



Tillamook

Transportation System Plan Update

Volume 2: Appendix

June 2019



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Appendix A

Public Involvement Plan



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Technical Memorandum #1: Public and Stakeholder Involvement Plan (v.2)

PREPARED FOR: City of Tillamook Staff
Ken Shonkwiler, ODOT

COPY TO: Kristin Hull, CH2M
Ryan Farncomb, CH2M

PREPARED BY: Kate Drennan, CH2M

DATE: March 16, 2017

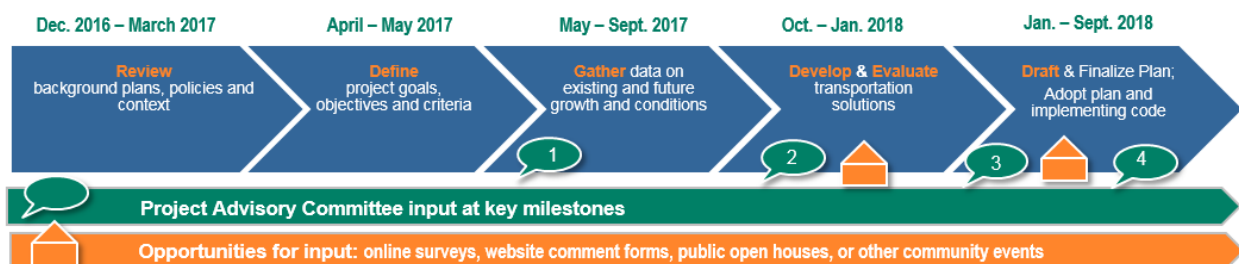
This memo describes the proposed public and stakeholder involvement plan to support the Tillamook Transportation System Plan (TSP) update. The TSP represents the City's vision for its transportation system. The TSP update will review existing projects and policies, and identify new projects and policies that will improve safety, mobility, and access for all users of the system. The plan will strive to support planned economic, commercial and residential growth. The project will ensure consistency between the Tillamook TSP and local and state policies, plans, and rules (including the Transportation Planning Rule).

This public involvement plan describes the public involvement goals and decision making process. It includes key messaging statements to assist the project team when discussing the project with the media or the public. Finally, it details outreach activities with assignments of responsibility and timelines for completion. This public involvement plan may be updated during the project to reflect changes in approaches or the project schedule.

Overview

The project schedule below outlines the timeline for technical work and public outreach processes for the project, which is expected to be completed by September 2018. The City, along with ODOT and the consultant team, will provide public involvement opportunities throughout the project, with a focus on key milestones.

Tillamook Transportation System Plan Update - Project Overview



Public and Stakeholder Involvement Goals

The City of Tillamook and Oregon Department of Transportation (ODOT) are committed to an approach that:

- Provides early and ongoing opportunities for stakeholders to raise issues and concerns that can be considered through equitable and constructive two-way communication between the project team and the public.
- Encourages the participation of all stakeholders regardless of race, ethnicity, age, disability, income, or primary language by offering alternative accommodations (e.g. translation services, transportation).
- Promotes fair treatment so that no group of people (racial, ethnic, or a socioeconomic group) bears a disproportionate share of the negative environmental consequences resulting from a program or policy.
- Ensures that public contributions are considered in the decision making process and can influence the development of the TSP.

This public involvement plan helps achieve these goals. The plan includes specific steps to provide opportunities for participation by federal Title VI communities. The City and CH2M will utilize the ODOT Title VI (1964 Civil Rights Act) Plan guidance to identify Title VI populations, formulate public involvement strategies, and report outreach efforts to and participation by Title VI communities.

Decision Making

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

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

The project decision structure includes the Tillamook City Council, Tillamook Planning Commission, Project Management Team and Project Advisory Committee. The project decision making structure is shown in Figure 1 and is described below.

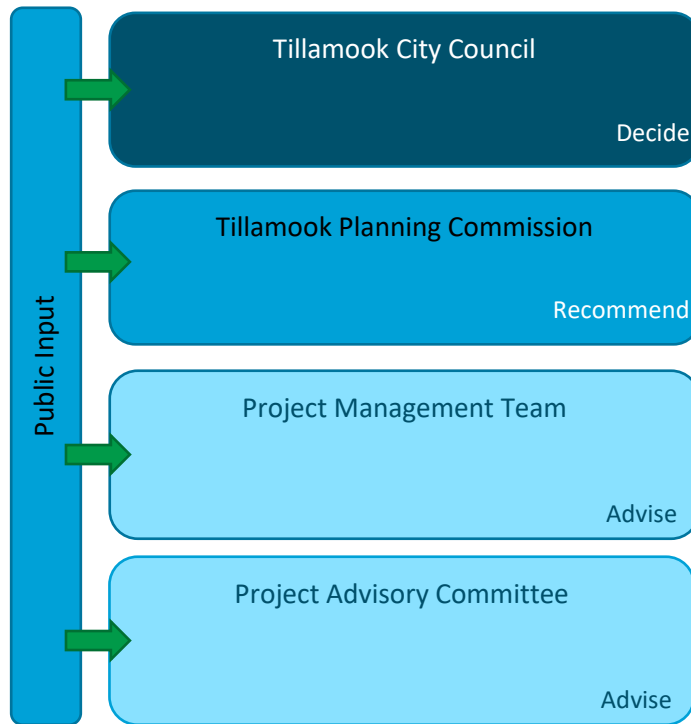


Figure 1. Decision-making structure

Decide: Tillamook City Council

The Tillamook City Council will adopt the final TSP.

Recommend: Tillamook Planning Commission

The Tillamook Planning Commission will make a recommendation to City Council on a final TSP and will provide direction to City staff throughout the development of the TSP.

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

The Project Management Team, comprised of staff from the City of Tillamook, ODOT, and the consultant team will make recommendations to the Planning Commission and City Council. The Project Management Team will consider Project Advisory Committee (PAC) input in developing their recommendation. The Project Management Team will also provide day-to-day guidance to the project manager and consultant team to ensure coordination with related planning efforts.

The PAC will synthesize public input, provide feedback and make recommendations to the Project Management Team on at key milestones throughout the project.

Target Audiences/Stakeholders

Stakeholders for this project include the City of Tillamook, transportation interests, neighborhood and business interests, media, emergency service providers, and the traveling public.

Target Audiences/Groups

Stakeholder Category	Examples
Government agencies and institutions	Tillamook City Council, Tillamook Planning Commission, Tillamook Public Works Committee, Tillamook Associations Committee, Tillamook County, ODOT, Confederated Tribes of Siletz Indians, Confederated Tribes of the Grand Ronde, Clatsop-Nehalem Confederated Tribes, Department of Land Conservation and Development (DLCD)
Utilities	Tillamook PUD, Charter Cable, Verizon
Schools and Youth	Tillamook School District #9 , Tillamook Bay Community College, Tillamook County YMCA
Transportation stakeholders	Greyhound bus, Port of Tillamook Bay, Amtrak (bus), Tillamook County Transit, Tillamook Airport, Oregon Coast Scenic Railroad
Advocacy groups	Tillamook Estuaries Partnership, Street Trust (formerly the Bicycle Transportation Alliance)
Employers and businesses	Tillamook Area Chamber of Commerce, Downtown Business representatives, Tillamook County Creamery Association, Tillamook County Farm Bureau, Freight (e.g. Averill Trucking, Hampton Lumber, Jenck Farms), Downtown Revitalization Association, Tillamook Regional Medical Center, City Sanitary
Emergency service providers	Tillamook Police, Fire and Rescue
Media	Headlight Herald, Tillamook County Pioneer, Coast River Business Journal, KTCB and KTMK Tillamook public radio stations
Low-income, minority, and limited English proficient (LEP) communities	Tillamook Head Start, Northwest Oregon Housing Authority, Northwest Senior & Disability Services, Tillamook County Women's Resource Center, Oregon Food Bank – Tillamook County Services, CARE

Environmental Justice Outreach and Title VI Compliance

The project team conducted a review of area demographics to inform the development of outreach strategies to reach low-income, minority, and limited-English proficient residents. The City will conduct targeted activities to reach these groups and will make accommodations (e.g. translation services) to encourage their participation. To engage these communities, the project team will employ the following strategies:

- Project Advisory Committee (PAC) meetings: include members from organizations that advocate for or serve low-income, minority or limited-English proficient residents.
- Community events: identify partner organizations that can co-host or promote community events to traditionally underserved communities. Collect demographic information (anonymously) at all public events to be added to the final report.
- Translation or special accommodations: translation services and other special accommodations will be provided at all meetings upon request.

Table 2 provides demographic information from the American Community Survey from 2011-2015 for the City of Tillamook and the state of Oregon to facilitate comparisons.

Population Demographics by Location

SUBJECT	TILLAMOOK CITY	OREGON
Total Population	4,958	3,939,233
Median Age	35	39
Population Under 18 Years	25%	22%
Population Over 65 Years	14%	15%
African American ¹	0.0%	2%
American Indian And Alaska Native	0.8%	1%
Asian American	0.6%	4%
Caucasian	87%	85%
Native Hawaiian And Other Pacific Islander	1%	0.4%
Two Or More Races	5%	4%
Hispanic Or Latino (Of Any Race)	11%	12%
Median Household Income	\$29,889	\$51,243
All People Living Below The Poverty Level In Last Year	32%	16.5%
People Over 16 Unemployed	9%	9%
Households With Food Stamp/Snap Benefits In Last Year	38%	19%
Speak A Language Other Than English At Home	10%	15%
Of Which, % That Are Fluent English Speakers	72%	60%
Of Which, % That Are Non-Fluent English Speakers	28%	40%

Notable differences between Tillamook and the state include:

- Tillamook has more young residents as a proportion of the population than the state average (average age is 35 and 25% of residents are under 18 years).
- Median household income is lower in Tillamook (\$29,889 median household income and 32% living below the poverty level) and more residents rely on Food Stamps/SNAP (38%) than the state as a whole. The unemployment rate is similar between the City and state, indicating more residents are considered “working poor.”

Project Description

The project team will use the following text in public materials throughout the outreach process to describe the project.

The City of Tillamook is creating a plan for the future of transportation in Tillamook. This transportation system plan (TSP) update will look at ways to improve connections for everyone traveling in or through the City whether by foot, bike, car, freight, boat, or air. The plan will also support land use and economic development goals set by the City. The TSP will be completed in September 2018. Find more information about the TSP update and ways to get involved at www.TillamookTSP.org

¹ Race alone not Hispanic or Latino

Public Involvement Tools and Methods

This section identifies key public involvement activities that CH2M or City staff members will conduct during the project. These actions will be developed in more detail as the TSP project progresses.

Stakeholder Interviews

CH2M will conduct five stakeholder interviews to inform the development of the public involvement plan, PAC membership and existing conditions report.

Stakeholder Mailing List

CH2M will develop and maintain a mailing list based on the stakeholder interviews and existing lists, and will add interested individuals identified through public events and the project website. The initial list will be provided to CH2M by the City. CH2M will maintain the mailing list, updating it before events, and will also collect and respond to all public comments received during the project.

Mailing List

Task	Responsibility	Schedule	Review
Initial mailing list	City	3/1/17	
Mailing list updates	CH2M	Quarterly	

Project Website

CH2M will develop the project website to provide basic, reader-friendly information. The website will allow the public to view upcoming meetings and provide comments, either online or by contacting city staff by phone, email, or mailed letters. Pages on the website will include a project overview, project schedule, ways to get involved, and a resource page with project memos.

Website

Task	Responsibility	Schedule	Review
Website text and graphics, draft	CH2M	1/26	City
Finalize and post website text and graphics	CH2M	3/15	
Website update and meeting materials posted	CH2M	Three days before meetings	

Project Advisory Committee (PAC)

CH2M will coordinate with the City and ODOT to develop a list of PAC members. The PAC will meet a total of four times to review project deliverables and provide guidance on the specific tasks.

Each meeting will be open to the public and advertised on the project website. The following topics are currently planned for each meeting:

- **Meeting # 1:** Review the TSP process and provide an introduction to transportation planning
- **Meeting # 2:** Review and comment on the existing and future conditions, deficiencies, and needs memos before the information is presented to the general public at the first Community Event

- **Meeting # 3:** Review and comment on potential solutions and strategies, funding forecasts, and transportation standards that will determine the policies and strategies in the TSP
- **Meeting # 4:** Review and comment on the Draft TSP and community outreach results

Tasks for PAC Meetings

Task	Responsibility	Schedule	Review
PAC membership	City	One month before first meeting	ODOT/ City
PAC agenda and other materials	CH2M	One week before meeting	City/CH2M
Distribute materials to PAC and post to website	CH2M	Three days before meeting	City
Develop meeting summary	CH2M	One week after meeting	City
Finalize meeting summary and post to website	CH2M	Two weeks after meeting	City/CH2M

Targeted Outreach to Environmental Justice/Title VI Communities

CH2M will prepare and develop a fact sheet about the TSP process translated into Spanish. CH2M will also conduct three focused events throughout the project to share information with Title VI/EJ communities. These events might include tabling at the Tillamook Transit Center, riding the bus to conduct intercept surveys, or meeting with social service providers. Beyond the fact sheet, these events will use materials developed for other events. CH2M will provide a summary of events. The project scope and budget assumes that these events are conducted over two days.

Targeted outreach to notify EJ communities about public events will include a postcard ad, poster, or press release with a Spanish language message providing instruction on how to request a translator. The City will ask local business owners in the area who may serve non-English speaking customers to attend the Community Event and display the poster. The business owners should be told that translation services will be available and to please share the information with their customers, friends, and neighbors. The meeting will be held in an accessible facility.

Targeted Outreach Tasks

Task	Responsibility	Schedule	Review
Draft fact sheet language	CH2M	Two month before first tabling event	City
Finalize fast sheet	CH2M	One month before first tabling event	
Schedule tabling events	CH2M	TBD	City

Community Events

The first Community Event will be held in November 2017. The goal of the meeting will be to solicit public input on the existing and future transportation conditions, deficiencies, and needs, as well as introduce the project to the community. The format of the meeting will allow participants to offer input on the goals and objectives of the plan and make suggestions for transportation system alternatives to be considered by the PMT when developing alternatives to meet the transportation system deficiencies. This could be through a standard open house or some other event format. Typically events allow participants to drop in, read display boards with information, provide input on comment forms and on maps, and to speak with project staff members.

For the first Community Event, CH2M will create an online mapping tool that allows users to place comments on a map identifying transportation issues or opportunities. An online survey may accompany the map. This tool will allow the project team to collect feedback from those who may not attend the event itself, and will be open for input for up to two weeks after the first Community Event.

The second Community Event will be held in June 2018. The goal of the second meeting will be to solicit feedback on the Draft TSP and proposed improvements to the local street system, pedestrian and bicycle system, and transit system in Tillamook. The format of the meeting will be determined later in the project process, but could be a standard open house or other event format.

For both community events, CH2M and the City will share responsibility in hosting the event. The City will schedule the date and reserve a space for each event. The City will also provide a press release notification to the media and distribute public information on the City website. CH2M will prepare and mail a postcard to the interested parties list and addresses within the City limits. CH2M will create all written materials and event display boards, as well as an online participation opportunities. CH2M will be responsible for providing light refreshments for participants.

CH2M will prepare a summary, which will include all verbal and written comments collected through the flip charts, comment forms, or maps after each community event.

Community Events Tasks and Responsibility

Task	Responsibility	Schedule	Review
Reserve meeting or event space	City	6 weeks before event	
Prepare event announcement	CH2M / City	6 weeks before event	City
Prepare meeting or event plan	CH2M	4 weeks before event	City
Distribute event announcement and notify mailing lists	CH2M / City	4 before event	
Create online map and survey feedback tool	CH2M	3 weeks before event	City
Prepare display boards and meeting materials	CH2M	3 weeks before event	City
Hold meeting	CH2M with City	On date	
Prepare meeting summary (including feedback received online)	CH2M	3 weeks after event	City

Appendix B

Background Plans and Policies Review



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Tillamook TSP

Final Background Plans and Policies Review



REVISED June 12, 2017

Prepared for: Paul Wyntergreen, City of Tillamook

Copy to: Ken Shonkwiler, ODOT
Kristin Hull, CH2M

Prepared by: Eddie Montejo, CH2M
Kate Drennan, CH2M
Ryan Farncomb, CH2M

Introduction

This memorandum provides policy and plan context for the City of Tillamook's Transportation System Plan (TSP) update. The purpose of this memorandum is to describe issues of unique concern to the City of Tillamook, to build upon prior planning efforts, and to help all stakeholders develop a common understanding of the policy and planning context within which the TSP will be updated. This memorandum identifies key improvement projects, goals, policies, and performance measures that should be considered in the TSP update. Technical Memorandum #3, Regulatory Review, provides additional regulatory context for the TSP update and further recommendations for the TSP update.

The memorandum includes an overview of each plan or policy document followed by a recommendation from the project team about how the plan or policy may be relevant to the TSP update. The project team reviewed the following documents for applicable plans, projects, goals, and policies relevant to the TSP.

Local Plans, Policies, and Other Documents

- City of Tillamook Comprehensive Plan (2012) and corresponding amendments
- City of Tillamook Transportation System Plan (2003)
- City of Tillamook Transportation Refinement Plan (2006)
- City of Tillamook Sidewalk Improvement Plan (2011)
- City of Tillamook Hoquarton Waterfront Plan (2016)
- City of Tillamook Public Works Design Standards (2014)
- City of Tillamook Parks and Recreation Master Plan (2013)
- Tillamook Town Center Plan (1999)
- Tillamook Stormwater Management Plan (2016)
- Tillamook Flood Mitigation Plan (2010)
- Tillamook Chamber of Commerce Temporary Parking TM #1 (2016) and Wayfinding Memo
- City of Tillamook Parking Management Plan (2014)
- City of Tillamook Downtown Parking District

- City of Tillamook Right-of-Way Use Permit Requirements (2016)
- Hoquarton Waterfront Overlay District Adoption (2016)
- Adoption of the Salmonberry Trail (2016)
- Wayfinding Plan (2017)
- Tillamook/ODOT US 101 and OR 6 Cooperative Improvement Agreement (2017)

County Plans and Policies

- Tillamook County Road Construction Plan Standards
- Tillamook County Transportation System Plan (2005)
- Tillamook County Multi-Jurisdictional Natural Hazards Mitigation Plan (2017)

State Plans, Policies, and Statutes

- Oregon Statewide Transportation Improvement Program (STIP)
- Oregon Freight Plan (2011)
- Oregon Transportation Plan (2006)
- Oregon State Rail Plan (2014)
- Oregon Highway Plan (and subsequent amendments) (1999 - 2011)
- Oregon Public Transportation Plan (1997)
- Oregon Bicycle and Pedestrian Plan (2016) and Design Guide (2011)
- Oregon TSP Guidelines (2008)
- Oregon Access Management Rules (OAR 734.051)
- Oregon Resilience Plan (2013)

Other Plans and Guides

- US 101/OR 6 Design (2015)
- US 101/OR 6 Alternatives Analysis Report (2012)
- National Association of City Transportation Officials (NACTO) Urban Design Guide

Local Plans, Policies, and Other Documents

City of Tillamook Comprehensive Plan (2012) and amendments

Overview

The City's Comprehensive Plan provides a planning framework to guide future growth and development decisions within the City of Tillamook. The Comprehensive Plan was adopted by City Council in 2012. The City of Tillamook Transportation System Plan (TSP) is the transportation element of the Comprehensive Plan. The Comprehensive Plan contains findings, policies, and goals related to several community needs such as land use, community development, and public facilities.

