilities in Tillamook County Public Road Rights-of-Way
- Road Approach Ordinance

Relevant sections of the ordinance are summarized as follows:

Section 2. Definitions

This section includes definitions related to transportation facilities and improvements as the following: Average Daily Traffic (ADT); Private Road or Street; Public Road; Right-of-Way; Road (including street, highway, lane, alley, place, way, avenue or similar designation); road approach; roadway; sidewalk.

Section 11. Standards

This section specifies standards for development of roadways identified in the Road Improvement Standard Roadway Section, including the standards for Average Daily Traffic per roadway type, Minimum Roadway Section, Materials Specifications, Signage, Drainage, Road Approach standards, Future Land Divisions, Utilities, Acceptance as a County Maintained Road, City limits and Urban Growth Boundaries and Additional Standards.

Section 12. Variance

Describes criteria for a variance from the roadway standards.

Exhibits A and B. Roadway Section

Exhibits A and B of this Ordinance are illustrations of a "Standard Roadway Section" and a "Minimum Roadway Section," respectively. The Standard Roadway Section would be constructed to the standards of the AASHTO (American Association of State Highways and Transportation Officials) Manual.

3.5 Tillamook County Urban Growth Management Agreements

(Adopted December 1996)

Summary and Relevance to Proposed Plan

Tillamook County has adopted Urban Growth Management Agreements with each of the seven incorporated cities in the County. The purpose of the agreements are to provide for coordination of services in the City-County "mutual interest area," defined as the unincorporated lands within the each city's urban growth boundary. These are "urbanizable" lands located in unincorporated Tillamook County. By definition, these lands are: 1) determined to be necessarily and suitable for future urban area; 2) can be served by public facilities and services; and 3) are needed for the expansion of the urban area.

Relevant Policies and Recommendations

- Section 4(A): County Actions. The County shall coordinate with and seek comments from the City regarding the following items, for which the County has ultimate decision making authority and which affect land use within the Mutual Interest Area:
 - Major improvement projects sponsored by the County for transportation, drainage or solid waste improvements.

-
- County road vacations
 - Section 4(B): City Actions. The City shall coordinate with and seek comments from the County regarding the following items, for which the City has ultimate decision making authority, and which affect land use within the Mutual Interest Area.
 - Major improvement projects sponsored by the City for transportation, drainage or solid waste improvements.
 - Proposal for the extension of any City service, utility or facility or their respective service areas.
 - Section 6: City Annexations.
 - B. Upon annexation the County shall retain jurisdiction of the County road unless jurisdiction is transferred under a separate road transfer agreement between the City and County.
 - Section 10: Issues to Be Evaluated.
 - The County and the City agree to evaluate the following issues by June 1996: A. The respective City and County road, street and storm drainage standards to determine the feasibility of adopting either: 1) A common policy about which standards (City or County) will be used under different circumstances; or 2) A common set of road, street and storm drainage standards to be used within the Mutual Interest Area.

Data Gaps and Policy Issues

- Determine whether there are updated agreements for the other six cities and to what extent the road standards issue was further evaluated as called for in the ordinance.
- Clarify how these agreements do or don't affect connectivity standards

3.6 Tillamook County Transportation District (TCTD)

TCTD provides bus service to the incorporated cities in Tillamook County. Bus route, schedule and facilities information will be reviewed as part of the development of the transportation plan. However, TCTD does not currently have a master plan or similar document available for review.

4. State of Oregon/ODOT

State plans relating to transportation planning are summarized below, along with notes on their relevance to the downtown transportation plan. The relevance of the state plans to the local plans relates primarily to the presence of state owned facilities (such as US 101) in each of the cities.

4.1 State Planning Goals (1973)

Summary

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals. The goals address citizen involvement, land use planning, agriculture, natural resources and open space, economic development, public facilities and services, transportation, energy conservation, and urbanization. The statewide goals are achieved through local comprehensive planning, of which transportation system plans must be made a part.

Relevance

The Transportation Planning Rule and the transportation system plans identified therein are results of implementation of the transportation goal (Goal 12), which reads: "Provide and encourage a safe, convenient and economic transportation system."

4.2 Transportation Planning Rule (OAR 660-012, adopted 1991)

Summary

OAR 660 Division 12, the Transportation Planning Rule (TPR), implements Oregon's Statewide Planning Goal 12 (Transportation) and promotes the development of safe, convenient, and economic transportation systems that reduce reliance on the automobile. The TPR requires the preparation of regional transportation systems plans by metropolitan planning organizations (MPOs) or counties and local TSPs by counties and cities. TSP requirements vary by type (regional vs. local) and community size. Through TSPs, the TPR provides a means for regional and local jurisdictions to identify long-range (20-year) strategies for the development of local transportation facilities and services for all modes, to integrate transportation and land use, to provide a basis for land use and transportation decision-making, and to identify projects for the State Transportation Improvement Program. TSPs need to be consistent with the State Transportation Plan and its modal and multimodal elements.

Relevance

The downtown transportation plans will be generally consistent with the TPR. These plans are being prepared in lieu of full transportation system plans (TSPs), focusing instead on the most critical issues for each city. Because of their small size, each of the cities is eligible for an exemption from preparing a TSP. TSP exemptions will be prepared as part of each plan.

4.3 Oregon Transportation Plan (1992)

Summary

The Oregon Transportation Plan (OTP) is a policy document developed by ODOT in response to federal and state mandates for systematic planning for the future of Oregon's transportation system. It recognizes the need to integrate all modes of transportation and encourages the use of the mode that is the most appropriate for each type of travel. The Plan defines goals, policies and actions for the state for the next 40 years. The Plan's System Element identifies a coordinated multimodal transportation system, to be developed over the next 20 years, which is intended to implement the goals and policies of the Plan. The

goals and policies of the OTP cover a broad range of issues. The goals and policies are as follows:

- Goal 1: Characteristics of the System
 - Policy 1A – Balance
 - Policy 1B – Efficiency
 - Policy 1C – Accessibility
 - Policy 1D – Environmental Responsibility
 - Policy 1E – Connectivity among Places
 - Policy 1F – Connectivity among Modes and Carriers
 - Policy 1G – Safety
 - Policy 1H – Financial Stability
- Goal 2: Livability
 - Policy 2A – Land Use
 - Policy 2B – Urban Accessibility
 - Policy 2C – Relationship of Interurban and Urban Mobility
 - Policy 2D – Facilities for Pedestrians and Bicyclists
 - Policy 2E – Minimum Levels of Service
 - Policy 2F – Rural Mobility
 - Policy 2G – Regional Differences
 - Policy 2H – Aesthetic Values
- Goal 3: Economic Development
 - Policy 3A – Balanced and Efficient Freight System
 - Policy 3B – Linkages to Markets
 - Policy 3C – Expanding System Capacity
 - Policy 3D – Intermodal Hubs
 - Policy 3E – Tourism
- Goal 4: Implementation
 - Policy 4A – Adequate Funding
 - Policy 4B – Efficient and Effective Improvements
 - Policy 4C – Cost and Benefit Relationships
 - Policy 4D – Flexibility
 - Policy 4E – Achievement of State Goals
 - Policy 4F – Equity
 - Policy 4G – Management Practices
 - Policy 4H – Research and Technology Transfer
 - Policy 4I – State Responsibilities
 - Policy 4J – MPO and Other Regional Responsibilities
 - Policy 4K – Local Government Responsibilities
 - Policy 4L – Federal and Indian Tribal Governmental Relationships
 - Policy 4M – Private/Public Partnership
 - Policy 4N – Public Participation
 - Policy 4O – Public Information and Education

Relevance

The primary relevance of the OTP to local plans is consistency. This is stated in Policy 4K – Local Government Responsibilities as follows:

- Local governments shall define a transportation system of local significance adequate to meet identified needs for the movement of people and goods to local destinations within their jurisdictions; and
- Local government transportation plans shall be consistent with regional transportation plans and adopted elements of the state transportation system plan.

4.4 Oregon Highway Plan (1999)

Summary

The 1999 Oregon Highway Plan (OHP) is the highway modal element of the Oregon Transportation Plan. The OHP defines the policies and investment strategies for Oregon's state highway system over the next 20 years. Regional and local transportation system plans (TSPs) must be consistent with the State Transportation System Plan, which includes the OHP. Goal 1 addresses System Definition, Goal 2 System Management, Goal 3 Access Management, and Goal 4 Travel Alternatives. OHP policies under each of these Goals, potentially applicable to the downtown transportation plans, are as follows:

- **Policy 1A: State Highway Classification System.** The state highway classification system includes six classifications: Interstate, Statewide, Regional, District, Local Interest Roads, and Expressways. US 101 is designated a Statewide NHS highway.
- **Policy 1B: Land Use and Transportation.** This policy recognizes the role of both state and local governments regarding the state highway system and calls for a coordinated approach to land use and transportation planning. The policy identifies the designation of highway segments as Special Transportation Areas (STAs), Commercial Centers, and Urban Business Areas (UBAs). Within STAs and UBAs, highways may be managed to provide a greater level of access to businesses and residences than might otherwise be allowed. Commercial Centers encourage clustered development with limited access to a state highway.
- **Policy 1C: State Highway Freight System.** This policy calls for balancing the need to move freight with other highway users by minimizing congestion on major truck routes. US 101 is not a designated State freight route.
- **Policy 1D: Scenic Byways.** This policy promotes the preservation and enhancement of scenic byways by considering aesthetic and design elements along with safety and performance considerations on designated byways. US 101 is a National Scenic Byway.
- **Policy 1F: Highway Mobility Standards Access Management Policy.** This policy provides specific mobility standards for the state highway sections, signalized intersections, and interchanges. Alternative standards are provided for certain locations and under certain conditions. Inside Urban Growth Boundaries, maximum Volume to Capacity (V/C) Ratios for US 101, a Statewide non-freight route, are 0.90 within a

designated STA , 0.80 where the speed limit is under 45 mph, and 0.75 where the speed limit is over 45 mph.

- **Policy 1G: Major Improvements.** This policy identifies the state's priorities for responding to highway needs: protect the existing system and improve efficiency and capacity of existing system before adding capacity to the existing system.
- **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.
- **Policy 2F: Traffic Safety.** This policy emphasizes the state's efforts to improve safety of all users of the state highway system. Action 2F.4 addresses the development and implementation of the Safety Management System to target resources to sites with the most significant safety issues.
- **Policy 2G: Rail and Highway Compatibility.** This policy emphasizes increasing safety and efficiency through reduction and prevention of conflicts between railroad and highway users. Action items call for eliminating or reducing at grade rail crossings.
- **Policy 3A: Classification and Spacing Standards.** This policy addresses the location, spacing and type of road and street intersections and approach roads on state highways. It includes standards for each highway classification, including specific standards for Special Transportation Areas (STAs) and Urban Business Areas (UBAs).
- **Policy 3B: Medians.** This policy establishes the state's criteria for the placement of medians.
- **Policy 4A: Efficiency of Freight Movement.** This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system.
- **Investment Policy:** This policy identifies ODOT's priority to invest in managing and preserving the existing highway system and maintaining its safety.

A separate document, the Oregon Highway Plan Implementation Handbook, contains information interpreting the application of policies and actions in the OHP, particularly relating to land use and transportation policy. It includes tables and figures illustrating the OHP access management policies and the Access Management Rule (OAR 734-051). The Handbook does not provide any policy direction not contained in other plans, policies, or rules.

Relevance

Any proposed changes to US 101 must be consistent with the OHP. As noted above, the OHP describes requirements and process for establishing STAs and other special highway designations on state facilities, and sets forth standards for the performance, design, and access management of State Highways.

4.5 Draft Oregon Rail Plan (2001)

Summary

The 2001 Draft Oregon Rail Plan identifies federal and state policies applicable to passenger and freight rail planning. However, the plan does not identify any additional policies specific to the plan. The freight element describes existing conditions in the different regions of the state and improvements that are needed. It also identifies issues that should be considered in rail planning during local land use and transportation planning, such as preparation of Comprehensive Plan policies to support a Transportation System Plan.

The passenger element identifies the need or feasibility of certain passenger and commuter rail improvements. The plan identifies the following funding needs for the Port of Tillamook Bay rail line: tunnel repair, bridge repair, rail renewal, locomotive acquisition, debt refinance, maintenance equipment acquisition. The plan also suggests criteria for determining if an area could support a commuter rail line.

Relevance

Where rail lines are possibly affected, the downtown plans should reflect the importance of maintaining the freight and passenger rail system.

4.6 Oregon Public Transportation Plan (1997)

Summary

The Oregon Public Transportation Plan (OPTP) forms the transit modal plan of the Oregon Transportation Plan. The vision guiding the plan is as follows:

- A comprehensive, interconnected and dependable public transportation system, with stable funding, that provides access and mobility in and between communities of Oregon in a convenient, reliable and safe manner that encourages people to ride
- A public transportation system that provides appropriate service in each area of the state, including service in urban areas that is an attractive alternative to the single-occupant vehicle, and high-quality, dependable service in suburban, rural, and frontier (remote) areas
- A system that enables those who do not drive to meet their daily needs
- A public transportation system that plays a critical role in improving the livability and economic prosperity for Oregonians.

The plan contains goals, policies, and strategies relating to the whole of the state's public transportation system. The plan is intended to provide guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The OPTP also identifies minimum levels of service, by size of jurisdiction, for fulfilling its goals and policies.

Relevance

Transit service in Tillamook County is provided by the Tillamook County Transportation District; the level of service of this system will be addressed at the County level (e.g., in the County Transportation System Plan). Public transportation facilities (i.e., bus stops) will be reviewed for each of the downtown plans.

4.7 Oregon Bicycle and Pedestrian Plan (1995)

Summary

The Oregon Bicycle and Pedestrian Plan provides guidance to regional and local jurisdictions for the development of safe, connected bicycle and pedestrian systems. The plan is a modal element of the Oregon Transportation Plan. The plan includes two major sections: policies and implementation strategies; and design, maintenance and safety information. The plan also outlines the elements of the bicycle and pedestrian plan required for transportation system plans. The goal of the plan is "To provide safe, accessible and convenient bicycling and walking facilities and to support and encourage increased levels of bicycling and walking."

Relevance

This Bicycle and Pedestrian Plan applies to state-owned facilities in Tillamook County, such as US 101, which is a designated State Bike Route. Any changes to the state bike route must be consistent with ODOT policies.

4.8 Oregon Transportation Safety Action Plan (1995)

Summary

The Oregon Transportation Safety Action Plan forms the safety element of the Oregon Transportation Plan (OTP). The intent of the plan is to improve safety on Oregon's highways for all users. The plan was prepared in response to the safety policy (Policy 1G) in the OTP: "It is the policy of the State of Oregon to improve continually the safety of all facets of statewide transportation for system users including operators, passengers, pedestrian, recipients of goods and services, and property owners."

The plan contains 70 actions that form a 20-year safety agenda. Many of the actions are programmatic in nature and may not be reasonably addressed through local transportation plans.

Relevance

The following actions potentially could be relevant to the downtown transportation plans:

- Action 19 – Safety Considerations in Transportation Planning Documents
- Action 20 – Access Management
- Action 64 – Rail Crossing Safety
- Action 66 – Pedestrian Safety

4.9 Access Management Rules (OAR 734-051)

Summary

The stated purpose of these rules is to govern the issuance of permits for approaches onto state highways. The rules promote the protection of emerging developed areas rather than the retrofit of existing built-up roadways. The rules also provide access management spacing standards for approaches for various types of state roadways and for interchanges. OAR 734-051-0190 specifies that these standards are to be used in planning processes involving state highways, including corridor studies, refinement plans, state and local TSPs, and local comprehensive plans. The access management rules also include provisions for UBAs, and STAs, as discussed in the OHP. The access management rules describe the development of access facility management plans and interchange area management plans.

Relevance

Because these rules apply to all roadways under state jurisdiction, they are of critical importance for the downtown plans, all of which include US 101 in their study areas. Any changes to access onto US 101 (including consideration of STAs) must be consistent with the Access Management Rules. These plans should include measures to implement the Access Management Rule.

4.10 Freight Moves the Oregon Economy (1999)

Summary

This plan's stated purpose is to demonstrate the importance of freight to the Oregon economy and identify concerns and needs regarding the maintenance and enhancement of current and future mobility in the state of Oregon. The plan discusses the relationship among freight, the economy, and transportation planning, as well as road, rail, waterway, and pipeline facilities, and intermodal facilities. It does not identify specific freight policies to be addressed by transportation system plans or facility plans.

Relevance

The primary north-south through freight route in Oregon is I-5. US 101 serves regional and local freight needs. This plan suggests the importance of maintaining efficient through traffic movement on US 101.