The City recently (2016) updated the Economy chapter of the Comprehensive Plan, which was updated to reflect an Economic Opportunity Analysis completed in the City. The revised chapter acknowledges four "receiving" sites for new commercial development, including:

- OR 6/Wilson River Loop Site
- OR 6 / US 101 / Pacific Avenue Extension site
- Downtown Tillamook

- Port of Tillamook Bay

Recommendation

In addition to the transportation-focused element, the Comprehensive Plan includes several goals, objectives, and implementing policies that are relevant to the TSP update. The TSP update will be consistent with these goals, objectives and policies, in addition to recommending updates.

Goals/Objectives:

- **Goal 5 Wetlands:** An inventory of Goal 5 wetlands identified four sites within the City of Tillamook. The City will protect these wetlands and transportation planning efforts will need to account for the existence of these protected wetlands.
- **Objectives for Recreation:** Create a strong connection of trail segments throughout the City.

Policies:

- **Policy B-7, Consistency with the 2020 Vision Statement:** This policy considers the Vision Statement as the starting point for the creation and implementation of long-range action plans.
- **Policy D-22:** The improvement of substandard streets through Local Improvement Districts (LIDs) are required to accommodate storm drainage.
- **Policy D-42:** Coordinate with School District #9 to consider an amendment to the City TSP for the additional Junior High right-of-way.
- **Policy D-55:** Use of the Oregon Coast bicycling trail as shown on the Transportation System Plan Pedestrian Bicycle Map is encouraged.
- **Policy D-56:** The southward extension of the Oregon Coast hiking trail is encouraged by the City, along with the Rails and Trails program.
- **Policy E-31:** The City shall explore the feasibility of providing covered walkways and sidewalk amenities in the core area.
- **Policy E-39:** Tillamook City shall provide "City Gateways" at the five (5) major street entrances to the City of Tillamook: Trask River Bridge, Wilson River Bridge, Port of Tillamook Bay RR Bridge on Highway 6, South Highway 101 Divider Island at Main & Pacific, and the Hoquarton Crossing on 101.
- **Policy E-40:** The City shall encourage the development of a tourist wayside-rest area along Highway 101 North and Highway 6, and shall coordinate with Tillamook City service clubs to acquire and develop such facilities.

Implementing Procedures:

- **Implementing Procedures for Policy E-44:** (1) Foster a climate, which promotes a physically safe environment that is pedestrian-friendly; (2) The City government and utility providers shall actively support and participate in the creation of a viable business mix and a pedestrian-friendly and livable City Center.
- **School District Master Plan, site acquisitions:** (1) Establish road right-of-way on the west side of East School from Alder Lane to Twelfth Street; (2) Build a roadway along the west property line of the East School property between Alder and 12th Street (Marolf Loop). A right-of-way would have to be obtained for the southern 300 feet of this right-of-way.

The “receiving” sites identified in the revised Economy chapter of the Comprehensive Plan will be considered when developing TSP improvement projects; these sites were determined to have the most new/redevelopment potential, and therefore could be one focus for improvements as part of the TSP update.

City of Tillamook Transportation System Plan (2003)

Overview

The TSP is the transportation element of the City’s Comprehensive Plan and was formally adopted by the City in 2003. The TSP documents goals and objectives related to the City’s transportation system, including its network of highways, streets, bicycle facilities, and sidewalks using a planning horizon year of 2022. The TSP also considers improvements to rail, freight, air, and water elements within the City of Tillamook.

Major facilities include US 101, OR 6, and OR 131. Highway 101 (US 101) is known as the Oregon Coastal Highway. This north-south route runs through the City of Tillamook’s downtown, where it splits into the Main and Pacific Avenues couplet. A portion of Highway 101 (Main and Pacific Avenues) between 1st Street and 9th Street is a special transportation area (STA) in accordance with the Oregon Highway Plan (OHP, 1999). STAs are districts along state highways (within an urban growth boundary) in which the need for appropriate local access outweighs the considerations of highway mobility.¹ STAs may include special features that result in lower speeds, narrower lane widths and wider sidewalks.²

- **Policy D-26 through D-41** of the Comprehensive Plan relate to the transportation system. The policies recommend actions to implement the goals and objectives documented in the 2003 TSP. The policies recommend improvements and financing strategies for existing and future transportation system needs including roadway, public transportation, bicycle, pedestrian, and rail facilities. **Policy D-26:** Tillamook shall take full advantage of its present investment in street improvements and also take actions to ensure future developments are in the best interest of the local residents, which includes facilitating the flow of goods and services for the local economy.
- **Policy D-27:** The City should pursue funds from the State for implementing transportation programs. Emphasis shall be placed on programs which minimize adverse social, economic and environmental impacts and costs, and enhancement of funded projects such as future phases of the Third Street conversion and augmentation of the Highway 101/OR 6 project.
- **Policy D-28:** Carpooling for work trips is encouraged.
- **Policy D-29:** All new commercial developments and all new residential developments larger than a duplex shall be located on fully improved streets.
- **Policy D-30:** The streets in new subdivisions will be designed to improve traffic circulation in nearby existing subdivisions.
- **Policy D-31:** Street grids shall be the preferred street pattern over isolated cul-de-sacs and the broader roads that connect them.
- **Policy D-32:** New subdivisions shall provide sidewalks and are encouraged to provide bike paths.

¹ Oregon Department of Transportation (1999). Oregon Highway Plan, Including amendments November 1999 through May 2015. An Element of the Oregon Transportation Plan. “Special Transportation Areas (STAs)”, p. 44.

² City of Tillamook, Oregon (2012). Comprehensive Plan. Chapter 7: Section D: Public Infrastructure, Public Facilities and Services. “Highways”, p. 7-7

- **Policy D-33:** Pedestrian/bikeway connections are encouraged along Holden Creek and Twelfth Street; along the Trask River on the west; adjacent to Third Street from the Southern Pacific Railroad tracks from Trask River Road, and; linking all park and recreation areas in the City to one another as a Pedestrian Loop System.
- **Policy D-34:** Walking is encouraged by sidewalks with street trees, narrow roads that slow down traffic and most importantly, commercial and recreational areas which are located a short walk from most residential areas. The City will encourage walking as a means of transportation by addressing the following:
 - *Connectivity.* The City will work to develop a connected network of pedestrian facilities. Connected networks are important to provide continuity between communities and to improve safety.
 - *Safety.* The City will work to provide a secure walking environment. For residents to use the pedestrian system, it must be perceived as safe.
 - *Design.* The City can ensure pedestrian-oriented design by adopting policies and development standards that integrate pedestrian scale, facilities, access and circulation into the design of residential, commercial and industrial projects.
- **Policy D-35:** Various state programs available for development of pedestrian and bike path systems will be pursued by the City. The Oregon Coast Bike Trail travels through Tillamook. The City shall coordinate with the Department of Transportation on the particular needs of bikers using that trail.
- **Policy D-36:** The City recognizes the importance of transportation systems in the City and encourages the continuation and, where appropriate, the expansion of the following networks in addition to streets and pedestrian/bikeway systems.
 - *Railroads:* Port of Tillamook Bay
 - *Barge:* At Garibaldi, 9 miles north
 - *Motor Carriers:* One common carrier
 - *Air:* Tillamook Municipal Airport
 - *Intercity bus:* Tillamook County Transportation District (TCTD)
 - *Local bus:* TCTD, Senior Citizens' Group
 - *Taxi:* Tillamook Taxi (private company)
- **Policy D-37:** Development and maintenance of public transportation is encouraged. Bus systems such as TCTD should be maintained for all age groups. The City shall support the provision of enhanced bus facilities that are in TCTD plan and pay particular attention to the transportation-disadvantaged when developing alternatives to meet growing transportation needs.
- **Policy D-38:** The City TSP shall be included in the City's Comprehensive Plan as Appendix XXI. The City Transportation Refinement Plan shall be included in the City Comprehensive Plan as Appendix XXII.
- **Policy D-39:** The City of Tillamook shall protect the function of existing and planned roadways, railways, waterways and airways as identified in the TSP, and as a result the Rails and Trails feasibility study.
- **Policy D-40:** The City of Tillamook shall include a consideration of land use impacts on existing or planned transportation facilities in all land use decisions.
- **Policy D-41:** The City shall identify and support the transportation goals, objectives and implementing strategies listed in the City TSP.

Recommendation

The project team will review policies and projects from the 2003 TSP to:

- Remove projects that have been completed;
- Assess projects not completed for potential inclusion in the TSP update;
- Revise, retain, or eliminate policies.

The TSP update will revise or retain other 2003 TSP elements such as the functional classification plan.

City of Tillamook Transportation Refinement Plan (2006)

Overview

The City of Tillamook Transportation Refinement Plan (TTRP) was undertaken by City, Tillamook County, and ODOT Region 2 to develop solutions to minimize the impact of local- and through-freight truck traffic and large recreational vehicles in the City of Tillamook downtown commercial area and across the Hoquarton Slough. The TTRP also evaluated pedestrian safety and parking challenges in downtown Tillamook. Among other findings, the TTRP concurred that vehicle traffic at the intersection of US 101 and OR 6 would exceed ODOT mobility standards within the 20-year planning horizon (2025). The TTRP identified and compared improvements to the US 101/OR 6 intersection including restriping, sidewalk reconstruction, and signal upgrades but did not identify a preferred build alternative. The TTRP proposed the following improvements to enhance mobility:

- Improve truck routes outside of downtown, in particular minor improvements to county roads to support existing levels of truck traffic on those facilities;
- Revise Tillamook Lumber Mill circulation, in particular how trucks enter and exit the mill and the related effect on truck traffic in downtown Tillamook;
- Manage downtown parking, in particular the management and use of existing spaces and identifying options for creating additional spaces.

Recommendation

The TSP update will recommend projects to minimize the impact of local and through freight truck traffic in accordance with the City of Tillamook Transportation Refinement Plan. The TSP update will also pursue parking management strategies downtown in accordance with this and other reviewed plans.

City of Tillamook Sidewalk Improvement Plan (2011)

Overview

The Sidewalk Improvement Plan (SIP) provides an analysis framework for identifying and removing sidewalk hazards, protecting property owners from the expense of liability claims due to personal injury, and for developing ADA-compliant corridors that improve mobility for all users. It creates a phased plan approach for bringing sidewalks within the City of Tillamook into ADA-compliance with instructions for implementation.

Recommendations

The TSP will review project phases that were not completed as part of SIP implementation and will consider projects and policies to include when updating the TSP.

City of Tillamook Hoquarton Waterfront Plan (2016)

Overview

The Hoquarton Waterfront is located off the intersection of US 101 and OR 6 and provides important connections to community destinations within the City of Tillamook. The Waterfront Plan proposes redevelopment projects and programs within four key focus areas along the Hoquarton Slough. A major objective of the Waterfront Plan is to create a balanced transportation network by providing safe travel routes for pedestrians, bicycles, automobiles, and trucks accessing and traveling within the Hoquarton Waterfront area. The Waterfront Plan identifies several multi-modal transportation improvements, organized by improvement areas, to be considered independently or as part of the TSP update. The Waterfront Plan also directly recommends some transportation projects for adoption during the TSP update. The following sections briefly describe transportation projects identified in the Waterfront Plan, including those that are specifically recommended for TSP adoption.

PROJECTS TO BE CONSIDERED

Gateway Projects

- **Gateway Features (G1):** The Hoquarton crossing on US 101 is a major entrance to the City's core. The project calls for a distinctive gateway element on the north side of OR 6, approaching the US 101 intersection.
- **US 101/OR 6 Traffic Improvement Project (G2):** This project is presently under construction.
- **Crosstown Connections Project (G3):** The project will install a walking and bicycle path along an old railroad spur from the east through Hoquarton Park and west across US 101 to Front Street. The purpose is to enhance multi-modal circulation within the City of Tillamook. The Crosstown Connections Project will be under construction simultaneously with the US 101/OR 6 Traffic Improvement Project.
- **South and North Bank Promenade and Trail Connections to the Future Heritage Recreation Area (G6):** The project creates a connection between the southern bank of the Waterfront (created by the US 101/OR 6 project) and Goodspeed Park to the east via an old Port of Tillamook Bay (POTB) rail spur. The link between Goodspeed Park and Hoquarton Park on POTB right-of-way (ROW) will be implemented by the Crosstown Connections Project. A footbridge planned to connect the Hoquarton Forest and a promenade along the south and north bank will provide further trail connections to the Heritage Recreation Area.
- **Salmonberry Trail:** The Salmonberry Trail is a planned regional multi-use trail between Banks in Washington County and the Tillamook Airport south of Tillamook. The Salmonberry Trail will generally follow the 86-mile-long Port of Tillamook Bay Railroad right-of-way east of US 101 and/or by sharing portions of US 101. The coastal segment of the trail begins south of Tillamook and ends north of the City of Wheeler. The trail continues east past Nehalem River Bay and through Salmonberry River Canyon before reaching the City of Banks, approximately 58 miles east of the confluence of the Salmonberry and Nehalem Rivers. As of 2016, the Port of Tillamook Bay is partnering with State agencies, local jurisdictions, and interest groups to plan and build the Salmonberry Trail in sections of the rail right-of-way. City Council adopted the Salmonberry Trail into the Comprehensive Plan by ordinance in 2016.

Waterfront Core Projects and Programs

- **Boardwalk (WC2):** This project proposes an interpretive boardwalk linking trails and overlooks extending west from Sue H. Elmore Park along the southern bank of Hoquarton Slough. The

boardwalk would expand on the existing interpretive walk east of US 101 to create an integrated corridor of public access along Hoquarton Slough.

- **Ivy Avenue (WC3):** Ivy Avenue will become the primary pedestrian connection from downtown Tillamook to Sue H. Elmore Park. The project includes streetscape improvements such as lighting and landscaping, as well as wider sidewalks and curb extensions. A pedestrian crossing is proposed before the Farm Store to lead pedestrians across Ivy Avenue and preserve angled parking.
- **Transportation-related Projects (WC5):** WC5 refers to several transportation projects within the Waterfront Core. These projects will seek to draw trucks, transit, vehicles, and bicycles off US 101 at Front Street to north-south connections further west, as well as keeping Ivy Avenue pedestrian-oriented (as described in WC3). Other improvements include new transit stops, wayfinding signage, and bike lanes identified in the Crosstown Connections project and 2003 Tillamook TSP.

Heritage Employment Area

- **Boardwalk (HE3):** A boardwalk that connects a series of overlooks at the north ends of Elm, Grove, and Stillwell Avenues could extend over the Hoquarton Slough.

TRANSPORTATION PROJECTS AND PROGRAMS RECOMMENDED FOR TSP ADOPTION

- **Hoquarton Waterfront Circulation Plan (T1-T13):** The circulation plan within and immediately adjacent to the Hoquarton Plan area promotes multimodal circulation, enhances access to the Hoquarton Slough, supports local and regional travel, and supplements the Oregon Scenic Byway that traverses the City.
- **Proposed Primary Multi-Modal Circulation Routes:** Primary circulation routes for vehicle and freight traffic are proposed to be preserved while maintaining attractive and safe routes for pedestrians and bicyclists.
 - *Designated vehicular routes*
 - Front Street, Stillwell Avenue, First Street, Birch Avenue, and Third Street
 - *Primary freight routes*
 - Stillwell Avenue, and Fir Avenue between Front Street and Third Street
 - *Primary bicycle routes*
 - Front Street between Stillwell Avenue and Main Avenue, First Street between Stillwell Avenue and Birch Avenue, and Third Street west of Stillwell Avenue
 - *Pedestrian circulation*
 - Encouraged throughout the Hoquarton Waterfront via sidewalk widening, curb extensions, and sidewalk amenities
- **Parking Management and Pedestrian Streetscape Improvements:** Parking management strategies should be considered to accommodate potential increased activity in the Hoquarton Area. Streetscape improvements should prioritize pedestrian comfort in the zone between buildings and the curb.
- **Planned Cross-sections for Front Street, First Street, and Second Street:** Cross-sections that enhance multi-modal access along Front, First, and Second Streets are proposed in the Waterfront Plan. Multi-modal treatments include conventional bike lane markings, 'sharrow' pavement markings, pavement widening to accommodate road users, and designated on-street parking.
- **Downtown Branding and Signage (S1):** A signage system that is integrated with Hoquarton visual gateway elements is proposed to help support downtown revitalization efforts and to ensure safe, convenient wayfinding for autos, trucks, bicycles, and pedestrians.

Recommendation

The TSP update will consider all multi-modal transportation projects within the Hoquarton area proposed for addition to the TSP, including the South and North Bank Promenade and Trail Connections project and the adopted Salmonberry Trail project. Projects and implementation actions in the TSP will be consistent with ongoing transportation improvement plans supported by the Hoquarton Waterfront Plan, such as the Crosstown Connections Project.

City of Tillamook Public Works Design Standards (2014)

Overview

The City of Tillamook Public Works Design Standards (“Standards”) set requirements for street design, grading plans, erosion control, landscaping, drainage calculations, and other infrastructure. The Standards, along with the 2008 Oregon Standard Specifications for Construction and ORS 209.140-155 define technical specifications for roadways. The Standards are intended to be consistent with the *Tillamook Engineering Specifications and Design Criteria Manual*. Tillamook’s functional classification system for existing and proposed roads is established by the TSP. Standard cross-sections for Tillamook’s transportation system are provided, as well as design guidelines for accesses, half-street improvements, road restoration, conveyance encroachments, and other road construction activities.

Recommendation

The TSP update will ensure recommended plans and project conform to the City of Tillamook Public Works Design Standards, unless design exceptions are sought. The design standards may also be revised as part of the TSP update.

City of Tillamook Right-of-Way Use Permit Requirements (2016)

Overview

The City of Tillamook requires Right-of-Way (ROW) users to comply with ROW permit regulations. ROW permit regulations set requirements for site plans, sidewalk obstruction, signage, security, impacts to businesses, and parking. As of Spring 2017, the City of Tillamook is also considering the adoption of City Ordinance No. 1326, regarding the use and occupation of the public ROW and establishing an application process, fees and terms for such use.

Recommendation

The TSP will consider existing ROW Use Permit Requirements, as well as proposed Ordinance No. 1326 regarding the use and occupation of the public ROW.

City of Tillamook Parks and Recreation Master Plan (2013)

Overview

The City of Tillamook Parks and Recreation Master Plan (“Parks and Rec Plan”) identifies a framework for providing and managing park, open space, and recreational facilities in the City of Tillamook. The plan states a strong need for creating a system of pedestrian trails linking park and recreation areas throughout the City; to develop and maintain an interconnected core of these trail systems, and to provide a variety of recreational opportunities for bicycling and walking.

The Parks and Rec Plan highlights the importance of a pedestrian system that connects residential areas with commercial centers, schools, community destinations, and transit facilities, which are collectively referred to as pedestrian generators. The City currently maintains approximately 2,270 linear feet of pedestrian paths throughout City parks. Sidewalk and pedestrian connections are generally

concentrated in the downtown commercial core (along Main and Pacific Avenues and the immediate side streets) and the newer residential areas near the eastern city limits.

Specific transportation projects proposed as part of the Parks and Rec plan include the development of a bike and skate park, bicycle amenity improvements at Dean Memorial Wayside Park, trail safety improvements in Foundry Park, and several other trail, pathway, and connector development projects throughout the City of Tillamook.

Recommendation

The TSP update will consider the transportation-related needs included in the Parks and Rec Plan and will include implementation actions that provide or enhance multi-modal connections to park and recreation facilities for a variety of users. The TSP update will also seek to preserve open spaces throughout the City.

Tillamook Town Center Plan (1999)

Overview

The Tillamook Town Center Plan defines a town center boundary and illustrates opportunities for new public open space, civic buildings, and architectural restoration of key buildings. The plan study area includes Main and Pacific Avenues (one-way couplets for Highway 101 within the City), 2nd, 3rd, and 4th Streets, and a portion of OR 6. In addition to several architectural and streetscape improvements throughout the plan study area, a 5-acre greenway park and trail are proposed on a vacant parcel of land along Hoquarton Slough and the abandoned railroad right-of-way. The plan recommends new public parking and a pedestrian/bike link between the park and town square.

Recommendation

The TSP update will consider transportation opportunities and community design preferences documented in the Tillamook Town Center Plan. The TSP may include a review of pedestrian and bicycle links proposed as part of the park and trail development along Hoquarton Slough.

Tillamook Stormwater Management Plan (2016)

Overview

The 2016 Stormwater Management Plan is intended to mitigate the stormwater impacts created by street and bridge widening, and street realignment for the US101 / OR6 Project (the Project). The Project will widen travel lanes on Main and Pacific Avenues, and replace the three-lane bridge across the Hoquarton Slough with a four-lane bridge. The Project will also create a new street, private development parcels, and a new parking lot. To mitigate the impacts from added impervious surface area near the slough, facilities and improvements will be installed for stormwater treatment and conveyance. The Project adds 6.3 acres of new or reconstructed impervious surface, but results in a net decrease of contributing impervious surface due to conversion of existing impervious areas.

Recommendation

The TSP update will consider best practices in stormwater management, including the transformation of existing impervious surfaces in a project right of way to a vegetated, pervious surface during project construction or reconstruction.

Tillamook Flood Mitigation Plan (2010)

Overview

The Tillamook Flood Mitigation Plan is a multi-agency roadmap for mitigating and responding to flood events in Tillamook County. Following the flood and landslide disasters in 1996, Tillamook County drafted a series of plans focused on flood hazard mitigation. The 2010 Plan identifies potential hazards across seven Cities within Tillamook County. All seven city councils adopted the plan which directed departments to identify available funding to implement plan actions. Flooding risk is most acute along US 101/ North Main from the Wilson and Trask Rivers. The Dougherty, Hall, and Hoquarton sloughs also pose a flooding threat, though to a lesser extent than the rivers.

As of the writing of this plan, the Tillamook Flood Mitigation Plan is currently being augmented by a Natural Hazard Mitigation Plan update lead by the Oregon Department of Land Conservation and Development (DLCD).

Recommendation

The TSP update will consider the goals and policies of the Tillamook Flood Mitigation Plan such using active and passive stormwater treatments in public right of way.

Tillamook Chamber of Commerce Temporary Parking TM #1 (2016) and Wayfinding Memo

Overview

Beginning in 2016 the Oregon Department of Transportation (ODOT) is carrying out a two-year reconstruction of US 101/OR 6 in downtown Tillamook. Downtown business owners have expressed concerns about potential adverse economic impacts resulting from reconstruction activities. The Tillamook Chamber of Commerce Temporary Parking and Wayfinding Memorandum introduces a suite of immediate, short- and medium-term actions to address potential parking impacts in downtown Tillamook.

Recommendation

The TSP update will consider the on-going impact of the project on downtown parking availability and consider whether temporary strategies should be continued at the conclusion of the reconstruction activities to minimize long-term parking impacts.

City of Tillamook Parking Management Plan (2014)

Overview

The Parking Management Plan was prompted by several planning efforts and developments that would have significant impacts on Tillamook's downtown. The planning efforts included improvements on US 101/OR 6, the Hoquarton Area Plan and the Town Center Plan Update. The projects may reduce the number of on-street parking stalls, affect access to businesses and downtown destinations, and require more signage and communications. The Plan engaged the public on parking challenges and held a workshop to discuss parking management. The document recommends thirteen strategies and includes an implementation schedule and estimated cost.

Recommendation

The TSP update will consider recommended strategies and projects from the Parking Management Plan, including adoption of proposed projects within the plan.

City of Tillamook Downtown Parking District (2016)

Overview

The Parking District provides customer parking and better access to businesses in the District. City Ordinance No. 1216 establishes boundaries for the City of Tillamook Downtown Parking District, which controls or restricts worker, resident, student, volunteer, and resident visitor parking where indicated by approved signs during the days and hours of Ordinance enforcement. Parking restrictions in the Downtown Parking District are intended to promote customer turnover and are timed in 30 minutes, two, three, and eight hours spaces across the District from 9 a.m. to 5 p.m. excluding Sundays and holidays.

Recommendation

The TSP update will consider parking controls and restrictions pursuant to the City of Tillamook's Downtown Parking District.

Hoquarton Waterfront Overlay District Adoption (2016)

Overview

The Hoquarton Waterfront Overlay district ("Waterfront Overlay") was adopted under City Ordinance No. 1313, amending the City of Tillamook Comprehensive Plan. The Waterfront Overlay was adopted following the completion of the Hoquarton Waterfront Area Plan (2016), which identified improvements to the multi-modal transportation network within the Hoquarton Area consistent with the US 101/OR 6 Traffic Improvement Project and the Crosstown Connections Project. These improvements are proposed to be adopted as part of the TSP update.

Recommendation

The TSP update will consider adoption of the multi-modal transportation improvements proposed in the Hoquarton Waterfront Area Plan.

Adoption of the Salmonberry Trail (2016)

Overview

Ordinance No. 1318 amended the City of Tillamook Comprehensive Plan and the Code of the City of Tillamook to approve the Salmonberry Trail – a planned regional multi-use bicycle and pedestrian trail between Banks, Oregon in Washington County to the Tillamook Airport south of the City in Tillamook County. The Salmonberry Trail will generally follow the 86-mile-long Port of Tillamook Bay rail right-of-way along the east side of US 101 and/or by sharing portion of US 101. The Port of Tillamook Bay is currently partnering with State agencies and local government jurisdictions and interest groups to plan and build the Salmonberry Trail within sections of the rail right-of-way. The amended Comprehensive Plan states that the Salmonberry Trail will be integrated into the City's bicycle and pedestrian system.

Recommendation

The TSP update will review the Salmonberry Trail project and develop implementing actions for the ongoing planning and development by the Salmonberry Trail Intergovernmental Agency, the Port of Tillamook Bay, and other local jurisdictions.

Wayfinding Plan (2017)

Overview

The City of Tillamook and Tillamook Area Chamber of Commerce Wayfinding Plan describes standards and a location schedule for wayfinding signage throughout Tillamook, for pedestrians, drivers, and cyclists alike.

Recommendation

The TSP update could incorporate a project to fund and implement the Wayfinding Plan to support multiple TSP objectives.

Tillamook/ODOT US 101 and OR 6 Cooperative Improvement Agreement

Overview

This agreement between ODOT and the City of Tillamook details the roles and responsibilities of ODOT and the City as they pertain to the US 101/OR 6 construction project, presently underway as of this writing. Items of note in this agreement that are relevant to the TSP update include:

- ROW ownership and jurisdiction of US 101 and OR 6 is described in detail. In general, ODOT has jurisdiction and control from curb to curb and the City has jurisdiction and control outside the curb areas (sidewalks).
- The city is obligated to maintain to state standards the intersection of US 101 and Front Street, 2nd Street, OR 6 and Laurel Avenue, and the crosswalks to Hoquarton Park.
- The City is generally responsible for sidewalks, curbs, directional signage, enforcing encroachment into roadway airspace, lighting electricity expenses, maintenance of pedestrian luminaires, and stormwater facility maintenance within the project area.
- The City will own the frontage road on the east side of US 101 south of Hoquarton Park after project completion.
- ODOT will maintain US 101 and OR 6, including traffic signals.

Recommendation

Projects and policies related to US 101 and OR 6 will consider the terms of this agreement; of particular note are requirements for maintaining certain intersections to state standards and City jurisdiction and maintenance responsibilities for sidewalks and other appurtenances outside of the roadway.

County Plans and Policies

Tillamook County Road Construction Plan Standards

Overview

Also known as "Appendix B" of the Public Road Improvement Ordinance, the Tillamook County Road Construction Plan Standards set road improvement standards for any plans submitted to the Road Department for review.

Recommendation

The TSP update will consider the Tillamook County construction standards as it advances recommended road improvements on any county-owned facilities. Designs that do not conform to County standards may be approved at the discretion of the City Engineer and City Council.

Tillamook County Transportation System Plan (2005)

Overview

The Tillamook County Transportation System Plan ("County TSP") serves as the transportation element of the Tillamook County Comprehensive Plan. The County TSP sets broad goals for the transportation system consistent with Oregon Revised Statute (ORS) 660-012, also known as the Transportation Planning Rule (TPR). The County TSP provides standard cross-sections for roads within the County road functional classification system. The document identifies modal challenges related to the freight,

pedestrian, and bicycle system and proposes solutions. The County TSP also recommends a prioritized list of specific roadway, parking, pedestrian, and bicycle improvements throughout Tillamook County and along segments of state highways.

Recommendation

County TSP guidance, standards, project recommendations, and identified funding sources will be considered in the TSP update for county-owned roadways within the City of Tillamook. Tillamook County maintains and has jurisdiction over the following roads: Olsen Road, Tillamook River Road, Wilson River Loop, Brookfield Avenue, Makinster Road, Goodspeed Road, Marolf Loop, McCormick Loop, Latimer Road, Schild Road, Trask River Road, 12th street from Evergreen Drive to Marolf Loop, 3rd Street, from Evergreen Drive to Marolf Loop.

Tillamook County Multi-Jurisdictional Natural Hazards Mitigation Plan (2017)

Overview

The Natural Hazards Mitigation Plan (NHMP) is currently under development in coordination with Tillamook County, the City of Tillamook, FEMA, and other organizations. As of this writing, some chapters of the plan have been drafted. Potential plan actions that may affect the TSP update include:

- Relocating the City's water transmission main: the water transmission main runs under the Port of Tillamook Bay airport and is in need of repairs.
- Participate in the update of Tillamook County's Emergency Operations Plan: if this action occurs during the TSP update process, it could inform lifeline routes identified/considered in the TSP.
- Preserve natural areas related to flooding: this action could affect TSP projects that would disturb natural areas.

Recommendation

These draft actions, and any others that emerge from the NHMP process, will be considered during the TSP update, especially as they relate to transportations system safety and security.

State Plans, Policies, and Statutes

The Oregon Transportation Planning Rule is reviewed in Technical Memorandum #3 Regulatory Review separate from the statutes included in this document.

Oregon Statewide Transportation Improvement Program (STIP)

Overview

The Statewide Transportation Improvement Program (STIP) is Oregon's four-year transportation capital improvement program. The STIP documents funding sources and implementation schedules for transportation improvement projects and programs throughout the state. The STIP divides projects and programs into two broad categories: *Fix-it* and *Enhance*. *Fix-it* activities are those that fix or preserve the transportation system, while *Enhance* activities are those that enhance, expand, or improve the transportation system.

As of the writing of this plan, the 2015-2018 STIP includes several right-of-way and local engineering projects, such as bridge replacements, roadway grading and drainage, as well as the Crosstown Connections Project.

Recommendation

The TSP will consider the effects the STIP as it may impact city streets.

Oregon Freight Plan (2011)

Overview

The purpose of the Oregon Freight Plan (OFP) is to “improve freight connections to local, state, regional, national, and global markets in order to increase trade-related jobs and income for Oregon workers and businesses.” The OFP identifies a number of challenges facing Oregon’s freight system including system operation and development, safety, communications, environmental considerations, and funding. Implementation actions to improve the freight system include working with cities and counties to consider the freight system in transportation planning, as well as developing performance measures to help make choices about where to invest in freight improvements. The OFP states that coordination with the overarching guidance provided by the Oregon Transportation Plan will be key to the successful implementation of the plan.

Recommendation

The TSP update will consider the freight system as part of the City of Tillamook’s transportation system, and will identify strategies for better coordinating land use and transportation planning decisions with freight provisions in the OFP and OTP. The freight routes within the City of Tillamook are: Wilson River Loop, 3rd Street, Front Street, 1st Street, Stillwell Avenue, Latimer Road, Trask River Road, 10th Street, 12th Street, US 101, and OR 6. Short segments of the following roads are also designated freight routes: Cedar Avenue, Birch Avenue, and Del Monte Avenue.

Oregon Transportation Plan (2006)

Overview

The Oregon Transportation Plan (OTP) and its constituent topic and mode plans form the state’s long-range multimodal transportation system plan (TSP). The OTP provides an overarching policy framework to tie together the state TSP topic and mode plans by establishing goals, policies, strategies, and initiatives that address challenges and opportunities facing Oregon’s transportation system. The OTP also establishes a prioritization framework for transportation improvements in the context of a variety of future funding scenarios. A major emphasis of the OTP calls for the expansion of ODOT’s role in funding non-highway investments, including pedestrian, bicycle, and public transportation facilities throughout the state.

Recommendation

The TSP update will conform to goals, policies, and implementation strategies established by the OTP and its constituent topic and mode plans. These plans are summarized below.

Oregon State Rail Plan (2014)

Overview

The Oregon State Rail Plan (OSRP) is one of several statewide transportation mode and topic plans that refine, apply, and implement the long-range vision of the Oregon Transportation Plan (OTP). The OSRP addresses needs in the statewide rail system, including both passenger and freight rail modes. The OSRP also includes example projects, organized by type.

Recommendation

The TSP update will consider the goals, policies, and example projects established by the OSRP.

Oregon Highway Plan (and amendments) (1999-2011)

Overview

The Oregon Highway Plan (OHP) is a functional element of the Oregon Transportation Plan. The OHP establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the Oregon Transportation Plan (OTP). Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. Policies relevant to the Tillamook TSP include:

- **Policy 1A: State Highway Classification System** – this policy develops and applies the state highway classification system to guide ODOT priorities for system investment and management
- **Policy 1B: Land Use and Transportation** – this policy recognizes that both the State and local government must coordinate in land use and transportation planning
- **Policy 1C: State Highway Freight System** – this policy calls for balancing the needs of freight with other uses
- **Policy 1F: Highway Mobility Standards** - the performance and mobility standards in the OHP vary by location and adjacent land use type, with a higher level of service expectation in the more rural areas and a lower level of service in urbanized areas
- **Policy 2D: Public Involvement** – this policy requires that affected jurisdictions and the general public be involved in decision-making that affects the state highway system
- **Policy 2G: Rail and Highway Compatibility** – this policy addresses safety at rail crossings; specific actions include eliminating at-grade crossings wherever possible
- **Policy 3A: Classification and Spacing Standards** – access management on state highways (such as OR 6 and OR 131) is addressed by this policy
- **Policy 4B: Alternative Passenger Modes** – this policy expresses State support for alternative travel modes where feasible

Recommendation

Policies in the OHP must be considered for any improvements, modifications, or policies that would affect US 101, OR 6, and OR 131 in the City of Tillamook. State highways carry the majority of through-traffic in Tillamook, and significant local traffic as well. OHP policies provide guidance in developing recommended improvements that would impact the accessibility, mobility, or function of each highway.

Oregon Public Transportation Plan (1997)

Overview

The Oregon Public Transportation Plan (OPTP) is one of several statewide transportation mode and topic plans that refine, apply, and implement the long-range vision of the Oregon Transportation Plan (OTP). The OPTP provides guidance for the development of transit, rideshare, and transportation demand management services over a 20-year period. The OPTP provides technical information on public transportation standards and needs that assist communities preparing the TSPs required under the TPR, and responds to TPR requirements for per capita reductions in vehicle miles traveled in Oregon's metropolitan communities. The OPTP is presently being revised and the new version could be considered during the TSP update, depending on publication date.

Recommendation

The TSP update will consider the public transportation goals of the OPTP in developing policies and plans for the public transportation system.

Oregon Bicycle and Pedestrian Plan (2016) & Design Guide (2011)

Overview

The Oregon Bicycle and Pedestrian Plan (OBPP) is a modal element of the OTP and provides guidance for planning, design, and operation of facilities for bicycle and pedestrian travel. The plan contains standards and designs used on state highway projects for bicycle and pedestrian facilities. The plan states that bikeway and walkway systems will be established on urban highways, as follows:

- As part of modernization projects (bike lanes and sidewalks will be included);
- As part of preservation projects, where minor upgrades can be made;
- By restriping roads with bike lanes;
- With improvement betterment projects, such as completing short missing segments of sidewalks;
- As bikeway or walkway modernization projects;
- By developers as part of permit conditions, where warranted.

The Oregon Bicycle and Pedestrian Design Guide was adopted in 2011 as an appendix to the Oregon Highway Design Manual. The guide includes pedestrian and bicycle treatments for a variety of roadway types and land use character.

Recommendation

The OBPP will consider standards and designs within the OBPP when proposing pedestrian and bicycle projects on state facilities within Tillamook.

Oregon TSP Guidelines (2008)

Overview

The Oregon TSP Guidelines are intended to assist local jurisdictions in the preparation of new TSPs and TSP updates. Step-by-step guidance for TSP preparation emphasizes the linkage between local needs, the availability of transportation funding, and conformity with the applicable elements of the Transportation Planning Rule (TPR) and the 2006 Oregon Transportation Plan (OTP). The guidelines are particularly tailored to help smaller, non-metropolitan planning organization jurisdictions such as the City of Tillamook prepare transportation system plans. The TSP Guidelines are currently being updated and the new version may be referred to depending on timing of completion of the updated guidelines.

Recommendation

The TSP update will conform to the recommendations and guidance provided in the TSP Guidelines.

Oregon Access Management Rules (OAR 734.051)

Overview

Oregon Administrative Rule 734-051 defines the State's role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. The provisions in the OAR apply to the roadways under state jurisdiction within Tillamook, namely US 101, OR 6, and OR 131. The access management rules include spacing standards for varying types of state roadways. It also lists criteria for granting right of access and approach locations onto state highway facilities.

Recommendation

US 101, OR 6, and OR 131 are located on right-of-way that is owned by the state or the City of Tillamook dependent on location. Though Tillamook owns the right-of-way in some locations, access management

standards for US 101, OR 6, and OR 131 apply to the entirety of these highways within Tillamook and must be considered if new road connections or driveway approaches are proposed.