4.11 Proposed Oregon Coast Highway Corridor Master Plan

(ODOT, January 1995)

Summary and Relevance to Proposed Plan

- A vision to develop an aesthetic corridor with utilitarian purposes. A route to be admired by tourists and recreational users, while remaining the principle route for commercial and industrial traffic along the coast.
- Goals of the plan include:
 - Develop a plan that integrates interests of ODOT, communities, and other jurisdictions
 - Manage future transportation needs and useful life of the highway

- Incorporate inherent scenic resources of the area with the highway
- Support individual character of communities adjacent to the highway
- Support sustainable economic diversity and responsibility

Relevant Policies and Recommendations

- The following are corridor-wide recommendations:
 - Intercity Services: commercial bus service provided to all cities with a population over 2,500, or a group of communities located within five miles of one another and a combined population greater than 2,500, with at least one daily stop in each direction (p. II 1-2)
 - Intermodal Services: direct connections between inter-city buses and air service; provide natural gas every 100-150 miles to support alternative fuel use (p. II 2-3)
 - Road Capacity: manage capacity through access management and lane construction; provide additional capacity in urban areas of population growth; in designated Special Highway Landscape areas construct only if project has a positive impact on scenic resources; operate at level of service B or better in off-peak periods (p. II 4)
 - Access Management: motorists should be made aware of the most efficient route between the coast and inland destinations; better informing of travel distances and speeds to motorists (p. II 7-8)
 - Resources: Resources: development of a vegetation management plan; include vegetation to enhance community streetscapes; develop "gateways" to each city (p. II 8-9)
 - Bicycle and Pedestrian Facilities: future projects should have a bike lane in each direction; integrate bicycle facilities with community systems; improve pedestrian access (p. II 10-11)
 - Other Improvement Activities: bypasses/alternative routes; parking plans; interpretive centers; scenic overlooks/loops; exploring transit, rail, and air services (p. II 15-23)
- The following are recommendations for Tillamook County:
 - Manzanita to Wheeler: improve safety of Manzanita junction; improve local parallel street system; improve transit system; develop access management plan; develop a plan to incorporate parking, pedestrian, landscape, and signage needs (p. II 39-40)
 - South Wheeler, Rockaway, and Garibaldi: develop access management plan; identify scenic areas; improve Brighton slide area stability; develop a plan to incorporate parking, pedestrian, landscape, bicycle, and signage needs; use frontage road in Rockaway as additional travel lanes; improve transit system; in Garibaldi investigate Miami River Road as a possible bypass and access management (p. II 41-42)
 - South Garibaldi, Bay City, and north Tillamook: identify passing lane locations; investigate access management, turn lanes, and local street system improvements in Bay City; improve transit system; incorporate pedestrian and bicycle use (p. II 43)
 - Tillamook: investigate access management; incorporate pedestrian and bicycle use; create Coast Highway interpretive center; develop byway to the east; develop frontage road system; develop a plan to incorporate parking, pedestrian, landscape, bicycle, and signage needs; improve junction of US 101 and Highway 6 (p. II 44-45)
- The following are implementation strategies for the plan:
 - Bicycle and pedestrian improvements will be included with all capacity improvements (p. III 2)

-
- ODOT will prepare a Visual Resource Plan, identifying potential scenic features and signing programs (p. III 2)
 - Improvements will enhance the environment adjacent to the highway (p. III 3)

Data Gaps and Policy Issues

- For each city, identify priorities among the following common themes:
 - Parking, pedestrian, bicycle, landscaping, and signage needs
 - Investigation of access management
 - Improved transit system

4.12 Pacific Coast Scenic Byway Corridor Management Plan for US 101 in Oregon

(ODOT, December 1997)

Summary and Relevance to Proposed Plan

- Benefits of the plan include:
 - Improved coordination between agencies working to improve visitor experience and quality of life
 - Identification and prioritization of improvement projects
 - Utility as a resource for information
 - Serve as an application for designation as a National Scenic Byway
- Mission to develop a community-based plan that will maintain or enhance characteristics that are essential to the Pacific Coast Scenic Byway experience
- This document is the guidance manual for separate regional management plan documents

Relevant Policies and Recommendations

- Nehalem Region (p. 47-52):
 - Nine *defining features* that are valued most while travelling the corridor
 - Eleven *contributing features* that significantly add to the regional experience
 - Six *recognized features* that enhance the overall regional experience
- Tillamook Region (p. 53-58):
 - Seven *defining features*
 - Twelve *contributing features*
 - Sixteen *recognized features*
- The features described for each region are described in greater detail in the regional management plan discussed below.

Data Gaps and Policy Issues

- None identified

4.13 Scenic Byway Management Plan for the Nehalem, Tillamook, and Nestucca Regions of the U.S. 101 Corridor in Oregon

(ODOT, December 1997)

Summary and Relevance to Proposed Plan

- Presents detailed descriptions of the features outlined in the *Pacific Coast Scenic Byway Corridor Management Plan for U.S. 101 in Oregon*
- Management strategies and suggested projects are described
- Identification of priority projects

Relevant Policies and Recommendations

The following recommendations are associated with the *defining features* within the city limits for the cities addressed by these projects. Many of the features identified in the scenic byway plan are state or county parks; it is assumed that recommendations in the plan for these facilities are generally outside the city's jurisdictions.

- Nehalem Region
 - City of Nehalem (p. 32-33):
 - Provide signage and tourist documents
 - Inventory, document, and develop interpretive panels for historic sites
 - View at Nehalem River Bridge (p. 34-35):
 - Provide signage and turnouts
 - City of Rockaway Beach (p. 41-44):
 - Selectively remove vegetation to improve view and implement streetscape plan
 - Identify roadway runoff problems
 - Improve public amenities
 - Reduce US 101 speed in town and improve north-south streets for local traffic
 - Design roadway features (lighting, retaining walls, guard rails) consistent with community
 - Designate US 101 from south Garibaldi to Nehalem Bridge as natural corridor
 - Design interpretive signs and kiosks with interpretive trails
 - Provide off-highway parking, pedestrian access, and turnoffs for resources
 - Nehalem bay and estuaries wildlife viewing (p. 55-56)
 - Provide parking and turnout areas
 - Provide interpretive signs or kiosks
 - Priority or selected projects (p. 65-67):
 - Nehalem bay and estuary wildlife viewing improvements
 - Nehalem River Bridge viewing improvements
- Tillamook Region
 - Tillamook County Pioneer Museum and Cultural Center, Bay City site (p. 94-96)
 - Provide parking facilities and signage
 - Develop turning lane over railroad tracks

Data Gaps and Policy Issues

As previously indicated, only *defining features* are discussed above. Other *contributing* or *recognized features* exist in the area and although their contribution to scenic qualities of US 101 is less significant, they are additional resources to consider in policy development.

5. United States

5.1 Transportation Equity Act for the 21st Century (TEA-21) and Implementing Regulations (23 CFR 450 and 49 CFR 613)

Federal transportation planning requirements, such as those in the TEA-21 and its implementing regulations, are addressed through state and local plans (see above).

APPENDIX C

Existing Conditions and Traffic Data

Part 1
Field Measurements

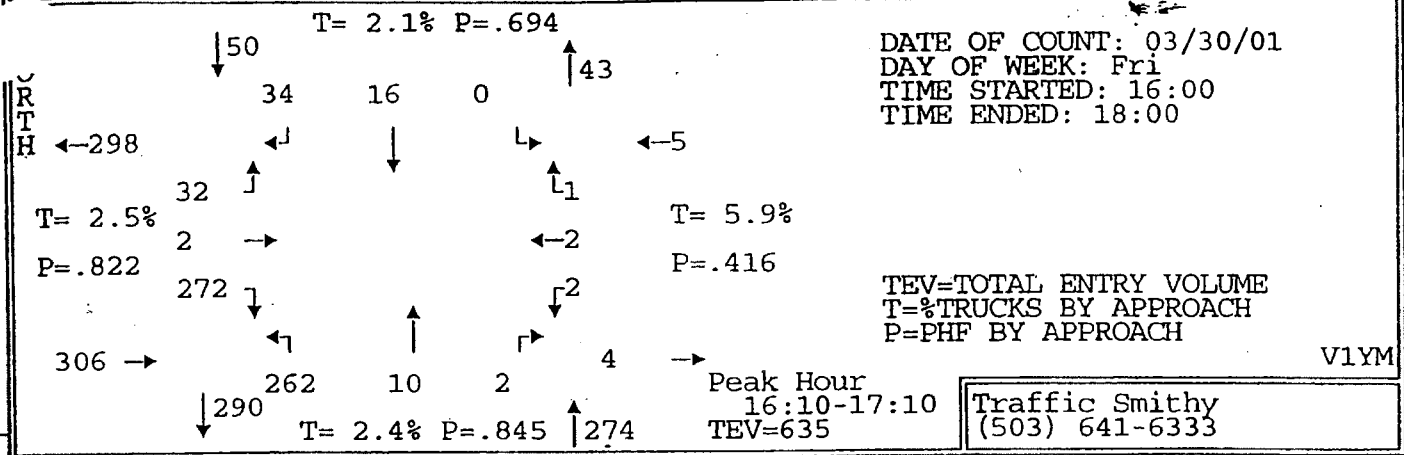
Nehalem Field Measurements

STREETS

Street	Cross Street	Roadway Cross Section				Pedestrian Amenities
		Parking Lane (ft)	Lane (ft)	Lane (ft)	Parking/ Shoulder (ft)	Sidewalks
Riverside	Tohls	8	14	14	8	6
Tohls	Riverside	8	13.5	13.5	8	5
H	7th	8	10.5/10.5	11.5	8	6
7th	B		11.5	11.5		5
B	7th		20			5
8th	B		18			
8th	H		22			
8th	Tohls		24			
Tohls	8th		30			
9th	A		20			
10th	B		14 (gravel)			
10th	A		34			
10th	Tohls		24			

Part 2
Raw Traffic Counts

**INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
HIGHWAY 101 AT NORTH FORK ROAD**



TIME PERIOD FROM - TO	EAST BOUND			SOUTH BOUND			NORTH BOUND			WEST BOUND			ALL
	↓	→	↑	↙	↓	↘	↖	↑	↗	↓	←	↑	
16:00-16:05	25	0	4	1	2	1	11	1	2	0	1	0	48
16:05-16:10	21	0	4	2	2	0	22	0	2	1	0	0	54
16:10-16:15	30	0	2	3	2	0	19	1	0	0	0	0	57
16:15-16:20	21	0	5	4	0	0	24	2	0	0	0	0	56
16:20-16:25	29	0	6	0	1	0	23	0	0	0	0	0	59
16:25-16:30	14	1	2	5	4	0	19	0	0	1	0	0	46
16:30-16:35	26	0	0	4	2	0	19	0	0	0	0	0	51
16:35-16:40	26	0	2	2	1	0	10	1	1	0	1	0	44
16:40-16:45	16	1	3	8	0	0	19	0	0	0	0	1	48
16:45-16:50	22	0	1	2	1	0	37	2	0	0	1	0	66
16:50-16:55	22	0	3	1	1	0	16	0	0	1	0	0	44
16:55-17:00	21	0	1	1	1	0	24	2	0	0	0	0	50
17:00-17:05	24	0	2	1	1	0	24	1	0	0	0	0	53
17:05-17:10	21	0	5	3	2	0	28	1	1	0	0	0	61
17:10-17:15	16	1	3	1	0	0	14	0	2	1	2	0	40
17:15-17:20	13	0	4	2	3	0	24	1	0	1	2	0	50
17:20-17:25	19	0	4	1	5	0	13	2	0	1	0	0	45
17:25-17:30	11	0	4	1	1	1	11	1	1	0	0	0	31
17:30-17:35	14	1	0	2	2	0	17	6	0	0	0	0	42
17:35-17:40	23	0	3	2	1	0	16	2	0	0	0	0	47
17:40-17:45	15	0	1	3	2	0	20	3	0	2	0	0	46
17:45-17:50	24	0	2	1	1	0	23	0	0	1	0	0	52
17:50-17:55	14	0	2	1	1	0	18	1	1	0	0	0	38
17:55-18:00	17	0	3	3	2	0	13	0	0	0	0	0	38

Peak Hour

Total Survey	484	4	66	54	38	2	464	27	10	9	7	1	1166
PHF	.85	.5	.62	.61	.57	0	.85	.63	.5	.5	.25	.25	.922
% Trucks	1.7	25	7.6	1.9	0	50	2.4	3.7	0	0	14.3	0	2.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	45	0	0	0	0	0	0	0	0	8	0	0

Hourly Totals													
15:00-17:00	273	2	33	33	17	1	243	9	5	3	3	1	623
16:15-17:15	258	3	33	32	14	0	257	9	4	3	4	1	618
16:30-17:30	237	2	32	27	18	1	239	11	5	4	6	1	583
16:45-17:45	221	2	31	20	20	1	244	21	4	6	5	0	575
17:00-18:00	211	2	33	21	21	1	221	18	5	6	4	0	543

Part 3
Growth Rate Calculations

Growth Rate Calculations - Source: ODOT Website Transportation Volume Tables

Hwy 101 - Manzanita

MP	1997 ADT	2019 ADT	Number of years	Factor for 22 years	1 year growth
43.08	4600	6600	22	1.43	0.020
43.19	5800	9600	22	1.66	0.030
Average Growth Rate					0.025

Hwy 101 - Nehalem

MP	1997 ADT	2019 ADT	Number of years	Factor for 22 years	1 year growth
44.73	5800	9500	22	1.64	0.029
44.97	5900	8900	22	1.51	0.023
44.99	5900	8800	22	1.49	0.022
45.53	5500	7400	22	1.35	0.016
Average Growth Rate					0.023

Hwy 101 - Rockaway Beach

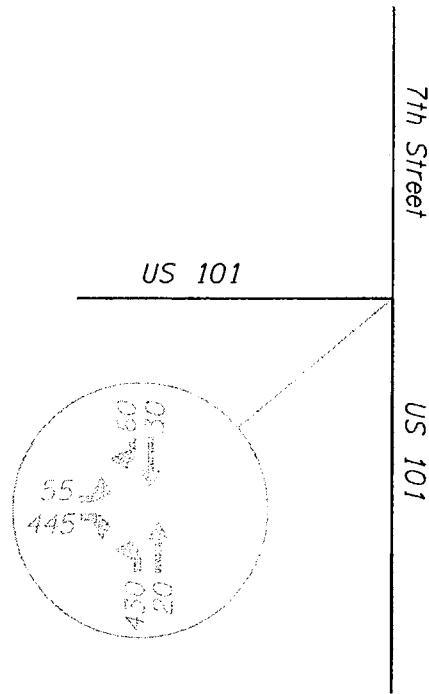
MP	1997 ADT	2019 ADT	Number of years	Factor for 22 years	1 year growth
49.26	4900	5500	22	1.12	0.006
50	5300	7000	22	1.32	0.015
50.86	6100	8400	22	1.38	0.017
50.88	6700	8700	22	1.30	0.014
51.77	6500	8600	22	1.32	0.015
Average Growth Rate					0.013

Hwy 101 - Bay City

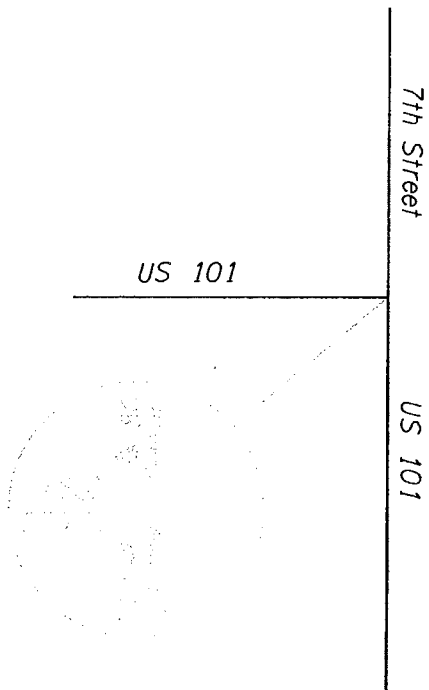
MP	1997 ADT	2019 ADT	Number of years	Factor for 22 years	1 year growth
59.21	8800	14800	22	1.68	0.031
59.89	8700	14200	22	1.63	0.029
60.08	8800	14100	22	1.60	0.027
60.1	9900	11800	22	1.19	0.009
60.34	9800	13300	22	1.36	0.016
61.07	9800	14000	22	1.43	0.019
Average Growth Rate					0.022

Part 4
2002 and 2022 30th-Highest-Hour Traffic Volumes

*Nehalem Downtown Plan
Existing 2002 and Forecasted
2022 30th Highest Hour Traffic Volumes*



2002 30th Highest Hour Volumes



Forecasted 2022 30th Highest Hour Volumes

Part 5
Level of Service Definitions

Nehalem Downtown Transportation Plan: Existing Conditions and Future Opportunities

Level-of-Service Definitions

Level of Service, based on average control delay, is defined for the intersection as a whole. Control delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the deceleration and acceleration delay, the stopped delay, the green ratio, and the v/c ratio for the lane group or approach in question. See below for traffic flow characteristics and delay ranges for each LOS.

Level of Service	Traffic Flow Characteristics
A	Level of service A describes operations with very low delay. This occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Level of service B describes operations with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Level of service C describes operations with slightly higher delays that may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Level of service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	Level of service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios (those over 1.00) with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Research Board, *Highway Capacity Manual*, Special Report No. 209, 2000

Nehalem Downtown Transportation Plan: Existing Conditions and Future Opportunities

LOS	Unsignalized Intersections (Control delay in seconds)	Signalized Intersections (Control delay in seconds)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Source: Highway Research Board, Highway Capacity Manual Update, Special Report No. 209, 2000.

Part 6
Existing Conditions Operational Analysis (Year 2002)

HCM Unsignalized Intersection Capacity Analysis
 3: US 101 (Nehalem) & 7th Street (North Fork Road)

02/05/2003



Movement	EBL	EBP	NBL	NBT	SEB	SEB
Lane Configurations	↑	↑		↑	↑	
Signal Control	Stop			Yield	Stop	
Volume (veh/h)	55	445	430	20	30	60
Peak Hour Factor	0.82	0.82	0.85	0.85	0.69	0.69
Hourly flow rate (veh/h)	67	543	506	24	43	87
Volume Total (vph)	67	543	529	130		
Volume Left (vph)	0	0	0	0		
Volume Right (vph)	0	543	0	87		
Reds (s)	0.2	0.6	0.2	0.4		
Departure Headway (s)	5.5	3.2	4.4	4.3		
Departure Utilization	0.10	0.48	0.09	0.15		
Capacity (veh/h)	586	1116	802	809		
Control Delay (s)	9.1	9.1	15.4	8.0		
Approach Delay (s)	9.1	9.1	15.4	8.0		
Approach LOS	A	A	C	A		
Delay			11.6			
HCM Level of Service			B			
Intersection Capacity Utilization			50.6%			
ICU Level of Service			A			

Part 7
Forecasted 2022 30th-Highest-Hour Traffic Volumes

HCM Unsignalized Intersection Capacity Analysis
 3: US 101 (Nehalem) & 7th Street (North Fork Road)