Oregon Resilience Plan (2013)

Overview

In the event of a major earthquake, the City of Tillamook's transportation system will play a crucial role in evacuations, as well as the provision of emergency response services, access to critical buildings, the restoration of utilities, and the reopening of businesses. The Oregon Resilience Plan ("Resilience Plan") makes policy recommendations to address the threat of a major earthquake in the Cascadia subduction zone. Chapter 5 of the Resilience Plan specifically addresses the resilience of Oregon's highway, street, bridge, rail, air, and water transportation systems in the context of a major earthquake.

As of this writing, 526 known unstable slopes directly affect US 101 in Oregon – a key transportation corridor in the City of Tillamook that provides north-south connectivity through the downtown commercial core. The Resilience Plan designates Tillamook Airport as a moderate priority for seismic enhancement within 20 years.

Recommendation

The TSP update will consider incremental improvements to the City of Tillamook's transportation system in accordance with the long-term recommendations of the Resilience Plan. The TSP update may consider designation and improvement of critical evacuation and "lifeline routes." Within the vicinity of Tillamook, US 101, Netarts Highway (131), OR 6, Latimer Road and Wilson River Loop are designated as lifeline routes.

Other Plans and Guides

US 101/OR 6 Design (2016)

The TSP update will consider the final design documents in developing transportation projects.

US 101/OR 6 Alternatives Analysis Report (2012)

Overview

The US 101/OR 6 Alternatives Analysis Report ("AA Report") describes the expected environmental impacts and proposed mitigation for making a range of improvements to US 101/OR 6 in downtown Tillamook and across Hoquarton Slough, as identified by the *Tillamook Transportation Refinement Plan*. The current US 101/OR 6 construction project resulted from this analysis.

Recommendation

The TSP update will consider the needs of the City at the completion of the US 101/OR 6 project. The TSP update will adopt alternate mobility standards within the specified areas of Downtown Tillamook and the Hoquarton Slough as recommended in the Refinement Plan.

National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide

Overview

NACTO's Urban Bikeway Guide provides design guidelines for urban bicycle facilities based on data and research on best practices from many of the top cycling cities in the world. NACTO's Guide includes standards for bicycle facilities such protected cycle tracks, which are not currently described in AASHTO's Guide for the Development of Bicycle Facilities. NACTO's Guide provides a suite of bicycle facility treatments that can be constructed depending on the type of road and cyclist. Not all design

features are currently approved for use in the 2009 Manual on Uniform Traffic Control Devices (MUTCD), but the Federal Highway Administration intends to include NACTO's design features in the next version of the MUTCD.

Recommendation

NACTO's Guide is not necessarily appropriate for the design of bicycle facilities on state highways, or for the design of projects that intend to use federal funds. However, NACTO's Guide can be used in the development of bicycle improvement projects for Tillamook's city-owned street network. The NACTO Guide could also be referred to when updating city design standards.

Next Steps

The plan and policy review helps set the context in which the TSP will be developed, and calls out relevant plans, policies, and regulations that will be considered during plan development. The plan and policy review will also assist in developing any needed amendments to City planning documents or municipal code.



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Appendix C

Regulatory Review



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MEMORANDUM

Technical Memo #3: Regulatory Review

City of Tillamook TSP Update

DATE REVISED March 6, 2019
TO Tillamook TSP Project Management Team
FROM Darci Rudzinski, APG
Jamin Kimmell, APG

The purpose of this memorandum is to discuss and identify City of Tillamook Comprehensive Plan and Zoning Ordinance provisions that may need to be updated to reflect and implement the updated Transportation System Plan (TSP) and to be consistent and comply with the Oregon Transportation Plan (OTP) and the Transportation Planning Rule (TPR).

The memorandum is organized into two sections:

1. **Comprehensive plan and policy review.** The first section provides an overview of the transportation section of the City of Tillamook Comprehensive Plan and current transportation policies established in the Comprehensive Plan. This policy review will inform Technical Memorandum #4 – Goals, Objectives, and Criteria, which will evaluate existing policies in detail and propose goals and objectives that will guide the project and form the basis of revised transportation policies.
2. **Code audit.** The second section analyzes the City of Tillamook Zoning Ordinance's conformance with the requirements of the TPR and proposes potential code amendments or additions to improve compliance with the TPR or implement potential recommendations of the TSP. The code audit section of this memorandum will primarily inform Technical Memorandum #12 – Implementing Ordinances, which will propose amendments to the Zoning Ordinance to implement the TSP. The recommendations in the code audit will need to be made consistent with Technical Memorandum #10 – Transportation Standards, which will propose new standards for street design, connectivity, access management, and Traffic Impact Analyses (TIA), among other standards.

1. COMPREHENSIVE PLAN AND POLICY REVIEW

Oregon Transportation Plan (OTP)

The OTP is the State's comprehensive transportation plan. The planning horizon of the current plan extends through 2030. Its purpose is to establish goals, policies, strategies, and initiatives for long-range transportation planning in the state.

The OTP emphasizes maximizing the investment in the existing transportation system, integrating transportation and land use regulations, and integrating the transportation system across jurisdictions and modes. The following are key initiatives in the OTP:

- Maintain the existing transportation system to maximize the value of the assets. If funds are not available to maintain the system, develop a triage method for investing available funds.
- Optimize system capacity and safety through information technology and other methods.
- Integrate transportation, land use, economic development, and the environment.
- Integrate the transportation system across jurisdictions, ownerships, and modes.
- Create a sustainable funding plan for Oregon transportation.
- Invest strategically in capacity enhancements.

The OTP also incorporates a number of modal and topic area plans that provide more detailed policies and strategies to guide both state and local transportation planning and investments. These plans and the OTP are reviewed in Technical Memorandum #2. A review of the adopted City of Tillamook Comprehensive Plan policies, including an assessment of where local policy could be strengthened in order to be more consistent with state objectives, is found in the next section of this memorandum.

City of Tillamook Comprehensive Plan

The 2003 City of Tillamook TSP is incorporated by reference into the 2012 City of Tillamook Comprehensive Plan. Transportation information and policies are located within Chapter 7 of the Comprehensive Plan (Public Facilities and Services). Below is a review of Chapter 7 of the comprehensive plan that identifies sections that will need to be updated to be consistent with the updated TSP. Additionally, the review assesses current transportation policies in relation to state guidelines established by the OTP and its associated modal and topic area plan.

Background. This section presents a short history of transportation planning in Tillamook, followed by a description of the issues associated with strip commercial development, used to illustrate the importance of the integration of transportation and land use planning. This section may not reflect the wide range of goals and issues that the TSP intends to address. Additionally, this section portrays issues associated with development along US 101 as a prime concern for the TSP. This section should be reviewed to determine if it reflects the entire range of transportation goals and issues that are important to the community.

The Transportation System Plan. This section identifies the 2003 TSP and describes the content of the document. The reference to the 2003 TSP will need to be updated. Some of the language pertaining to the content of the TSP may remain accurate, but should be reviewed and updated once the draft TSP is complete.

Modal Elements of the TSP. The following sections of the Comprehensive Plan provide summaries of the seven modal elements of the 2003 TSP: Highways, Streets, Freight, Pedestrian, Bicycle, Transit, and Railroad. The sections include both existing conditions, policy priorities, and some recommended projects or improvements. This section should be replaced with information that is consistent in format and content with the updated TSP.

Policies. Transportation policies are included alongside policies related to other public facilities and services, including water, sewer, and stormwater. The policies are intended to implement the city's overall objective for public facilities and services:

***Objective No. 1 for Public Facilities and Services.** Provide efficient, reliable public facilities and services adequate to maintain the health, safety and welfare of Tillamook's citizens, and meet the needs of residential, commercial and industrial land uses throughout the City.*

The Comprehensive Plan includes 15 transportation policies (Policies D26-D41). The policies are not organized under any additional goals or objectives. These policies were modified following the 2003 TSP to ensure consistency with the Goals and Objectives in the TSP. These policies will need to be revised or replaced in order to be consistent with the updated Goals and Objectives and the recommendations of the updated TSP.¹ Policy areas that will be addressed as part of the TSP update to be consistent with local and state goals and objectives, and that are not currently reflected in Comprehensive Plan Policies, include the following:

- Prioritize protecting and enhancing existing facilities over expanding capacity or building new facilities, recognize opportunities to use technology to optimize performance.
- Emphasize need for coordination across jurisdictions.
- Support for local mobility standards and mobility targets; for state highways, support access management that is consistent with state standards and appropriate land uses around highways.
- Broaden policies related to bicycling to recognize importance of a connected and safe network of facilities.
- Address opportunity and need to connect bike and pedestrian facilities to transit stations.
- Recognize opportunity for bike and pedestrian facilities to support economic development and tourism.

¹ The city may choose to replace the policies with the Goals and Objectives of the updated TSP to reduce redundancy, and incorporate the Goals and Objectives into the Comprehensive Plan by reference.

- Consider stating support for integrating public health criteria into transportation decisions, recognize the health benefits of walking and biking.
- Expand support for providing and encouraging a range of transportation options; encourage carpool, ridesharing, and alternative modes through incentives, marketing programs, and other means.
- Recognize the benefits and opportunities of transit beyond serving transportation disadvantaged, potential to reduce highway demand, environmental benefits, etc.
- Encourage land use policies and zoning provisions that support transit.
- Directly address need to preserve strategic freight corridors and local freight routes
- Broaden support for preservation or enhancement of rail facilities, integration with the rest of transportation network, appropriate land uses, and potential for intermodal freight connections.
- Broaden support for preservation or enhancement of airport, protection from incompatible land uses, and integration with rest of transportation system.
- Establish new policy in support for safety in general, across all modes, including planning, project design, safety infrastructure, etc.
- Integrate resilience into transportation planning, including special consideration for lifeline routes, assessments of risks and need for mitigation plans.
- Address the role of transportation system in greenhouse gas emissions and climate change, support planning and investments to reduce emissions.

2. CODE REVIEW

Transportation Planning Rule (TPR)

The Transportation Planning Rule (TPR) (OAR 660-012) implements Statewide Planning Goal 12 (Transportation), which is intended to promote the development of safe, convenient, and economic transportation systems that are designed to maximize the benefit of investment and reduce reliance on the automobile. The TPR includes direction for preparing, coordinating, and implementing TSPs. TPR Section -0045 (Implementation of the Transportation System Plan) requires local governments to amend their land use regulations to implement the TSP. It also requires local governments to adopt land use and subdivision regulations to protect transportation facilities for their identified functions.

TPR Section -0060 (Plan and Land Use Regulation Amendments) addresses amendments to plans and land use regulations. It specifies measures to be taken to ensure that allowed land uses are consistent with the identified function and capacity of existing and planned transportation facilities. Local code requirements that address this TPR provision include: access control measures; standards to protect future operations of roads; expanded notice requirements and coordinated review procedures for land use applications; procedures that specify needed transportation improvements as a possible condition of approval; and regulations ensuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities,

and performance standards of facilities identified in the TSP. Section -0060 also establishes criteria for identifying the significant effects of plan or land use regulation amendments on transportation facilities, actions to be taken when a significant effect would occur, identification of planned facilities, and coordination with transportation facility providers.

City of Tillamook Zoning Ordinance

The City of Tillamook TSP is incorporated by reference into the City of Tillamook Municipal Code and Zoning Ordinance. The TSP is referenced in section 151.04 of Title XV (Land Usage). All regulations relevant to transportation planning are located in Title XV, which includes chapters on general development regulations, the building code, the subdivision code, and the zoning code. The TSP is also referenced in the Tillamook Public Works Design Standards.

Table 1 provides an evaluation of the City of Tillamook's Zoning Ordinance (Title XV – Land Usage of the Tillamook Municipal Code) based on Sections -0045 and -0060 of the TPR. The evaluation includes findings confirming whether existing code language complies with the TPR. Where necessary, Table 1 provides recommendations for amending the code to implement the expected outcomes of the TSP update and to better address TPR requirements.

Table 1. TPR Code Audit

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
OAR 660-012-0045: Implementation of the Transportation System Plan (1) Each local government shall amend its land use regulations to implement the TSP.	
<p>(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances, do not have a significant impact on land use:</p> <p>(A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals;</p> <p>(B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards;</p> <p>(C) Uses permitted outright under ORS 215.213(1)(m) through (p) and 215.283(1)(k) through (n), consistent with the provisions of 660-012-0065; and</p> <p>(D) Changes in the frequency of transit, rail and airport services.</p> <p>(b) To the extent, if any, that a transportation facility, service, or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is</p>	<p>This section of the TPR defines transportation facilities and improvements that are not subject to land use regulations. The code defines transportation facilities and improvements in a manner largely consistent with this TPR section, as follows (Section 153.003):</p> <p><i><u>Transportation Facilities and improvements:</u> the physical improvements used to move people and goods from one place to another (e.g. streets, railroad tracks, sidewalks, pathways, bike lanes, airports, transit stations, bus stops, etc.). Transportation improvements include the following:</i></p> <p>(a) Normal operation, maintenance;</p> <p>(b) Installation of improvements within the existing right-of-way;</p> <p>(c) Projects identified in the adopted Transportation System Plan not requiring future land use review and approval;</p> <p>(d) Landscaping as part of a transportation facility;</p> <p>(e) Emergency Measures;</p> <p>(f) Street or road construction as part of an approved subdivision or partition;</p> <p>(g) Transportation projects that are not designated improvements in the Transportation System Plan; (Conditional Use Permit for Transportation System Facilities and Improvements) and</p> <p>(h) Transportation projects that are not designed and constructed as part of an approved subdivision or partition (Conditional Use Permit for Transportation System Facilities and Improvements).</p> <p>The 2003 TSP recommended that items (a) through (f) should be permitted outright in all residential, commercial, and industrial zones, and the Airport Overlay zone. However, these</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment.</p>	<p>facilities are not listed as a permitted use in these zones, apart from the Airport Overlay. It should be noted that TSP projects within existing rights-of-way are permitted outright and not subject to zoning requirements.</p> <p>Pursuant to section 153.070(f), transportation facilities or improvements that are not identified in the TSP or part of an approved subdivision or partition application—items (g) and (h) in the definition—are designated conditional uses in all zones. This provision addresses this TPR requirement by providing a path for land use review of transportation facilities and improvements that are not identified in the TSP, but may be consistent with comprehensive plan policies or necessary to be aligned with the city’s land use regulations.</p> <p>Additionally, the 2003 TSP recommended that all Transportation Facilities and Improvements, including those identified in the TSP, be designated a conditional use in the Open Space, Limited Use Overlay, Flood Hazard Overlay, Hazard Overlay, and Water Resource Protection Overlay Zone. However, transportation Facilities and Improvements are not listed as a conditional use in these zones. The Hazard Overlay zone specifies that items (g) and (h) are subject to a conditional use approval. That requirement, however, is redundant as section 153.070(F) specifies that all Transportation Facilities and Improvements (1) not designated in the TSP or (2) approved as part of a subdivision or partition are subject to a Conditional Use application in all zones.</p> <p>Recommendation: Reconsider the recommendation of the 2003 TSP to permit outright all transportation facilities that are consistent with the TSP—items (a) through (f)—in all residential, commercial, and industrial zones, and the Airport Overlay and to designate all Transportation Facilities and Improvements as conditional uses in the identified zones.</p>
<p>(c) In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or requires interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is</p>	<p>Referenced TPR Section -0050 addresses project development and implementation. Project development may or may not require land use decision-making. The TPR directs that during project development, projects authorized in an acknowledged TSP will not be subject to further justification regarding their need, mode, function, or general location. This</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>consistent with 660-012-0050. To facilitate implementation of the TSP, each local government shall amend regulations to provide for consolidated review of land use decisions required to permit a transportation project.</p>	<p>requirement can be addressed by permitting outright all projects identified in the TSP, as identified in the recommendation addressing subsection (a), above.</p> <p>TPR Section -0040 also requires that local governments provide notice to ODOT for any development application that may impact a state facility. The City's Notice of Hearings requirements under Section 153.004(12)(D) addresses this requirement.</p> <p>Section 153.004(1)(B) allows for a consolidated review of land use decisions, which addresses the second clause of this subsection.</p> <p>Recommendation: Existing provisions in the code address this TPR requirement. No changes are recommended.</p>
<p>(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities corridors and sites for their identified functions. Such regulations shall include:</p>	
<p>(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;</p>	<p>Access management standards are addressed through section 153.051 – Site Development Standards. Section 153.051(9) defines access management standards and requirements. Access spacing standards vary according to the functional classification of the roadway.</p> <p>Block length also affects access management. Section 153.051(13) regulates block sizes pursuant to the functional classification of the street. Block size in new subdivisions must conform to these standards, as Chapter 152 – Subdivisions defers the regulation of streets and blocks to the Site Development Standards section (153.051). The block length standards are as follows:</p> <ul style="list-style-type: none"> • Maximum block length for local and collector streets: 500' in the Neighborhood Commercial, Town Center and Central Commercial zones; 600' in all other zones. • Arterial streets: Minimum length of 1,000' and maximum length of 1,800'. <p>No code provisions define street spacing standards according to functional classification.</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
	<p>Recommendation: Existing code provisions address this requirement. Existing access spacing and block length standards may need to be updated if recommended by the TSP. Additionally, a reference to street spacing standards in the updated TSP could be added to the code to ensure appropriate levels of connectivity with future development. Adding spacing standards, or a reference to the TSP standards, would be appropriate in section 151.013(11) – Minimum Street Standards.</p>
(b) Standards to protect the future operations of roads, transitways and major transit corridors;	<p>Section 153.073(9)(A) establishes that a Traffic Capacity Analysis (TCA) may be required, at the discretion of the City Planner or Planning Commission, for any applications that require Site Plan Review. The intent of a TCA is to mitigate the impacts of development on traffic flow, circulation, and safety. The provision establishes a minimum LOS of D for all intersections impacted by a development. Considerations for pedestrian and bicycle usage are also required by this provision, but the provision does not provide specific guidance for how to analyze pedestrian and bicycle traffic.</p> <p>Section 153.004(8)(P) requires that all applications for zone changes, UGB amendments, or conditional use permits be consistent with the planned transportation system. Subsection (c) requires a Traffic Impact Study for amendments that may have a significant impact on transportation facilities. This provision references a “Section XXX - Traffic Impact Study” that does not exist.</p> <p>Recommendation: Existing code provisions generally address this requirement, but the following improvements are recommended:</p> <ul style="list-style-type: none"> • Consider establishing more objective threshold(s) for when a Traffic Capacity Analysis is required, such as by the number of trips generated or specific potential safety issues. • Review the requirements of the TCA to ensure they align with current best practices for traffic impact analyses and ODOT standards, and are consistent with the recommendations of the updated TSP. For example, the code could provide

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
	<p>more specific direction for how to analyze the traffic flow and safety conditions for pedestrians and bicyclists.</p> <ul style="list-style-type: none"> The criteria related to transportation analysis requirements for zone changes, UGB amendments, and conditional use permits should be reviewed and, if appropriate, the reference to “Section XXX – Traffic Impact Study” should be corrected to reference Section 153.073(9)(A) – Traffic Capacity Analysis.
(c) Measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation;	<p>Section 153.030 establishes the Airport Overlay zone. The purpose of the zone is to prevent air space obstructions and other land use conflicts with airport operations. Pursuant to FAA requirements, the zone prevents development that would interfere with imaginary surfaces. The zone does not establish a noise corridor.</p> <p>Recommendation: Existing code provisions address this requirement. The TSP may consider if a noise corridor and associated land use controls are necessary to further protect airport operations.</p>
(d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;	<p>Section 153.004(1)(B) allows for a consolidated review of land use decisions.</p> <p>Recommendation: Existing code provisions address this requirement. No changes are recommended.</p>
(e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;	<p>Section 153.004(14)(H) establishes that the City Planner may apply conditions of approval for applications submitted for Administrative Review. Section 153.073(11) establishes that the Planning Commission may apply conditions of approval to all applications submitted for Site Plan Review.</p> <p>Recommendation: Existing provisions in the code address this TPR requirement. No changes are recommended.</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of:</p> <ul style="list-style-type: none"> (A) Land use applications that require public hearings; (B) Subdivision and partition applications; (C) Other applications which affect private access to roads; and (D) Other applications within airport noise corridor and imaginary surfaces which affect airport operations. 	<p>Section 153.004(12)(D) address notice to ODOT. The provision limits notice to ODOT to applications requiring a public hearing and that are within 500' of a state facility, or that will impact a state facility. This standard is more narrow than the standard (f)(A) of this section of the TPR, which requires notice to ODOT of all land use applications requiring a public hearing.</p> <p>Section 153.004(12)(E) requires notice to ODOT for subdivisions, partitions, and all other applications which affect private access to roads. This provision does not require notice to airport operators for applications that could affect airport operations.</p> <p>Recommendation: Existing code provisions address this requirement. Two minor modifications would increase consistency with the TPR:</p> <ul style="list-style-type: none"> • Consider broadening these two provisions concerning notifications to include notice to ODOT for all land use applications that require a public hearing. • Add a requirement to provide notice to airport operators for developments in the imaginary surface overlays that have potential to affect airport operations.
<p>(g) Regulations assuring amendments to land use designations, densities, and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP.</p>	<p>Section 153.004(8)(P) requires compliance with the TSP for all zone changes, UGB amendments, or conditional use permits.</p> <p>Recommendation: See recommendations in response to TPR section -0045 (2)(b).</p>
<p>(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.</p>	

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>(a) Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots.</p>	<p>Section 153.054(13) requires bicycle parking for all new development in the use categories identified in this subsection of the TPR. The required number of bicycle parking spaces are as follows:</p> <ul style="list-style-type: none"> • Multi-family residential: one space per dwelling unit (all must be sheltered) • Retail/office/institutional, transit transfer stations, park-and-ride lots, and general parking lots: one space per 10 vehicle spaces • Elementary/middle schools: one space per 10 students and employees • High schools: one space per 5 students and employees • Colleges/trade schools: one space per 10 vehicle spaces plus one space per dormitory unit <p>This section of the code also establishes design and location standards that are intended to ensure convenient and safe access to bicycle parking spaces.</p> <p>Recommendation: Existing code provisions address this requirement. However, consider the following refinements that may improve bicycle parking conditions and are consistent with the <i>Model Development Code for Small Cities</i>:²</p> <ul style="list-style-type: none"> • Require bicycle parking for industrial development, which is currently not addressed by the “retail/office/institutional” use category. The standard of one space per 10 vehicle spaces would be appropriate for industrial developments. If inappropriate for general industrial development, the requirement could be limited to light industrial areas. • Increase the minimum number of spaces required for retail/office development to one space per 5 vehicle spaces. These uses are more likely to generate bicycle trips. • Establish a minimum of two bicycle parking spaces for developments with less than ten vehicle spaces.

² *Model Development Code for Small Cities*. Oregon Transportation and Growth Management Program. Edition 3.1 (2015). Available at: <https://www.oregon.gov/LCD/TGM/Pages/modelcode.aspx>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
	<ul style="list-style-type: none"> Consider requirements for covered bike parking. Allow applicants to reduce the number of required vehicle parking spaces by increasing the number of bicycle parking spaces above the minimum requirement. For example, a 5% reduction in vehicle spaces could be provided for every two additional bicycle parking spaces.
<p>(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Single-family residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways.</p> <p>(A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers;</p> <p>(B) Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas except that sidewalks are not required along controlled access roadways, such as freeways;</p>	<p>Provisions of this TPR requirement are addressed as follows.</p> <p>(A) Connections between proposed development and adjacent development, transit stops, and community destinations. A subsection titled Pedestrian and Bicycle Access and Circulation is included in the site and building design standards of each of the following zones: Multiple-Use Residential, Neighborhood Commercial, Highway Commercial, Central Commercial, Public and Semi-Public. This subsection is identical across each of these zones and it requires continuous, safe, direct, and convenient internal pathways. Additionally, the provision sets a standard for pedestrian connectivity by requiring mid-block accessways where block lengths exceed city standards or where streets dead-end in a cul-de-sac.</p> <p>The Pedestrian and Bicycle Access and Circulation subsection is also included in Section 153.051 – Site Development Standards. In addition to the requirements identified above, this subsection includes standards for the design and construction of pathways. Section 153.051 applies to all commercial, industrial, multi-family residential, planned unit developments, subdivisions, and partitions; thus, it addresses all the development types identified by this subsection of the TPR.</p> <p>(B) Bikeways and sidewalks. Section 153.051(4) requires that all developments subject to Site Development Standards must comply with Public Works Design Standards. The street design standards are depicted under 153.051(11)(P) in addition to being included in the Public Works Design Standards document. The code depicts two standard cross-sections for a 2-Lane Arterial Road (US 101 – Main, US 101-Pacific Avenue) that are not included in the Public Works Design Standards.</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>(C) Cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes set forth in this section;</p> <p>(D) Local governments shall establish their own standards or criteria for providing streets and accessways consistent with the purposes of this section. Such measures may include but are not limited to: standards for spacing of streets or accessways; and standards for excessive out-of-direction travel;</p> <p>(E) Streets and accessways need not be required where one or more of the following conditions exist:</p> <ul style="list-style-type: none"> (i) Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided; (ii) Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or (iii) Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection. 	<p>The street design standards require bike lanes (8') on arterial streets. Bike lanes can be substituted for on-street parking on collector streets; in these cases, the vehicle travel lanes function as shared lanes with bicycle. Sidewalks are required on all streets.</p> <p>(C) Cul-de-sacs. Section 153.051(K) establishes that cul-de-sacs are generally not acceptable but may be permissible in limited circumstances. Where provided, cul-de-sacs must include an accessway, in accordance with the Pedestrian and Bicycle Access and Circulation standards. The maximum length of a cul-de-sac is 600'.</p> <p>(D) Street spacing standards. The code or Public Works Design standards do not establish minimum street spacing standards. However, the code does establish maximum block length standards per the functional classification of the street in section 153.051(13) and provides general direction for the alignment and future extension of streets in section 153.051(11)(D) and (E).</p> <p>(E) Exceptions for streets and accessways. The three exceptions provided by this subsection of the TPR are provided for streets and accessways in section 153.051(11)(K)(a). Existing code provisions address this requirement.</p> <p>Recommendations:</p> <ol style="list-style-type: none"> 1. Pedestrian and Bicycle Access and Circulation: Existing standards do not address the design of pathways as crosswalks across driveways or parking areas. To ensure visibility of pathways where they function as crosswalks, consider adding a standard that pathways that cross a parking area or driveway are clearly marked with contrasting paving materials. 2. Bikeways and sidewalks: While existing code provisions and street design standards generally address this requirement, consider the following refinements: <ul style="list-style-type: none"> o The minimum vehicle lane width of 12' across all street design standards should be reviewed for consistency with current best practices. A narrower minimum vehicle lane width of 10'-11' may provide opportunities for safer

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
	<p>bikeway facilities—such as protected or buffered bike lanes—or wider sidewalks, where street widths are constrained.</p> <ul style="list-style-type: none"> ○ Consider more specific standards for where bike lanes should be provided on collector streets in lieu of on-street parking or in addition to on-street parking. Shared lanes may not be safe for bicycling use on collector streets that allow travel speeds greater than 25-30 miles per hour. ○ For clarity, remove the cross-section diagrams from section 153.051(11)(P) of the zoning code, or make them identical with the Public Works Design Standards. <p>3. Cul-de-sacs: To further constrain potential for new cul-de-sacs, which limit route choices and connectivity, consider reducing the maximum allowed length from 600' to 400' or the number of households that can be accessed via a cul-de-sac.</p> <p>4. Street spacing standards: See recommendations related to block length and street spacing standards in response to TPR Section -0045 subsection (2)(a).</p>
(c) Where off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle travel, including bicycle ways along arterials and major collectors;	<i>See response and recommendations related to Traffic Capacity Analysis requirements in TPR Section -0045(2)(b) and conditions of approval in Section -0045(2)(e).</i>
<p>(d) For purposes of subsection (b) "safe and convenient" means bicycle and pedestrian routes, facilities and improvements which:</p> <p>(A) Are reasonably free from hazards, particularly types or levels of automobile traffic which would interfere with or discourage pedestrian or cycle travel for short trips;</p>	<p>The recommendations in response to subsection (b) are intended to improve conformance with this definition of "safe and convenient" in the TPR. This definition is largely consistent with the Tillamook code's definition of "safe and convenient", in reference to pedestrian pathways (Section 153.003). Specifically, the following recommendations found in the Recommendations under -0045(3)(b) address safety:</p> <ul style="list-style-type: none"> ● Determine a standard for where shared lanes for bicyclists and vehicles are appropriate on collector streets. The volume and speed of traffic on some

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>(B) Provide a reasonably direct route of travel between destinations such as between a transit stop and a store; and</p> <p>(C) Meet travel needs of cyclists and pedestrians considering destination and length of trip; and considering that the optimum trip length of pedestrians is generally 1/4 to 1/2 mile.</p>	<p>collector streets may interfere with or discourage bicycle travel if bicyclists must share a lane with automobiles.</p> <ul style="list-style-type: none"> • Evaluate the minimum vehicle lane width of 12'. Narrower travel lanes may allow for safer bicycle and pedestrian facilities and promote slower vehicle speeds. • Add a requirement that pathways which cross driveways or parking areas be marked with contrasting pavement to increase visibility of pedestrians. <p>Recommendation: In addition to the above recommendations, the city may consider expanding the definition of “safe and convenient” to include bicycle facilities. The TPR applies this definition to both pedestrian and bicycle facilities. The Tillamook code applies this definition only to pedestrian accessways. Consider adding a clause to the definition of “Bicycle Facilities” in Section 153.004 – Definitions that defines “safe and convenient” in a manner consistent with this definition in the TPR.</p>
<p>(e) Internal pedestrian circulation within new office parks and commercial developments shall be provided through clustering of buildings, construction of accessways, walkways and similar techniques.</p>	<p><i>See responses and recommendations related to pedestrian access and circulation in TPR Section -0045(3)(b).</i></p>
<p>(4) To support transit in urban areas containing a population greater than 25,000, where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)-(g) below:</p>	
<p>(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate;</p>	<p>The City of Tillamook is not required to conform to the requirements of TPR -0045(4) as the city’s population is less than 25,000. However, the City may elect to consider these standards and requirements to support public transit use.</p> <p>The Public Works Design Standards address design for transit facilities in two ways:</p> <ul style="list-style-type: none"> • The standards establish turning radii that are required for streets with transit routes (Exhibit 9).

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
	<ul style="list-style-type: none"> The standards designate areas with transit terminals for the “high” classification of roadway illumination, and streets with transit routes for the “medium classification” of roadway illumination (Section 2.15.3.2). <p>Recommendation: The TSP update will consider the recommendations of the Tillamook County Transportation District Transit Development Plan related to future transit routes and facilities. The TSP update will determine if existing Public Works Design Standards for transit are consistent with plans for transit and determine if revisions or additional design standards are necessary.</p>
<p>(b) New retail, office and institutional buildings at or near major transit stops shall provide for convenient pedestrian access to transit through the measures listed in (A) and (B) below.</p> <p>(A) Walkways shall be provided connecting building entrances and streets adjoining the site;</p> <p>(B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable as provided for in OAR 660-012-0045(3)(b)(E). Pedestrian connections shall connect the on-site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property;</p>	<p>The general requirements for walkways and pedestrian connections in subsections (b)(A) and (B) are addressed by existing Pedestrian Access and Circulation standards. See response and recommendation to TPR -0045 Section (3)(b) for details.</p>
<p>(C) In addition to (A) and (B) above, on sites at major transit stops provide the following:</p>	<p>The requirements of subsection (C) related to building orientation and circulation on sites at major transit stops are not addressed by existing code provisions.</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<ul style="list-style-type: none"> (i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or a street intersection; (ii) A reasonably direct pedestrian connection between the transit stop and building entrances on the site; (iii) A transit passenger landing pad accessible to disabled persons; (iv) An easement or dedication for a passenger shelter if requested by the transit provider; and (v) Lighting at the transit stop. 	<p>Recommendation: Consider adopting site and building design standards specific to sites with major transit stops, in alignment with the requirements of subsection (C). The code language for this amendment would need to determine a definition or reference a list of major transit stops. A list or map of these stops could be included in the updated TSP.</p>
<p>(c) Local governments may implement (4)(b)(A) and (B) above through the designation of pedestrian districts and adoption of appropriate implementing measures regulating development within pedestrian districts. Pedestrian districts must comply with the requirement of (4)(b)(C) above;</p>	<p>The City is not proposing to designate a pedestrian district at this time.</p> <p>Recommendation: No code changes are recommended.</p>
<p>(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools;</p>	<p>Existing code language does not address this TPR requirement.</p> <p>Recommendation: Consider adding requirements for off-street parking (Section 153.054) to include preferential parking for carpools and vanpools in designated employee parking areas in new commercial, industrial, and institutional developments. Note that these requirements can be narrowly applied to parking areas over a certain size or number of parking spaces, and the number of carpool/vanpool spaces required can be calculated as a percentage of total off-street vehicle parking required.</p>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
(e) Existing development shall be allowed to redevelop a portion of existing parking areas for transit-oriented uses, including bus stops and pullouts, bus shelters, park and ride stations, transit-oriented developments, and similar facilities, where appropriate;	<p>Existing code language does not address this TPR requirement.</p> <p>Recommendation: Consider adding provisions in Section 153.054 that allow existing development to redevelop a portion of existing parking areas for transit-related improvements identified in the Tillamook County Transit Development Plan if minimum parking requirements can still be met.</p>
(f) Road systems for new development shall be provided that can be adequately served by transit, including provision of pedestrian access to existing and identified future transit routes. This shall include, where appropriate, separate accessways to minimize travel distances;	<p><i>See the responses and recommendations related to transit access in TPR Sections -0045(4)(a) and -0045(4)(b).</i></p>
(g) Along existing or planned transit routes, designation of types and densities of land uses adequate to support transit.	<p>Documenting land use and existing transit routes and facilities will be part of an existing conditions evaluation to be summarized in Technical Memorandum #5. The following is an overview of existing land use densities adjacent to transit service.</p> <p>The TPR defines “medium to high density” at 12-15 units per acre, but does not define a minimum residential density to support transit. Generally accepted standards for transit-supportive densities are no lower than 7 units per acre for 30-minute headways.³ A mix of uses and concentration of employment density in centers is also supportive of transit service.</p> <p>The primary fixed-route transit service, the Tillamook Town Loop, operates along US 101, OR 131, and through central Tillamook. The route passes through multiple land use zones. The residential standards of the following zones are generally transit-supportive:</p> <ul style="list-style-type: none"> • R0 – Multiple Use Residential (density of 8-30 units per acre)

³ *Transit-Supportive Densities*. Reconnecting America. Available at: <http://www.reconnectingamerica.org/resource-center/transit-supportive-density/>

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
	<ul style="list-style-type: none"> • R5 – Single Family and Duplex Residential (maximum density of about 17 units per acre) • CC – Central Commercial (no minimum or maximum density) • NC – Neighborhood Commercial (no minimum or maximum density) <p>The following zones are less transit-supportive, due to the relatively low densities of people and employees:</p> <ul style="list-style-type: none"> • R7.5 – Single Family Residential (maximum density of about 6 units per acre) • Highway Commercial (residential not permitted outright) <p>Achievable densities are also affected by market demand, off-street parking requirements, landscaping requirements, and many other factors.</p> <p>Recommendation: A more in-depth assessment of the extent to which existing and future transit lines serve transit-supportive land use zones will be part of developing and evaluating transportation system solutions for the TSP update. Transit system recommendations may include the identification of potential opportunities to amend less transit-supportive zones.</p>
(5) In MPO areas, local governments shall adopt land use and subdivision regulations to reduce reliance on the automobile which:	
The City of Tillamook is not located within the boundaries of an MPO; thus, this subsection is not applicable.	
(6) In developing a bicycle and pedestrian circulation plan as required by 660-012-0020(2)(d), local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses.	

TPR REQUIREMENT	TILLAMOOK CODE REFERENCES AND RECOMMENDATIONS
<p>This TPR requirement will be addressed through the TSP planning process. Existing conditions for pedestrian and bicycle circulation will be inventoried and assessed in Task 4.2. Future needs, deficiencies, and potential solutions will be assessed as part of Tasks 4.5 and 5.3.</p> <p>Recommendation: As identified by this subsection of the TPR, consider opportunities to facilitate pedestrian and bicycle travel by creating or enhancing accessways between residential areas and neighborhood activity centers (community destinations) in developed areas. These connections may be financed and constructed with public investment or required as a condition of approval for future private development.</p>	
<p>(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total ROW consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Notwithstanding section (1) or (3) of this rule, local street standards adopted to meet this requirement need not be adopted as land use regulations.</p>	
<p>This TPR requirement will be addressed through the TSP planning process; Task 5.5 will propose Transportation Standards, which include street cross-sections.</p> <p>Recommendation: See recommendations in response to TPR Section -0045(3)(b).</p>	
<p>OAR 660-12-0060: Plan and Land Use Regulation Amendments</p>	
<p>Amendments to functional plans, acknowledged comprehensive plans, and land use regulations that significantly affect an existing or planned transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility.</p>	<p>Section 153.004(8)(P) requires compliance with the TPR -0060 for all zone changes, UGB amendments, or conditional use permits. This section of the TPR was updated in 2012.</p> <p>Recommendation: Language pertaining to “significant effect” determination should be updated to reflect the current TPR. The City should consider referencing the TPR in Section 153.004(8)(P), rather than incorporating the provisions allowed by the State when determining significant effect.</p>



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Appendix D

Goals, Objectives, and Evaluation Criteria



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Tillamook TSP Update: Final Technical Memorandum #4: Goals, Objectives, and Evaluation Criteria

REVISED November 27, 2017

Prepared for: Paul Wyntergreen, City of Tillamook
Ken Shonkwiler, ODOT

Copy to: Kristin Hull, CH2M

Prepared by: Kate Drennan, CH2M
Ryan Farncomb, CH2M

Introduction

This memorandum provides recommendations for updating the City of Tillamook's Transportation System Plan (TSP) goals and objectives. The updated goals and objectives will be adopted as the transportation goals and objectives of the Tillamook Comprehensive Plan. The project team revised the goals and objectives to meet requirements of the Transportation Planning Rule (TPR), reflect state goals and policies in the Oregon Transportation Plan (OTP), and reflect goals and policies contained in local plans. The project team revised the draft goals and objectives based on input from the Project Management Team (PMT), ODOT, the Project Advisory Committee (PAC), and the public.