02/05/2003



Movement	EB1	EB2	NB1	NB2	SB1	SB2
Lane Configurations	↖	↗		↕	↕	
Sign Control	Stop			Yield	Stop	
Volume (veh/h)	75	630	610	25	40	80
Peak Hour Factor	0.82	0.82	0.85	0.85	0.69	0.69
Hourly flow rate (veh/h)	91	768	718	29	58	116

Approach	EB	EB2	NB	SB
Volume Total (vph)	91	768	747	174
Volume Left (vph)	91	0	0	0
Volume Right (vph)	0	768	0	116
Red (s)	0.2	0.6	0.2	0.4
Departure Headway (s)	6.1	3.2	4.6	4.6
Capacity Utilization	0.16	0.68	0.95	0.22
Capacity (veh/h)	560	1119	774	756
Control Delay (s)	10.3	12.8	12.8	8.9
Approach Delay (s)	12.5		42.8	8.9
Approach LOS	B		F	A

Delay			27.9	
HCM Level of Service			C	
Intersection Capacity Utilization			66.5%	
ICU Level of Service			B	

APPENDIX D

Roundabout Feasibility Study

Nehalem Downtown Transportation Plan: Roundabout Feasibility Study

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DATE: June 17, 2003

Introduction

This memorandum reports the results of a preliminary evaluation of the feasibility of a roundabout at the intersection of U.S. 101 and 7th Street (North Fork Road) in Nehalem, Oregon. It describes potential impacts and site criteria, as described in the 2002 ODOT Highway Design Manual and the FHWA Publication, *Roundabouts: An Informational Guide*. The memo also provides a planning level estimate of traffic operations performance as well as recommended design criteria, including the approximate diameter that would be required. This study was undertaken as part of the Nehalem Downtown Transportation Plan.

Background

One of the main areas of interest during the Nehalem Downtown Transportation Plan process was the intersection of U.S. 101 and 7th Street (North Fork Road) where U.S. 101 makes a 90-degree turn. As described in the plan, the unconventional traffic control at the intersection results in confusion for drivers, including the high percentage of tourist travelling along the Oregon Coast. The geometric constraints at the intersection do not accommodate turn movements by trucks or recreational vehicles. There are also pedestrian crossing concerns at the intersection due to high through volumes on US 101, the unconventional intersection configuration, and the uncontrolled northbound left turn movement.

Potential short-term and long-term solutions to address the deficiencies at this intersection are identified in the Nehalem Downtown Transportation Plan. A roundabout was one of the long-term solutions suggested by the consultant team as warranting further study. Based on preliminary discussions with city staff, the Project Advisory Committee, and the general

Roundabout Feasibility Study

public, there were a number of concerns about the potential adverse impacts of a roundabout. This feasibility study of the roundabout was conducted based on the city's desire to plan proactively for a long-term solution at this location that is supportive of city goals, and a desire by ODOT to determine whether a roundabout would address traffic needs and should be further considered at this location.

Modern Roundabouts

Modern roundabouts are gaining popularity in the United States and within the State of Oregon. A roundabout was recently constructed at the intersection of two state highways in the City of Astoria, located approximately 40 miles north of Nehalem on U.S. 101 at the junction with OR Highway 202.

As shown in Figure 1, roundabouts are a circular form of intersection control that include distinct design features. The raised central and splitter islands help define the geometry of the roundabout and regulate speeds through deflection. A mountable apron (curb) is often used to accommodate truck turn movements. Pedestrian and bicycle treatments also can be included in a roundabout to accommodate pedestrians and bicycles.

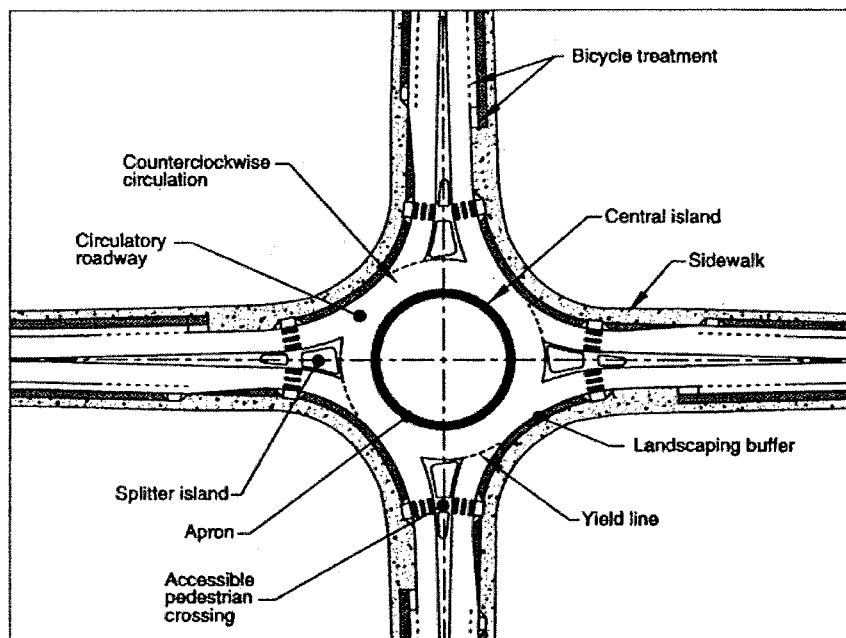


FIGURE 1

Roundabout Features

Source: Roundabouts: An Informational Guide (FHWA)

As with any type of intersection control, there are advantages and disadvantages associated with roundabouts. General advantages and disadvantages are described below. Potential impacts specific to a roundabout at the location of U.S. 101 and 7th Street (North Fork Road) are described in the next sections of this memorandum (Site Criteria, Considerations of Context, and Summary of Potential Impacts).

Advantages

- **Safety.** Roundabouts generally have lower crash rates and less severe accidents in comparison to conventional intersections.
- **Speed.** A well-designed roundabout encourages speed reduction and consistency, which contributes to the safety of an intersection. Roundabouts can act as a traffic calming measure by reducing speeds.
- **Delay.** Roundabouts generally have lower delay times in comparison to conventional intersections.
- **Aesthetics.** Roundabouts are generally more aesthetically pleasing than conventional intersections.
- **Operation and Maintenance Costs.** Roundabouts generally have lower operation and maintenance costs when compared with signalized intersections, which require electrical power and signal maintenance.

Disadvantages and Constraints

- **Right-of-Way Impacts.** Roundabouts generally require more space than conventional intersections and often have impacts on the corner properties surrounding the intersection.
- **Driver Education.** Roundabouts generally require driver education and awareness in areas where roundabouts are a new concept.
- **Visually Impaired Pedestrians.** Roundabouts have caused concern for visually impaired and/or blind pedestrians.

Site Criteria

The 2002 ODOT Highway Design Manual and the FHWA Roundabout Guide outline site criteria that should be evaluated to determine if a roundabout is appropriate at a given location. Table 1 compares the site criteria to the intersection of US 101 and 7th Street (North Fork Road). Shading is used to identify criteria that might not be met at the study intersection.

As stated in the FHWA Roundabout Guide, a roundabout may still be an appropriate solution at sites that do not meet all the criteria. In fact, roundabouts have been the preferred solution at sites that do not meet most of the criteria. The importance of each criteria at a given location should be reviewed when considering a roundabout. In addition, mitigation measures can be identified to address concerns.

Roundabout Feasibility Study

TABLE 1.
ODOT and FHWA Roundabout Site Criteria

Site Criteria	Notes
Would the roundabout have fewer than 4 approach legs?	Yes. The roundabout would have 3 approaches, with a driveway access to the east.
Would the roundabout have acceptable V/C ratios for the proposed design life?	Yes. The roundabout would operate adequately as a single-lane roundabout through the 20 year design horizon.
Is the posted speed less than 60 kph (35 mph)?	The speed limit in Nehalem varies between 45 mph and 30 mph, with a 30 mph speed limit at this intersection.
Would the roundabout have normal circular geometry?	Yes.
Would the roundabout have similar or balanced volumes on all approach legs?	The roundabout would have similar volumes on the U.S. 101 approaches. The 7 th Street (North Fork Road) approach volumes would be significantly less. The circulating volumes would be significantly less than the approach volumes (See Appendix 1).
Would the roundabout be located on the intersection of two roadways with similar functional classifications?	Yes. The roundabout would be located along U.S. 101 and 7 th Street (North Fork Road), which are classified as an arterial and collector, respectively.
Would the roundabout serve mostly commuter and local traffic?	No. The roundabout would serve commuter, local, and tourist traffic. Education would likely be necessary for trucks, tourist traffic, and local traffic.
Would the roundabout have low pedestrian volumes?	Pedestrian volumes were not available for this analysis. The intersection is located in the downtown area and striped crosswalks are currently provided at this intersection. Due to the active storefront development along U.S. 101, including a variety of destinations and services, this intersection will likely experience increases in pedestrian usage through the 20-year horizon. Under existing conditions, pedestrians experience difficulty crossing US 101 due to high, uncontrolled, through traffic volumes. A roundabout would provide designated crossing locations with a refuge area in the splitter island to help alleviate crossing concerns.
Would the roundabout have low bicycle volumes?	Bicycle volumes were not available for this analysis. The intersection is located in the downtown area and will experience local bicycle usage. In addition, the intersection is located along US 101, which is designated as the Oregon Coast Bike Route. This route experiences moderate bicycle traffic, particularly southbound, during the summer months. Bicycle treatments as detailed in the 2002 ODOT Design Manual would likely be included in the design to accommodate bicycle traffic.
Would the roundabout have low truck volumes?	U.S. 101 experiences approximately 6% heavy vehicles (as measured at the Rockaway Automated Traffic Recorder (ATR) in year 2002, including single unit trucks, buses, single trailer trucks, and double trailer trucks). The City of Nehalem is concerned about truck turning movements at this intersection. A truck apron could be included in the design to ensure that trucks are able to maneuver through the roundabout.
Would the roundabout be located within an interconnected signal system?	No.

<p>Would the roundabout be located near signals, railroads, drawbridges, or other locations where vehicle operations would be interrupted?</p>	<p>No.</p>
<p>Would the roundabout be located where grades or topography would limit visibility or complicate construction?</p>	<p>No. There are no grade or topography issues. The intersection currently experiences drainage issues (flooding) that would need to be addressed.</p>
<p>Are there physical or geometric constraints that make it impossible or uneconomical to construct a roundabout (right-of-way, utilities, etc.)?</p>	<p>There would likely be right-of-way impacts to surrounding property owners (including impacts to existing buildings) if a roundabout were centered in the existing right-of-way. (Impacts would likely be less if an offset roundabout were constructed.) In addition, a roundabout would likely reduce the availability of on-street and off-street parking. The intersection currently experiences drainage issues (flooding) that would need to be addressed. An offset roundabout would likely be required at this intersection to minimize impacts to surrounding property owners.</p>

Considerations of Context

The FHWA Publication titled *Roundabouts: An Informational Guide* includes considerations of context that should be evaluated to determine if a roundabout is appropriate at a given location. One of the considerations is the degree to which a roundabout would be a new feature in the area. There are no existing roundabouts in Nehalem or Tillamook County. The closest roundabout, which was constructed recently, is located 40 miles north in Astoria at the junction of US 101 and OR 202. As a result, a number of drivers in Nehalem would likely have some experience navigating a roundabout. However, for a roundabout to be feasible in this location, ODOT and the City of Nehalem would need to gain public and community support. To gain public acceptance in an area with few or no existing roundabouts, greater education and justification efforts may be necessary.

Performance

Existing and Future Forecasted No-Build Conditions

As part of the Nehalem Downtown Transportation Plan, an operational analysis of existing (2002) and future forecasted (2022) no-build conditions was conducted using a software package based on the Highway Capacity Manual. The analysis assumes that traffic volumes will increase by 2.3% per year along US 101 within the city limits of Nehalem during the 20-year design horizon. The analysis was conducted for 30th highest hour conditions, which represent traffic volumes on a typical weekend afternoon in July or August to account for the high levels of seasonal traffic. The results of the operational analysis were compared with the appropriate mobility standard in the Oregon Highway Plan, which is a maximum v/c ratio of 0.85. See Appendix 1 for the existing (2002) and future forecasted (2022) no-build 30th highest hour volumes for this intersection that were developed as part of the Nehalem Downtown Transportation Plan.

The intersection of US 101 with 7th Street/North Fork Road has unique operating conditions. Northbound turn movements (US 101) are free (unrestricted), as drivers are not forced to yield to drivers on other approaches. Eastbound left turn movements are stop-controlled

and eastbound right turn movements are free. Within Synchro and HCS2000, it is not possible to model these exact operating conditions.

To approximate the operating conditions at this intersection, two configurations were modeled using Synchro, Version 5, as part of the Nehalem Downtown Plan. The first configuration, which included a yield sign on the northbound approach, would underestimate the operating performance of the intersection (i.e., the operating conditions would likely be better than the results included in the report). The second configuration modeled US 101 as a straight roadway, with the minor movements from 7th Street/North Fork Road intersecting US 101. The second configuration would likely overstate the operating performance of the intersection (i.e., the operating conditions would likely be worse than the results included in the report). As reported in the Nehalem Downtown Plan, the intersection would meet OHP mobility standards under 30th highest hour existing conditions with both configurations. However, at least one movement would not meet OHP mobility standards under future forecasted no-build 30th highest hour conditions with both configurations. (See the Nehalem Downtown Plan for additional information about the operational analysis of no-build conditions.)

The current geometry of the intersection also results in vehicle delays not represented in the traffic models. Specifically, trucks and other large vehicle on U.S. 101 often must wait for an opposing vehicle to clear the intersection because there is not enough space for truck turning movements.

Roundabout Performance and Methodology

Using the FHWA Publication titled *Roundabouts: An Informational Guide*, a planning level operational analysis was conducted for a potential roundabout at the location of US 101 and 7th Street (North Fork Road). As described in this publication, the operational performance of a roundabout is based on the circulating and entry volumes, roundabout geometry, and gap acceptance characteristics. The OHP mobility standard for US 101 in Nehalem matches the maximum recommended v/c ratio in the FHWA Roundabout Guide (v/c ratio of 0.85).

Using the 2002 and 2022 turn movement volumes from the Nehalem Downtown Transportation Plan, circulating and entering traffic volumes were estimated for a potential roundabout in this location (see Appendix 1). The volumes were adjusted as described in the FHWA Roundabout Guide to passenger car equivalents (this analysis assumed 94% passenger cars, 2% trucks, and 4% SU/RV/bus traffic) and to peak 15-minute volumes using the peak hour factors measured during the original turn movement counts.

One of the important design considerations for a potential roundabout is the number of lanes. The FHWA Roundabout Guide includes capacity information for both double and single lane roundabouts. Exhibit 4-3 in the FHWA Roundabout Guide was used to determine that a single-lane roundabout would perform adequately at this location under both existing (2002) and future forecasted (2022) 30th highest hour conditions. The maximum v/c ratio that was calculated under future forecasted conditions was 0.75, which is below the OHP mobility standard for US 101 and the maximum recommended v/c ratio in the FHWA Roundabout Guide. As demonstrated by this analysis, a roundabout in this location would likely operate better than the existing intersection, with lower v/c ratios and delay at the intersection.

Intersection Safety

A safety analysis of this intersection and US 101 in downtown Nehalem was performed as part of the Nehalem Downtown Plan based upon reported accidents to ODOT. Within the 5-year period, there were 4 total accidents at the intersection. All of the 4 accidents occurred on the entering approaches to the intersection and resulted in injuries. Two of the accidents were rear-end accidents and the two other accidents involved illegal U-turns on US 101. The calculated crash rate of 0.31 accidents per million vehicle miles does not indicate a safety issue at this intersection. However, a roundabout at this intersection would likely decrease the overall severity of accidents and reduce or eliminate accidents contributed to illegal U-turns.

Design Criteria and Conceptual Layout

The following design criteria, as described in the FHWA Roundabout Guide and the 2002 ODOT Design Manual, are recommended for a potential roundabout in Nehalem.

TABLE 2.
Roundabout Design Criteria

Variable	Min	Max	Source
Truck Apron	1 m	4 m	FHWA
Splitter Island Length	15 m	N/A	ODOT Design Manual
Exit Radius- Single Lane	15 m	N/A	FHWA
Entry Radius	10 m	30 m	FHWA
Circulatory Roadway Width	6.5 m	N/A	ODOT Design Manual
Inscribed Circle Diameter	50 m	N/A	ODOT Design Manual
Entry Design Speed	N/A	25 mph	FHWA and ODOT Design Manual
Design Vehicle	Interstate Design Vehicle (WB-67)	N/A	ODOT Design Manual
Profile Grades	N/A	4%	FHWA
Superelevation	Normal Crown		FHWA

A conceptual roundabout configuration was prepared using the design criteria in Table 2 to illustrate how a roundabout at this location might be designed. The conceptual configuration presents an offset roundabout that minimizes impacts to surrounding properties, in particular at the southwest corner of the intersection. As shown in the illustration in Appendix 3, the conceptual configuration includes splitter islands with cutouts for pedestrians. A truck apron is recommended in the design to accommodate a WB-67 design vehicle (an interstate semi-trailer that is 73.5 feet long). As shown in the figure, a roundabout at this intersection could eliminate much of the on-street parking on the US 101 and 7th Street (North Fork Road) approaches.

NOTE: FIGURE 3 IS A CONCEPTUAL DESIGN ONLY. IT IS NOT A RECOMMENDED DESIGN. IF A ROUNDABOUT AT THIS LOCATION IS PURSUED, A DETAILED ALTERNATIVES DEVELOPMENT PROCESS IS RECOMMENDED.