This memorandum also describes evaluation criteria that will measure the performance of proposed transportation projects and programs with respect to these goals and objectives.

Review and Refinement Process

The PMT, in addition to the PAC, reviewed this memorandum and provided comments. The final goals and objectives are presented below.

Transportation Goals and Objectives

The 2003 Tillamook TSP has 11 transportation goals with 60 related policy objectives. In addition to adding new goals or objectives, this memorandum removes and consolidates goals and objectives.

Goal 1: Coordination

Maintain a Transportation System Plan that is consistent with the goals and objectives of the City of Tillamook, Tillamook County and the state.

Objectives

1. Provide a transportation system that is consistent with other elements and objectives of the City of Tillamook City Comprehensive Plan, Oregon Transportation Plan, and other policy documents.
2. Coordinate with the Port of Tillamook Bay regarding the Tillamook Airport, the Port of Tillamook Bay Industrial Park and the Port of Tillamook Bay shortline railroad.
3. Coordinate land use and transportation decisions to efficiently use public infrastructure investments to:
 - a. Maintain the mobility and safety of the roadway system
 - b. Foster compact development patterns
 - c. Encourage the availability and use of cycling, walking and transit
 - d. Enhance livability and economic competitiveness

Goal 2: Safety

Provide a transportation system that is safe for all users.

Objectives

1. Improve the safety of rail crossings.
2. Identify and develop safe crossings and facilities, including street lighting, for vehicles, bicycles and pedestrians across highways and major arterials.
3. Develop, maintain, and enhance lifeline and evacuation routes in coordination with local, regional, state and private entities. Critical lifeline routes that should be addressed are:
 - Route north of OR 131/OR 6
 - Route to the Tillamook Airport, a critical disaster recovery facility
4. Effectively and safely manage vehicle, pedestrian, and bicycle traffic, prioritizing Safe Routes to Schools programs and projects.
5. Incorporate traffic calming measures to improve safety for pedestrians, bicyclists, and vehicles.
6. Consider transportation system resiliency when developing and designing transportation projects of all kinds.

Goal 3: Livability and Economic Vitality

Provide a transportation system that balances transportation system needs with the community desire to maintain a pleasant, economically vital city and support public health.

Objectives

1. Minimize adverse social, economic and environmental impacts created by the transportation system, including balancing the need for street connectivity and the need to minimize cut-through traffic and speeding in neighborhoods.
2. Preserve, protect and ensure access to the city's significant natural features and historic sites, including the Pioneer Museum.

3. Improve transportation facilities and minimize traffic congestion in the downtown commercial area without major disruption to downtown character.
4. Promote pedestrian-oriented design and the provision of pedestrian amenities in the downtown area, such as pedestrian-scale lighting and street trees.
5. Ensure adequate vehicle and bicycle parking and parking signage in the downtown commercial area, using techniques such as shared parking areas where appropriate.
6. Balance the needs of maintaining access to the Hampton Lumber Company site and of enhancing neighborhood livability.
7. Collaborate with event managers to develop plans and actions for addressing event-based traffic congestion and safety issues, including the ability for emergency vehicles to access facilities.

Goal 4: Accessibility and Connectivity

Develop an interconnected, multimodal transportation system that connects all members of the community to destinations within and beyond the City.

1. Consider the needs of people who are transportation disadvantaged when developing alternatives to meet travel needs.
2. Upgrade existing transportation facilities and work with public transportation providers to provide services that improve access for all users.
3. Develop and maintain travel routes for pedestrians, bicyclists and those using mobility devices.
4. Promote designated freight routes and route alternatives to ease adverse impacts (congestion, noise, safety) of commercial truck traffic in town.
5. Provide a network of arterials, collectors and local streets that are interconnected, appropriately spaced and reasonably direct in accordance with city and state design standards and the Transportation System Plan.
6. Minimize travel distances and vehicle-miles traveled by building connected street grids and limiting cul-de-sac developments.
7. Expand pedestrian, bicycle, and transit-supportive infrastructure through multi-use paths, trails, sidewalks, bikes lanes, and other facilities.
8. Balance local circulation, safety, and access with freight and public transportation needs.

Goal 5: Mobility

Provide a balanced, multimodal transportation system that supports the movement of people and goods.

Objectives

1. Balance the safe and efficient movement of motor vehicles, pedestrians, bicyclists, transit, trucks, and trains within and through Tillamook.
2. Maintain appropriate levels of service on city streets and meet state and local mobility standards.

3. Limit access points on highways in accordance with state standards, and on arterials using techniques such as alternative access points when possible to preserve mobility.
4. Maintain access management standards for new development and existing access problems to preserve the safe and efficient operation of roadways, consistent with functional classification.
5. Pursue adoption of alternate mobility standards for US 101 and OR 6 that balance mobility on the state highway system with community livability.

Goal 6: System Preservation

Maintain and preserve existing transportation infrastructure, and mitigate transportation impacts from new development resulting in changes in land use to comply with state highway performance, mobility, and access management standards.

Objectives

1. Maintain and preserve the roadways within the City of Tillamook to reach a state of good repair.
2. Identify and preserve locations for potential future transportation connections.
3. Require developers to aid in the development of the transportation system by dedicating or reserving needed rights-of-way, by constructing half or full street improvements and by constructing off-street pedestrian, bicycle and transit facilities when appropriate and needed to serve new development.
4. Prioritize sidewalk pavement improvements for the downtown area.

Goal 7: Public Transportation

Support cost-effective and safe public transportation through and within Tillamook.

Objectives

1. Work with the public transportation providers to develop transit systems, ~~and~~ stations, and related facilities in convenient and appropriate locations.
2. Improve signage and amenities at transit stops and stations.
3. Work with public transportation providers to expand transit service as necessary during summer months of peak travel.
4. Coordinate with public transportation providers to identify and address the public transportation needs of people who are transportation disadvantaged.

Goal 8: Pedestrian and Bicycle Facilities

Create an interconnected system of pedestrian and bicycle facilities in Tillamook to encourage increased travel by walking or bicycling.

Objectives

1. Build safe, attractive and convenient pedestrian and bicycle facilities in the downtown area, accessing transit, parks, medical facilities, public open space, and with new development.
2. Preserve and enhance the U.S. 101 coast bicycle route to support bicycle tourism.

3. Support implementation and refinement of important regional trails, including the Salmonberry Trail, Three Capes Scenic Loop, the Oregon Coast Trail, the National Water Recreation Trail and access to Tillamook's waterways.
4. Work to develop safe, connected pedestrian and bicycle facilities near schools, residential and commercial districts, and complete pedestrian loops envisioned in the Parks and Recreation Master Plan.
5. Develop bicycle facilities on all highways, arterial streets, major collectors, and minor collectors.
6. Use unused rights-of-way for greenbelts, walking trails or bike paths where appropriate.
7. Construct bicycle parking facilities in commercial districts, transit stations, schools and other institutional land uses, and in multi-family residential developments to encourage travel by bicycle.

Goal 9: Environment

Provide a transportation system that balances travel needs with the need to protect the environment and significant natural features.

Objectives

1. Promote a transportation system that encourages energy conservation through an efficient street grid.
2. Encourage use of active transportation and transit and development that minimizes reliance on the automobile.
3. Minimize transportation impacts on coastal and inland natural resources.
4. Encourage improvements that minimize the impacts associated with frequent flooding.

Goal 10: Funding

Develop local funding options and seek grants and financing, as appropriate, for city transportation improvements identified in the TSP.

Objectives

1. Develop a transportation priorities and identify funding mechanisms for implementation.
2. Develop and implement a transportation impact fee program to collect funds from new developments to be used for off-site and on-site transportation improvements.
3. Identify funding opportunities for a range of projects in coordination with county, state and federal agencies.
4. Develop improvements that meet applicable local, county, state and federal plans, standards and criteria.

Project Evaluation Criteria

The TSP goals and objectives provide a framework for shaping transportation policies, programs, and evaluating projects. The evaluation criteria below will aid in evaluating projects for inclusion in the TSP

and will be used to prioritize projects for implementation late in the TSP update process. These criteria will measure projects' performance relative to TSP goals and objectives; projects and programs will be rated with a "consumer reports" rating style shown below.

- Fully meets criterion** ●
- Partially meets criterion** ◐
- Does not meet criterion** ○

Proposed Evaluation Criteria

TSP Goal	Criteria
Goal 1: Coordination	Is consistent with local, state, and federal plans and policies
	Supports the City's land use vision
Goal 2: Safety	Improves transportation safety
	Improves crossing safety (rail, pedestrian, etc.)
	Enhances emergency preparedness/community resiliency
Goal 3: Livability and Economic Vitality	Improves or provides access to key destinations (e.g., parks, downtown)
	Addresses parking issues in downtown
Goal 4: Accessibility and Connectivity	Enhances the active transportation or transit network
	Improves facilities for those using mobility devices
Goal 5: Mobility	Enhances mobility for all modes
	Addresses known access issues on state highways or major arterials
Goal 6: System Preservation	Preserves or maintains existing transportation facilities
Goal 7: Public Transportation	Enhances public transportation services (e.g., new routes, shelters)
	Improves bicycle and pedestrian connections to public transportation stops
Goal 8: Bicycle and Pedestrian Facilities	Enhances bicycle and pedestrian facilities within and to downtown
	Enhances bicycle and pedestrian facilities to schools
	Develops new trails or connects to trails, in accordance with local trail plans
Goal 9: Environment	Minimizes impacts to natural resources
Goal 10: Funding	Is cost effective
	Could be eligible for multiple federal, state, or local funding or financing programs

Appendix E

Existing Conditions



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Final Technical Memorandum #5: Existing Conditions

January 5, 2018

Prepared for: Paul Wyntergreen, City of Tillamook
Ken Shonkwiler, ODOT

Copy to: Kristin Hull, CH2M

Prepared by: Eddie Montejo, CH2M
Ryan Farncomb, CH2M
Garth Appanaitis, DKS
Amanda Deering, DKS

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Introduction

This memorandum describes existing conditions and deficiencies for all modes of travel within the City of Tillamook to inform the update to the City's Transportation System Plan (TSP). This memorandum evaluates the City's transportation system of roads, public transportation, air, rail, water, and pipeline facilities, and bicycle and pedestrian facilities. The analysis includes a review of past and existing transportation funding sources, land use, and population trends. The analysis methods used to develop this memorandum are described in *Technical Memorandum #5A: Existing Conditions Methodology*.

Study Area

The City of Tillamook is located in western Tillamook County, on the southeast end of Tillamook Bay, and west of the Tillamook State Forest. The City is about 60 miles west of Portland and less than 10 miles from the Oregon coast. Tillamook is the largest city in Tillamook County with a population of about 5,000 as of 2015 and is the county seat. Dairy farming, timber, fishing, and tourism are the major industries in Tillamook.

The Tillamook TSP study area includes the Tillamook Urban Growth Boundary (UGB) and all areas within the City limits. The northern UGB limit extends north along US-101 from Front Street and Hoquarton Slough to the Wilson River. The western and southern extents are roughly bounded by the Trask River at the terminus of 5th Street and just south of 12th Street, respectively (**Error! Reference source not found.**). The eastern boundary of the City ends near Olsen Road.

The City's transportation network includes state, county, and city roadways, the Port of Tillamook Bay railroad, bicycle facilities, sidewalks, trails, and the Tillamook Airport. The City is bisected east-west by US-101, a state highway connecting Tillamook to the communities of Garibaldi and Bay City to the north and Lincoln City to the south. US-101 is the Main Avenue/Pacific Avenue couplet in downtown Tillamook. The City is bisected north-south by OR-6, which splits into 1st Street and Netarts Highway/OR-131 at Miller Avenue. OR-6 connects Tillamook to US-26 and Portland to the east.

Study Area

Legend

- Highways
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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Land Use

This section describes current land uses and its effects on existing and future transportation conditions. Land uses and major activity centers strongly influence the overall movement of people and goods throughout the transportation system and determine origin/destination points for trips. Figure 2, Tillamook Zoning, illustrates where certain land use types are allowed within the City's UGB. Figure 3, Tillamook Land Use, indicates what land uses exist currently, as well as where there is vacant land, within the UGB. Vacant land within the City is predominately zoned Highway Commercial and is located to the north of the City, along US-101 and along OR-6/OR-131 in the east.

Most of land in the City is zoned residential, served by two lane local roads (**Error! Reference source not found.**, Figure 3). Low and medium density residential development is concentrated in the downtown area east and west of US-101 Main and Pacific Avenues (the US-101 couplet) and south of OR-6/OR-131 (3rd Street). Much of the City's multifamily residential development is located immediately adjacent to OR-6/OR-131 (1st and 3rd Streets). Residential uses are also concentrated near Tillamook Bay Community College, and east of town. Commercial development is primarily located in downtown Tillamook and north along US-101, where numerous shops, restaurants, and community destinations are located.

The Hampton Lumber Company is a major industrial site within the City, located east of US-101, between 3rd and 12th Streets, and Miller Avenue and Evergreen Drive. The Hampton Lumber Company site serves to bifurcate the City into east and west sections by only allowing transportation to the north (on OR-131/3rd Street) and south (on 12th Street). The Tillamook Cheese Factory and the Port of Tillamook Bay are the major industrial sites outside of the City. The Tillamook Cheese Factory is located north of the City and UGB, just east of US-101 between Suppress Road North and Latimer Road North. The Port of Tillamook Bay is located 3.5 miles south of town, off US-101 and Blimp Boulevard. There are other industrial zones north and south of the Wilson River, as well as smaller dispersed industrial sites throughout the City, served primarily by OR-6/OR-131. The Hampton Lumber Company, Tillamook Cheese Factory, and Port of Tillamook Bay are significant community destinations and trip generators (Table 1).



Tillamook Cheese Factory

Source: Tillamook County Creamery Association (2017)

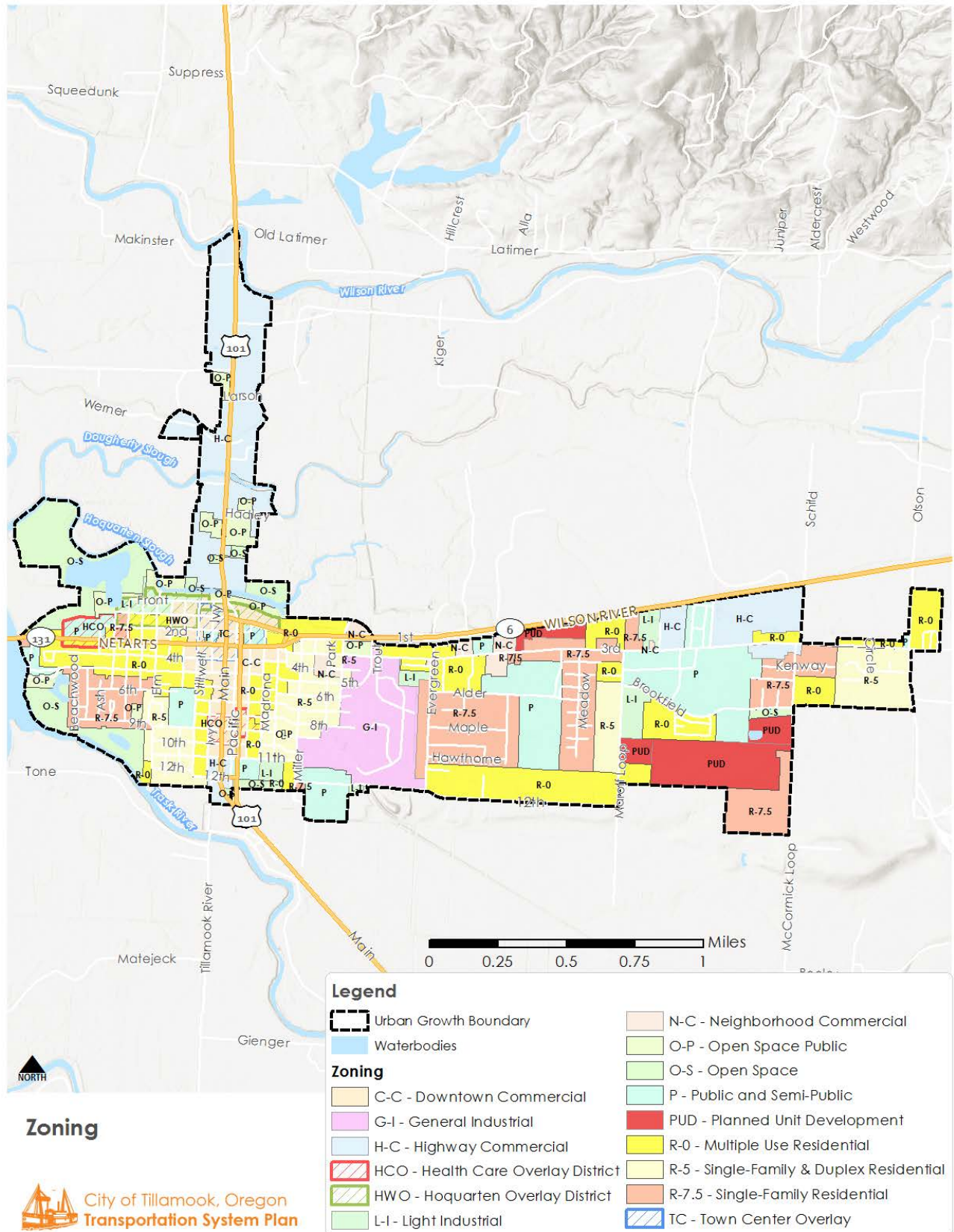
Tillamook is home to several parks, trails, and open recreational areas. The City has four main active parks. Carnahan Park is located on 5th Street near Beechwood on the Trask River, and is a popular boat launching site (Figure 4.). Sue H. Elmore Park is a 1.03-acre special use park and recreation area located at Ivy Avenue and Front Street, just south of the Hoquarton Slough and west of US-101. Sue H. Elmore Park serves as the northern hub of the pedestrian city loop and is a part of the National Recreation Water Trails System. Goodspeed Park is located on the corner of 3rd Street and Del Monte Avenue and features a new skate park. Coatsville Park is located two blocks west of Liberty Elementary School at 9th Street and Elm Avenue, and is a popular play site for neighborhood families.