Estimated Cost

An offset roundabout design in Nehalem would likely cost over \$1 million dollars. The Astoria Roundabout was constructed in the summer of 2002 at a cost of approximately \$1.5 million dollars. A roundabout in Nehalem would likely cost less than this project, as it would be smaller in scale and require less reconstruction work on the approaches. The cost would be dependent upon the details of the selected design, including right-of-way requirements, impacts to surrounding properties, and the degree of aesthetic and pedestrian and bicycle treatments.

Conclusions

Several needs have been identified for the intersection of US 101 and 7th Street (North Fork Road) through the Nehalem Downtown Transportation Plan:

- Improve the traffic control at the intersection, which is confusing for drivers,
- Accommodate turn movements by trucks or recreational vehicles through geometric improvements, and
- Address pedestrian crossing issues.

A conventional roundabout design at the intersection of US 101 and 7th Street (North Fork Road) would address each of these issues. In addition, a roundabout at this location would control speeds, likely improve safety, and accommodate high seasonal traffic on US 101 through the 20-year design horizon. A roundabout also would provide aesthetic improvements to downtown Nehalem.

However, based on ODOT and FHWA site criteria and a review of existing conditions, the following impacts and considerations would need to be further addressed for a roundabout to be a successful solution at this location:

- Driver education likely would be required to make drivers (commuter, local, and tourist traffic) aware of the roundabout and how to use it. Although there is an existing roundabout in Astoria along US 101, a roundabout would be a new concept for much of the traffic passing through Nehalem.
- A roundabout in this location would reduce the availability of on- and off-street parking in the intersection area. Opportunities to mitigate this impact through the provision of additional parking elsewhere in the area should be further explored to preserve and enhance the city's economic vitality.
- The City of Nehalem is concerned about accommodating truck and recreational vehicle turn movements. A truck apron could be included in the design to ensure large vehicles are able to maneuver through the roundabout.
- There would likely be right-of-way impacts to the surrounding properties (including impacts to existing buildings) if a roundabout were centered in the existing right-of-way. Therefore, construction of an offset intersection should be considered.

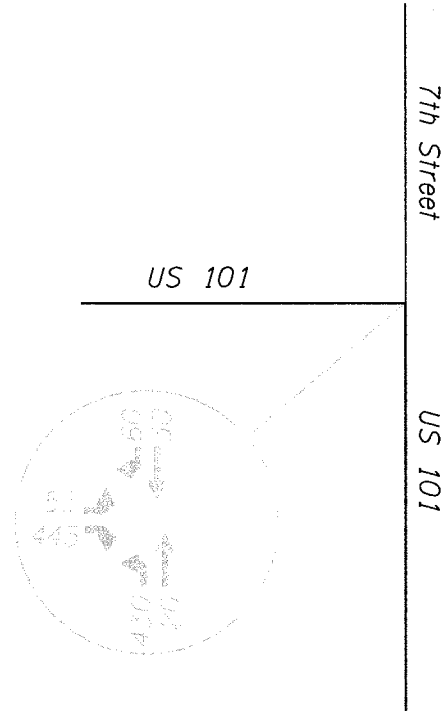
Roundabout Feasibility Study

- The existing driveway at the east leg of the intersection would be impacted by the roundabout. Options to reconfigure and/or relocate the driveway would need to be explored and would depend on the degree to which the roundabout is offset from the existing intersection location. Maintaining this access is important to the city, as it provides access to the Nehalem River.
- Appropriate pedestrian and bicycle treatments would need to be developed through the design process, as the roundabout would accommodate pedestrian traffic in downtown Nehalem and bicycle traffic as part of the Oregon Coast Bike Route.
- The intersection currently experiences drainage issues (flooding) that would need to be addressed through the design process.
- This intersection currently experiences high levels of tourist traffic. Operations at the Astoria roundabout during peak tourist periods should be further reviewed to determine if this issue requires special attention as part of the roundabout design.
- A number of aesthetic enhancements can be installed as part of a roundabout, including landscaping in the center island and colored and textured pavements on pedestrian and bicycle treatments. If a roundabout is pursued, these options should be explored, as they would provide aesthetic benefits to the city and to roundabout users.

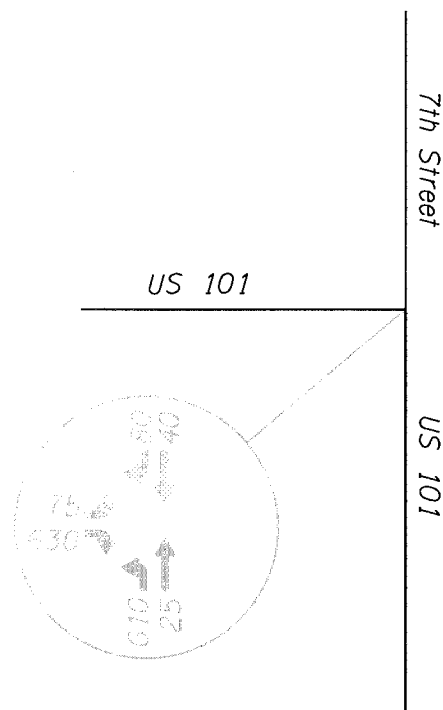
Due to the preliminary nature of this analysis, alternatives were not developed or analyzed. If ODOT and the City of Nehalem are interested in further study of a roundabout at this intersection, alternatives should be developed and analyzed to determine the most appropriate design. Alternatives should minimize impacts to surrounding properties, minimize impacts to on- and off-street parking, provide access to the Nehalem River at the east side of the intersection, provide adequate deflection for motorists, provide appropriate pedestrian and bicycle treatments, and explore aesthetic improvements.

Appendix 1: Traffic Volumes

Nehalem Downtown Plan
Existing 2002 and Forecasted
2022 30th Highest Hour Traffic Volumes



2002 30th Highest Hour Volumes

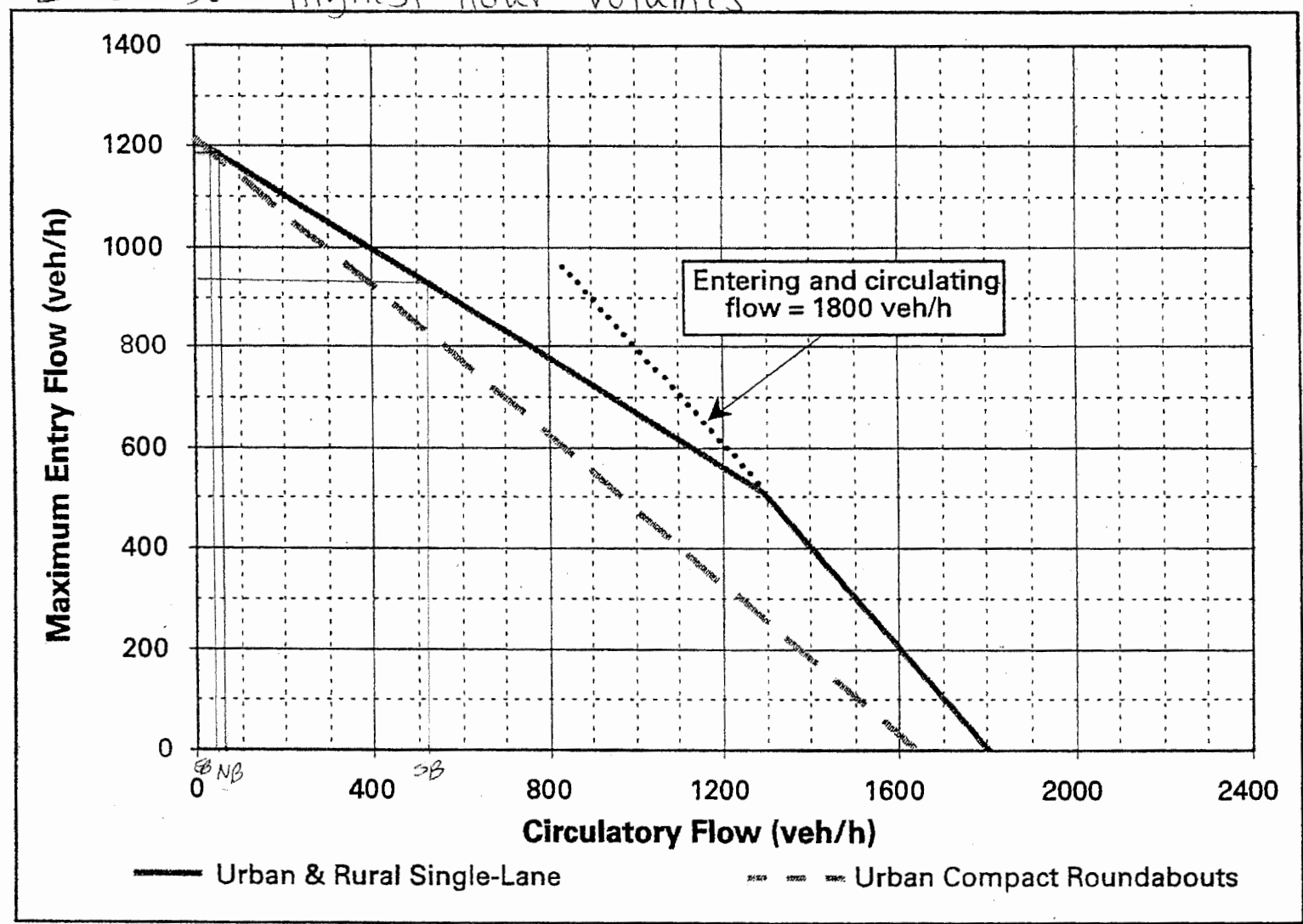


Forecasted 2022 30th Highest Hour Volumes

Appendix 2: Planning Level Operational Analysis

Movement	Circulating Vol. (vph)	Entering Vol. (vph)	Max. Entering Vol. (vph)	v/c Ratio
NB	70	550	1190	0.46
EB	45	635	1200	0.53
SB	525	135	930	0.15