TABLE 1. TILLAMOOK COMMUNITY DESTINATIONS

Destinations	
Schools	
Tillamook High School	Approximately 675 students, AM-peak and PM pick-up trip generator
Trask River High School	Approximately 78 students, AM-peak and PM pick-up trip generator
Liberty Elementary School	Approximately 320 students, located near popular Coatsville Park, AM-peak and PM pick-up trip generator
Tillamook Junior High	Approximately 330 students, AM-peak and PM pick-up trip generator
South Prairie Elementary	15 classrooms, AM-peak and PM pick-up trip generator
East Elementary School	Grades 4 – 6, AM-peak and PM pick-up trip generator
Tillamook Adventist School (Private)	AM-peak and PM pick-up trip generator located on east side of town
Pacific Christian School (Private)	AM-peak and PM pick-up trip generator located near downtown, just east of US-101 NB (Pacific Avenue)
Tillamook Bay Community College	Approximately 3,500 students, AM/PM-Peak trip generator, as well as all-day trips to and from the college
Attractions	
Tillamook Cheese Factory (located outside of UGB)	Major tourist attraction and trip generator just north of the City
Tillamook County Library	City library and trip generator located in downtown Tillamook
Tillamook County Pioneer Museum	City museum and trip generator located in downtown Tillamook
Tillamook Coliseum Theater	City theatre and trip generator located in downtown Tillamook
Parks/Open Spaces	
Sue H. Elmore Park	Formerly Marine Park; 1.03-acre special use park and recreation area; historic port for the Sue H. Elmore; also includes northern hub of pedestrian city loop.
Goodspeed Park	Located on the east side of town; features park area, tables, restrooms, playground, and newly built skate park
Coatsville Park	Popular play destination for families; located near Liberty Elementary School
Carnahan Park	Popular boat launching site and park on the Trask River
Hoquarton Interpretive Trail	Interpretive trail and park area and trip generator in downtown Tillamook; includes parking lot, bike/ped trail, viewing platform, and trails

Civic/Employment/Transportation	
Tillamook County Courthouse	Major civic destination and trip generator in downtown Tillamook
Tillamook City Hall	Major civic destination and trip generator in downtown Tillamook
Tillamook Town Square Transit and Visitor Center	Trip generator for Tillamook Town Loop and intercity bus routes; also serves as tourist hub for visitors to the City
Tillamook People's Utility District (TPUD)	Customer-owned utility providing electric service in Tillamook County and parts of Clatsop and Yamhill Counties in Oregon.
Hampton Lumber Company	Major industrial site
Port of Tillamook Bay	Major intermodal trip generator located south of the City
Medical	
Tillamook Regional Medical Center	25-bed critical access hospital providing comprehensive in- and outpatient medical services
Food and Beverage	
Pelican Brewery and Taproom	Popular brewery and trip generator on the west end of downtown
Safeway	Only grocer in Downtown Tillamook; large parking lot; major trip generator
Blue Heron French Cheese Company	Popular purveyor of cheese, wine, and gourmet gifts. Popular gathering place for local events, the Blue Heron deli, and gift shop.
Frey Meyer	Major destination on U.S. 101 for groceries, apparel, and electronics

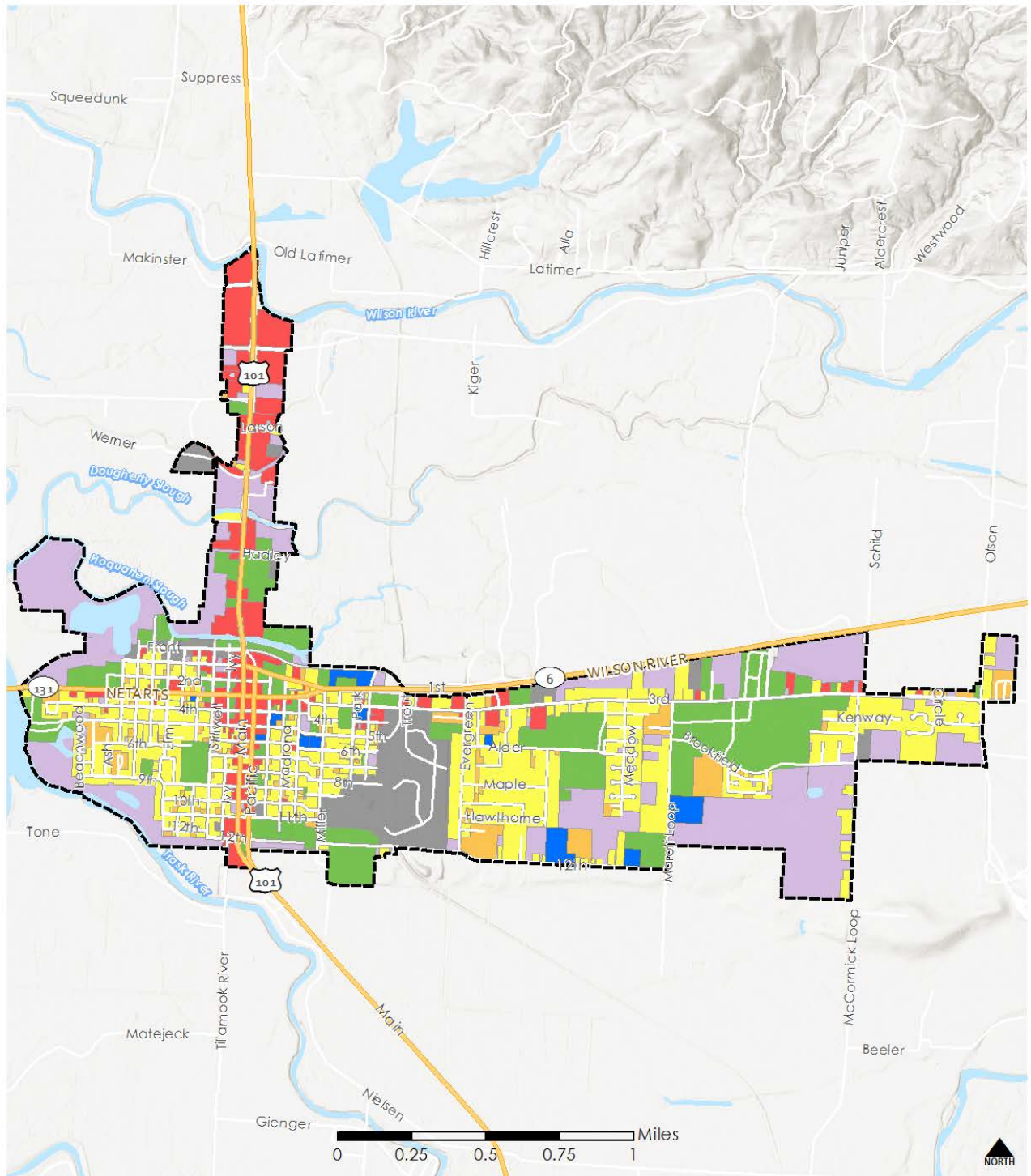
FIGURE 2. TILLAMOOK ZONING



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FIGURE 3. TILLAMOOK LAND USE



Land Use



City of Tillamook, Oregon
Transportation System Plan

Legend

- Highways
- Urban Growth Boundary
- Waterbodies

Land Use

- COMMERCIAL
- SINGLE FAMILY RES
- INDUSTRIAL
- VACANT
- MULTI-FAMILY RES
- PUBLIC / PARK
- CHURCH

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Wetlands and Sensitive Areas

The City of Tillamook encompasses sensitive environmental features, including wetlands, an estuary, floodplains, agricultural lands, and undeveloped open space. The City's primary water resources are the Trask River, Wilson River, and Hoquarton Slough. The Wilson River is formed at the confluence of Devil's Lake Fork and South Fork, and flows west from Tillamook State Forest to its mouth at Tillamook Bay. The Hoquarton Slough, an Army Corp of Engineers-designated navigable waterway, exists within the northern part of the City. The Tillamook area is also home to the Tillamook River to the south and the Kilchis and Miami Rivers just north of the City limits (Figure 4. - Figure 5). The Tillamook Comprehensive Plan goals and objectives for natural resources and wetlands (2012) recognizes the importance of these natural resources and supports their preservation.¹

In 1997, the City of Tillamook Local Wetland Inventory (LWI) identified Cojack Creek, Colby Creek, Dougherty Slough, Holden Creek, Hoquarton Slough, and the Trask River and their associated wetlands as "significant natural resources."² Significant wetlands must have a high level of function in water quality, hydrologic control, fish habitat, or wildlife habitat as defined in the Oregon Freshwater Wetland Assessment Methodology.³ In cooperation with the Oregon Department of Fish and Wildlife, an inventory of Goal 5 Wetlands identified four additional wetland sites located south of Meadow Avenue, parallel to Fairlane Drive, South Highway 101, and at the west end of 5th Street (1999).⁴

The City has also adopted a 50-foot riparian setback adjacent to significant riparian resources based on the Economic, Social, Environmental, and Energy Decision Process (ESEE). Under Statewide Planning Goal 5, ESEE mandates local jurisdictions to carefully analyze and justify decisions affecting significant wetlands (as identified in the LWI) using analysis methods described in the *Goal 5 ESEE Analysis Template*. Based on ESEE analysis, jurisdictions are required to adopt a program to protect significant wetlands. For the purposes of this plan, all waterways within the UGB (including the Trask and Wilson Rivers) are considered significant riparian resources.

¹ City of Tillamook (2012). City of Tillamook Comprehensive Plan. Goals and Objectives for Natural Resources and Wetlands.

² Wilson et. al (1997). City of Tillamook Local Wetlands Inventory (LWI)

³ Oregon Department of State Lands (1996). Oregon Freshwater Wetland Assessment Methodology.

⁴ City of Tillamook (1999). Tillamook Urban Growth Area Wetland Evaluation

Demographic Summary

As of 2017, the City of Tillamook had a population of 4,930, representing about a fifth of the total population residing in Tillamook County.⁵ As compared to the state, the City has younger residents, a less diverse population, and a higher number of residents living below the poverty threshold. Table 2 below describes selected demographics for the City of Tillamook, as well as for Tillamook County and the State of Oregon using 2015 Census data.⁶

TABLE 2. SELECTED DEMOGRAPHICS FOR TILLAMOOK

Demographic Category (2015)	City of Tillamook	Tillamook County	Oregon
Population 18 or under	25%	19%	22%
Population over age 65	14%	22%	15%
Median household income	\$29,889	\$42,581	\$51,243
Households below the poverty level	32%	18%	17%
Households where language other than English is spoken	10%	1%	15%
Minority status	13%	8%	15%
Hispanic origin	11%	10%	12%

Source: US Census Bureau 2011 – 2015 American Community Survey 5-Year Estimate

⁵ Portland State University (2017). College of Urban Affairs: Population Research Center. Preliminary 2017 Population Estimate, November 15, 2017.

FIGURE 4. TILLAMOOK WATERBODIES



Waterbodies



City of Tillamook, Oregon
Transportation System Plan

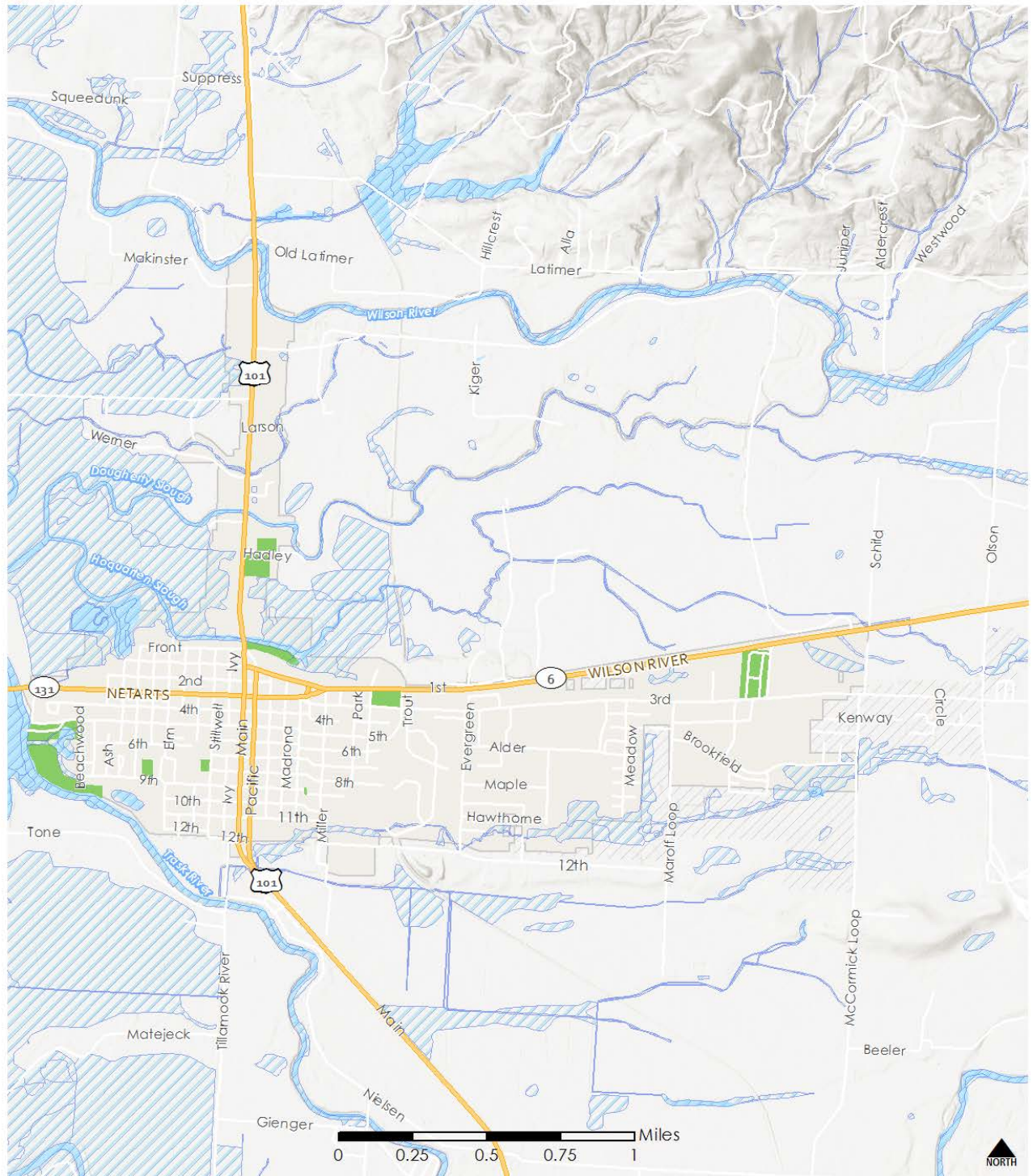
Legend

- | | |
|-----------------------|---------------|
| River | Waterbodies |
| Urban Growth Boundary | Parks |
| Highways | City Boundary |

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FIGURE 5. TILLAMOOK WETLANDS



Wetlands and Sensitive Areas



City of Tillamook, Oregon
Transportation System Plan

Legend

- Highways
- ▨ Wetlands
- Parks
- Waterbodies
- ▨ City of Tillamook
- ▨ Urban Growth Boundary

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Title VI and Environmental Justice Populations

Title VI of the Civil Rights Act requires that no person be excluded from participation or subjected to discrimination based on “race, color, national origin, economic status, disability, or sex.” In addition, agencies must take reasonable steps to ensure that those with limited English language proficiency are afforded equal access to programs, services, and information. The Oregon Department of Transportation (ODOT) has an adopted Title VI plan which details how the agency will address non-discrimination requirements for recipients and sub-recipients of federal funds. To ensure equal opportunity for inclusion in the transportation system planning process, Title VI populations are identified to understand how best to increase opportunities for participation.

The project team reviewed area demographics to inform the development of outreach strategies to reach low-income, minority, and limited-English proficient residents. The City will conduct targeted activities to reach these groups and will make accommodations (e.g. translation services) to encourage their participation. Specific methods for engaging low-income, minority, and limited-English proficient residents is detailed in *Technical Memorandum #1: Public and Stakeholder Involvement Plan*.

Future Growth

Tillamook’s population has been relatively stable during the last five years. Between 2010 and 2015, the City grew by about 136 people. As of 2013, the Oregon Office of Economic Analysis estimates that Tillamook County overall will grow by approximately 15 percent between 2015 and 2040 to over 30,000 people as compared to 26,000 today. With about 20 percent of the county’s population residing in the City of Tillamook, this future growth is expected to place additional demand on the City’s transportation system.

Employment in Tillamook tends to increase with tourism in the summer and decrease in the winter. As a result, several of the City’s key employment sectors are seasonally-based, such as leisure, hospitality, accommodation, food services, and construction. Summer tourism drives employment and a marked seasonality in traffic.

There are few local projections for future employment growth. At the state level, between 2010 and 2015, private sector employment in Oregon grew 9.6 percent, while government sector employment declined 2.2 percent. Oregon Employment Department Industry Employment Projections for 2014-2024 show growth in tourism and retail sectors. Projections for the same timeframe also show declines in several industries that are prevalent in Tillamook, including trade, transportation and utilities; manufacturing; and natural resources and mining.

Major Activity Centers

Tillamook Cheese Factory

Though located outside of the Tillamook City limits, the Tillamook County Creamery Association Visitor Center (TCCA) is a major tourist attraction on the Oregon coast and is a significant source of traffic on US-101 – especially during the summer. Approximately one million people visit the Tillamook County Creamery Association (TCCA) Visitor Center each year, contributing to considerable vehicle traffic on US-101.⁷ Site accesses to the creamery are located along US-101 and Latimer Road. As of this writing, the

⁷ Oregon Tourism Commission (2003). Tillamook Community Profile.

TCCA is constructing improvements at the creamery, including a new visitor center, reconfigured site accesses along US-101, and a reconfigured parking lot.⁸

Downtown Tillamook

Downtown Tillamook is the City's commercial and cultural hub, offering numerous options for shopping, dining, and tourism. The downtown core is roughly bounded by Front and 7th Streets to the north and south, and Stillwell and Madrona Avenues to the west and east, respectively (Figure 6). The greatest concentration of boutique storefronts, specialty services, and eateries are located along the US-101 couplet (SB Main and NB Pacific Avenues). Other destinations in the downtown vicinity include:

- Tillamook County Library
- Tillamook County Courthouse
- Tillamook City Hall
- Tillamook County Pioneer Museum
- Tillamook Coliseum Theater
- Pelican Brewery and Taproom
- Safeway
- Tillamook Town Square Transit and Visitor Center

Tillamook County Fairgrounds

The Tillamook County Fair is a multi-day event held annually at the Tillamook County Fairgrounds, located south of 3rd Street at Wilson River Loop, attracting 75,000 people in 2016. The Fair typically takes place between the 2nd and 3rd week of August, and places significant, but temporary, freight and automobile demand on the City's transportation system.



Aerial view of Tillamook County Fairgrounds
Source: Tillamook County Fairgrounds (2014)

⁸ Tillamook Creamery Association (2017). <https://www.tillamook.com/cheese-factory/new-visitors-center-updates.html>

Port of Tillamook Bay Employment Area

The Port of Tillamook Bay employment area is a major employment center in Tillamook County, comprising more than 1,600 acres of industrial-zoned land. The Port operates several commercial and industrial assets, including the Tillamook Municipal Airport, an Airport Business Park, and the Air Museum. Outside of the UGB, the Port also owns a 200-acre industrial park that hosts multiple manufacturing and development operations, including Stimson Lumber Mill, CHS Feed Mill, and Hallco Industries. Near Space Corporation – a commercial provider of high-altitude, near-space platforms and flight services for government, academic, and commercial customers – employs hundreds within the Port employment area. Most of the Port’s commercial and industrial lands are accessible via US-101.