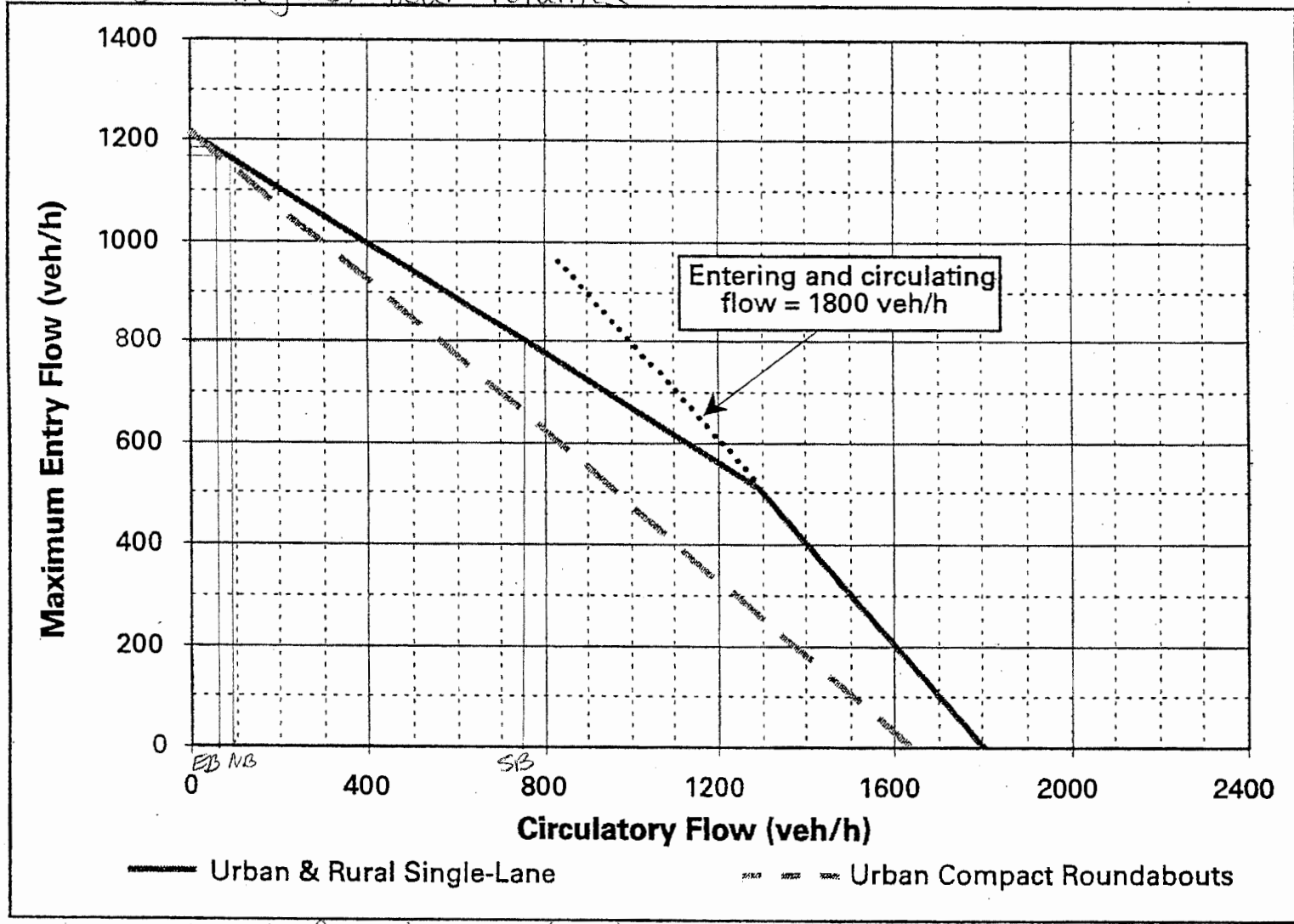
2002 30th Highest Hour Volumes



Source: FHWA Roundabout Guide, exhibit 4-3

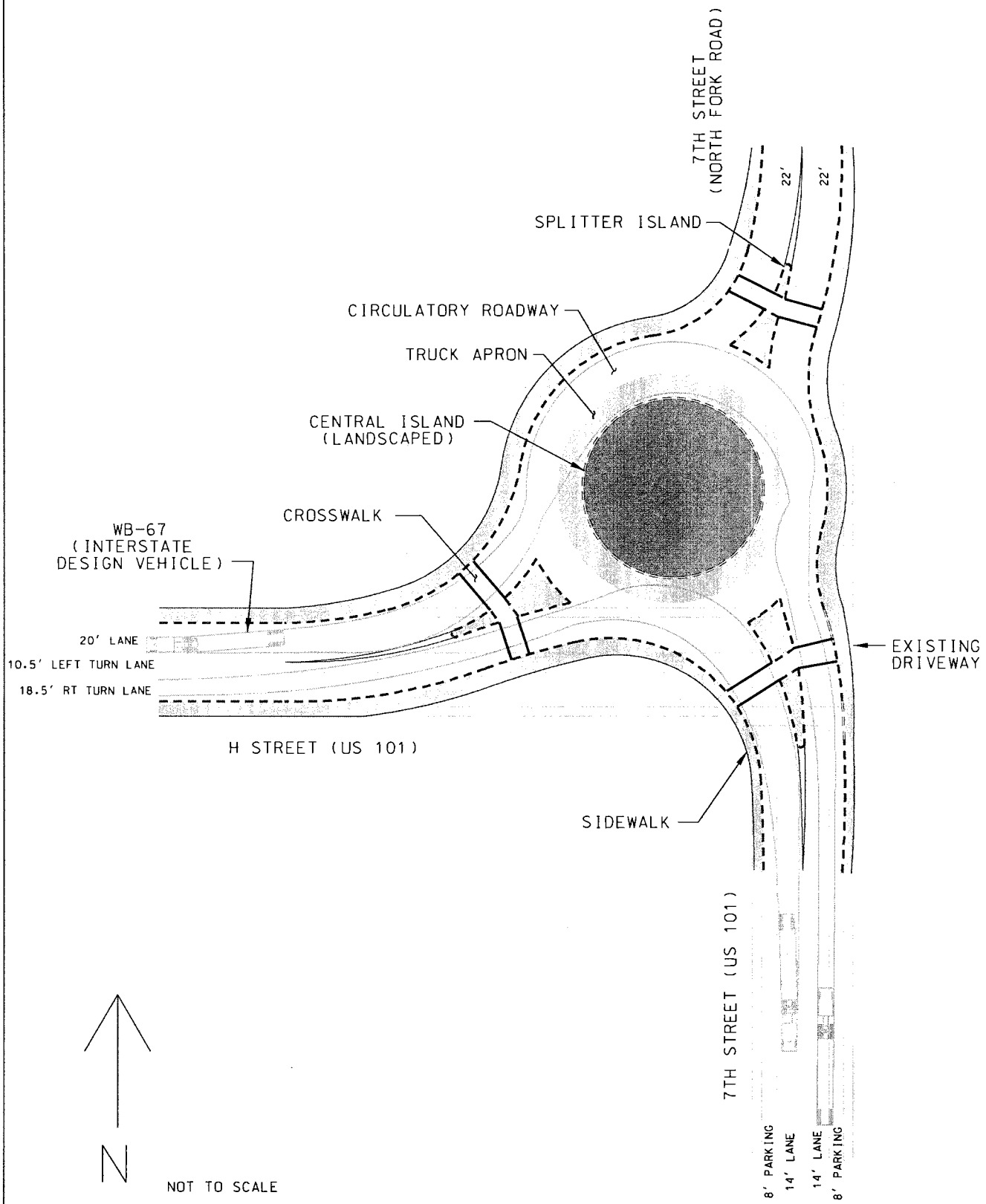
Movement	Circulating Vol (vph)	Entering Vol. (vph)	Max Entering Vol. (vph)	V/C Ratio
NB	95	775	1175	0.66
EB	60	895	1190	0.75
SB	745	180	800	0.23

2022 30th Highest Hour Volumes



Source: FHWA Roundabout Guide

Appendix 3: Conceptual Roundabout Drawing



POTENTIAL ROUNDABOUT CONFIGURATION
AT US 101 (7TH STREET/H STREET)

NEHALEM DOWNTOWN
TRANSPORTATION PLAN
JUNE 2003
CH2MHILL