Tillamook Bay Community College

Tillamook Bay Community College (TBCC) was founded in 1981 and enrolls about 3,500 students. The TBCC main campus is located on the corner of 3rd Street and Marolf Loop Road. In spring 2017, the Partners for Rural Innovation (PRI) Center was opened to support innovation, job readiness, and economic development in the community. The PRI Center houses several community organizations and resources, including an Oregon State University Extension Service, the TBCC Agriculture and Natural Resource degree program, the Tillamook Economic Development Council, the Tillamook Small Business Development Center, and the Visit Tillamook Coast tourism team. The TBCC area is likely to generate consistent trips throughout the day with additional peak AM and PM periods.

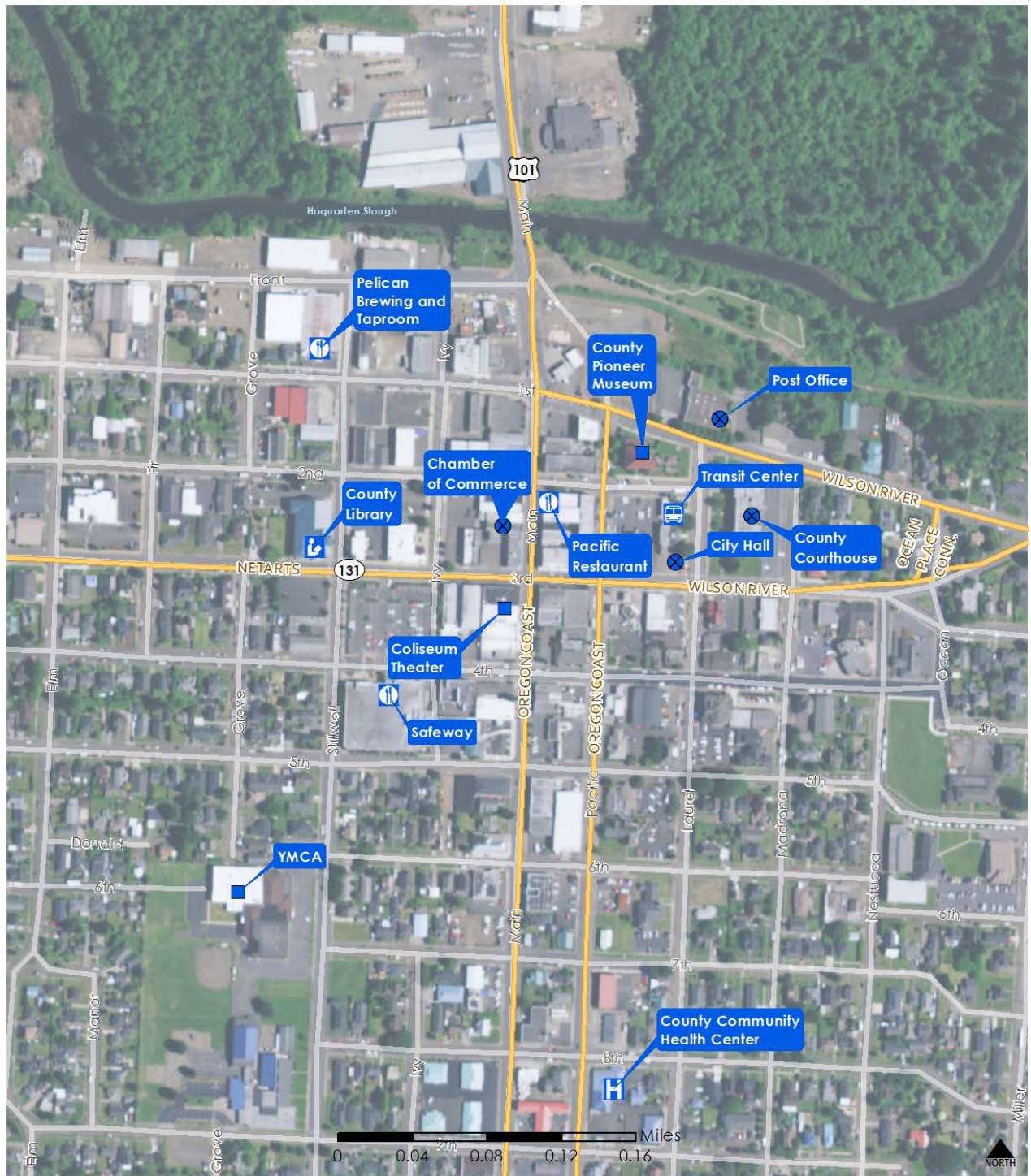
Schools

The City is served by the Tillamook School District, which currently operates four public schools (Figure 7):

- Tillamook High School
- Liberty Elementary School
- Tillamook Junior High
- East Elementary School

Two private schools, Tillamook Adventist School and Pacific Christian School, are also located in Tillamook. Grade schools and high schools are likely to generate peak hour trips in the mornings and afternoons.

FIGURE 6. DOWNTOWN TILLAMOOK



Downtown Tillamook



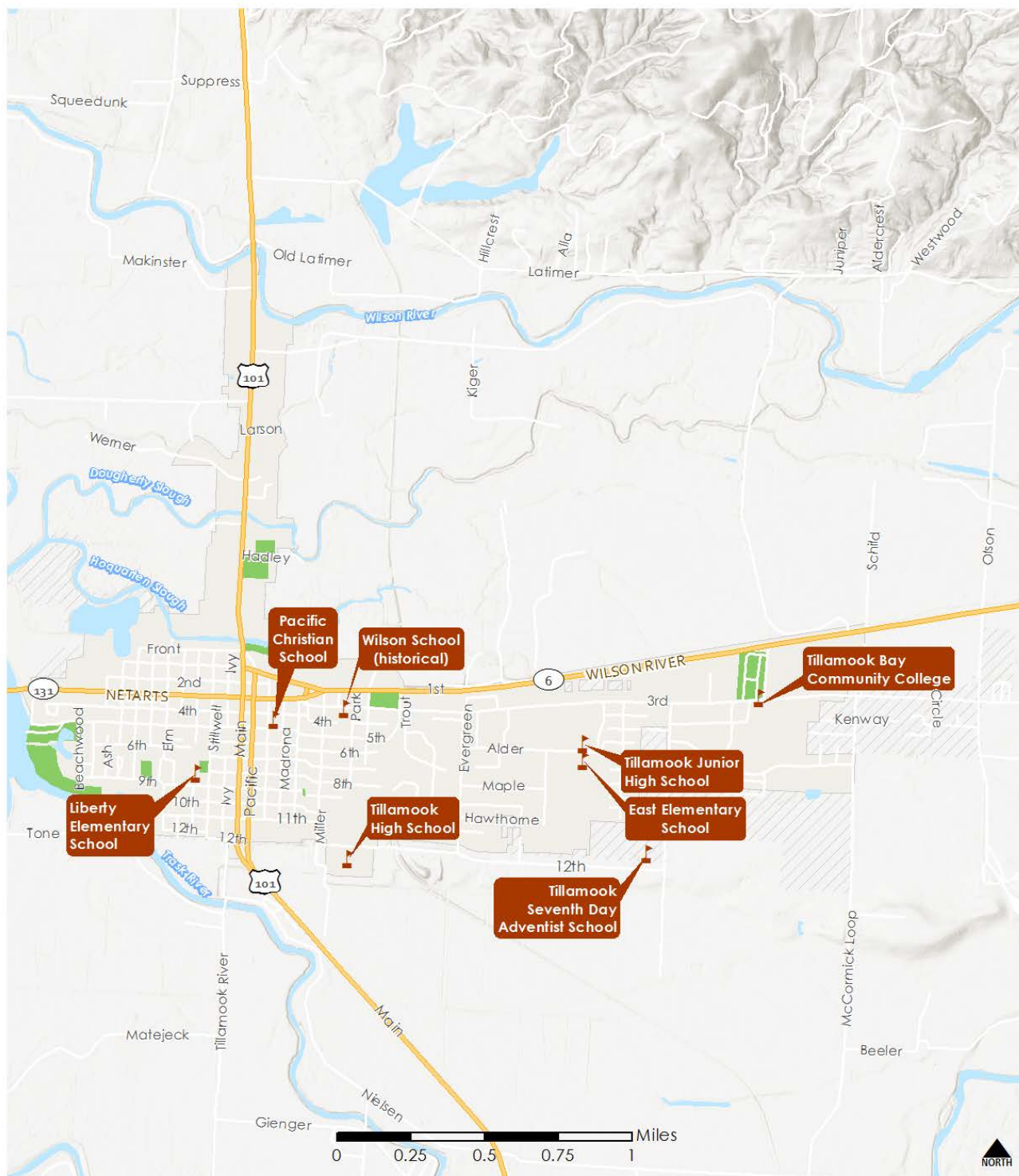
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- Administration
- Community
- Food
- Travel
- Highways
- Health
- Library

FIGURE 7. TILLAMOOK SCHOOLS



Schools



City of Tillamook, Oregon
Transportation System Plan

Legend

- Schools
- Parks
- Highways
- City of Tillamook
- Waterbodies
- Urban Growth Boundary

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Transportation System Inventory

This section summarizes the existing transportation facilities, the conditions and characteristics of those facilities, and deficiencies associated with the transportation system, organized by mode within the Tillamook UGB.

Road Inventory

The existing street network and its characteristics are summarized in the following section. An inventory of all arterial and collector streets was conducted within the City's UGB. In Tillamook, US-101 provides primary north-south connectivity. Other important north-south routes include Stillwell Avenue, Miller Avenue, Evergreen Drive, and Marolf Loop Road. The primary east-west routes consist of OR-6/OR-131 3rd Street. Due to existing development between downtown and the eastern part of the city, east-west connectivity is limited.

Roadway Jurisdiction

State highways that run through the City of Tillamook such as US-101, OR-6, and OR-131 are under the jurisdiction of the Oregon Department of Transportation (ODOT). The facilities listed below are under Tillamook County jurisdiction:

- 3rd Street, east of Evergreen Drive
- Olsen Road
- Tillamook River Road
- Wilson River Loop
- Brookfield Avenue
- Makinster Road
- Goodspeed Road
- 12th Street, from Evergreen Drive to Marolf Loop Road
- Marolf Loop Road
- McCormick Loop Road
- Latimer Road
- Schild Road
- Trask River Road

The remaining public roads are owned and maintained by the City of Tillamook. There are also several smaller private road segments in the city including internal circulation roadways with subdivision and industrial areas.

Functional Classification

To manage the roadway network, the city classifies roadways based on a hierarchy according to the intended purpose of each road as shown in Figure 8. Roadways intended for high usage generally provide more efficient traffic movement (or mobility) through the city; roadways that primarily provide access to local destinations, such as businesses or residences, have lower usage. From highest to lowest intended usage, the classifications are:

- **Arterial Roadways.** The primary function of an arterial roadway is to provide mobility. Therefore, arterials typically carry higher traffic volumes and allow higher travel speeds while providing limited access to adjacent properties.

- **Collector Roadways.** The function of a collector roadway is to collect traffic from local streets and provide connections to arterial roadways. Generally, collectors operate with moderate speeds and provide more access in comparison to arterials.
- **Local Roadways.** The primary function of a local roadway is to provide access to local traffic and route users to collector roadways. Generally, local roadways operate with low speeds, provide limited mobility, and carry low traffic volumes compared with other roadway classifications.

ODOT has also identified the functional classification of the state facilities in Tillamook (Table 3). US-101 is the only locally designated rural principal arterial and OR-6 is the only designated rural minor arterial. Netarts Highway (OR-131) is designated as an urban collector. In addition, US-101 is classified by ODOT as a scenic byway in the adopted 1999 Oregon Highway Plan (OHP)⁹. The OHP also provides for special designation of certain highway segments to guide future planning and management decisions, and to balance the needs of through traffic with local traffic and development. This includes the special transportation area (STA) designation, which applies to the segment of US-101 from 1st Street to the southern UGB limits. STAs have specific objectives for access management, automobiles, pedestrian and bicycle accommodation, transit amenities and development. This may result in lower speeds, narrower lane widths, and wider sidewalks than is otherwise required for the state highway, outside of the STA.

The following table lists characteristics of the ODOT facilities in Tillamook including highway classification, cross section, right-of-way width, and posted speed.

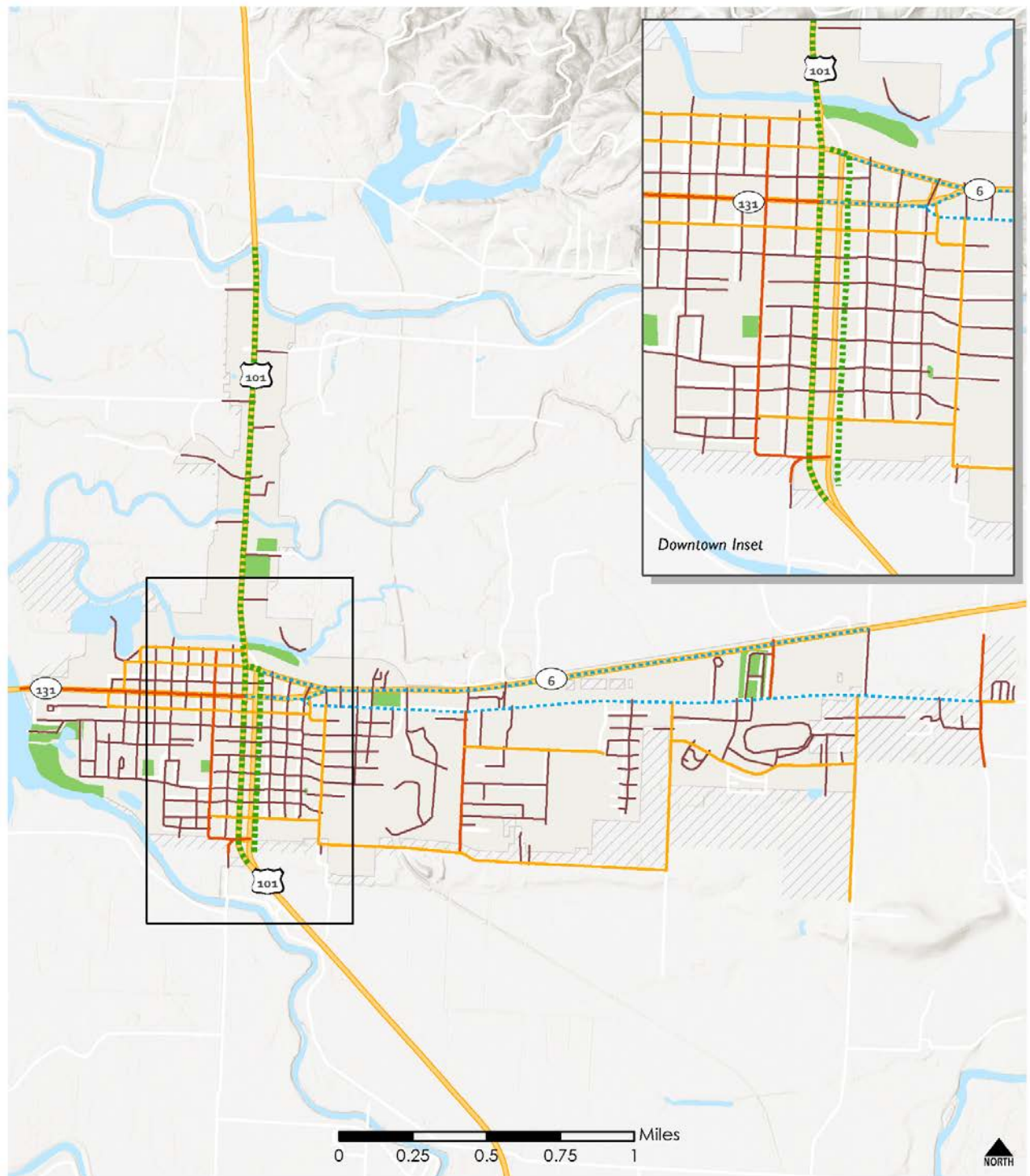
TABLE 3. ODOT ROADWAY INVENTORY

Roadway	Limits	OHP Classification	Cross Section	Typical ROW (feet)	Posted Speed
US-101 (Oregon Coast Hwy)	Northern UGB Limits to Wilson River Loop	Statewide Highway	3 lanes	100-115	45 mph
	Wilson River Loop to Larson Road	Statewide Highway	4 lanes	95-125	45 mph
	Larson Road to Front Street	Statewide Highway	4 lanes	80-140	35 mph
	Main Ave (SB): Front Street to 6th Street	Statewide Highway	2 lanes	60-65	20 mph
	Main Ave (SB): 6th Street to Southern UGB Limits	Statewide Highway	2 lanes	60-90	25 mph
	Pacific Ave (NB): Front Street to 6th Street	Statewide Highway	2 lanes	60-65	20 mph
	Pacific Ave (NB): 6th Street to Southern UGB Limits	Statewide Highway	2 lanes	60-90	25 mph
OR-6 (Wilson River Hwy)	Schild Road to Wilson River Loop	Regional Highway	2 lanes	280-440	55 mph
	Wilson River Loop to Evergreen Drive	Regional Highway	3 lanes	110-180	55 mph
	Evergreen Drive to Del Monte Avenue	Regional Highway	4 lanes	135-160	45 mph
	Del Monte Avenue to Miller Avenue	Regional Highway	4 lanes	90-120	30 mph
	1 st St (WB): Miller Avenue to US-101 North	Regional Highway	2 lanes	60	25 mph

⁹ Oregon Department of Transportation. 1999 Oregon Highway Plan. 1999.

	3 rd St (EB): Miller Avenue to US-101 South	Regional Highway	2 lanes	60	20 mph
OR-131 (Netarts Hwy)	US-101 South to Grove Avenue	District Highway	2 lanes	60	20 mph
	Grove Avenue to Western UGB Limits	District Highway	2 lanes	60	30 mph

FIGURE 8. STREET FUNCTIONAL CLASSIFICATIONS



Functional Classification



City of Tillamook, Oregon
Transportation System Plan

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Functional Class
 ■■■■ Principal Arterial
 - - - - Minor Arterial
 ——— Major Collector
 ——— Minor Collector
 ——— Local

Waterbodies
 Parks
 City of Tillamook
 Urban Growth Boundary

Most roads in Tillamook allow two-way traffic with one lane in each direction. US-101 and OR-6 are the only roads in Tillamook that have more than two lanes. In the downtown area, from 1st to 12th Streets, US-101 becomes a two-way couplet with two lanes in each direction (southbound is Main Avenue and northbound is Pacific Avenue). US-101 merges together south of 12th Street, near the southern city limits. OR-6 is a couplet with two lanes for each direction between US-101 and Miller Avenue, which joins together and becomes a four-lane cross section before Evergreen Drive.

Roadway width varies based on the lane configuration. Turn pockets (generally 200 feet or less) are provided at many intersections, which provide additional roadway width near the intersections.

Posted speeds within the city range from 20 to 45 mph. On OR-6 the speed gradually increases from 25 mph downtown to 45 mph at the railroad crossing. Outside of the city limits, it then increases to 55 mph which continues through the eastern UGB limits. The posted speed along US-101 from the northern city limits to Goodspeed Road is 45 mph. Between Goodspeed Road and the downtown area, the speed limit on US-101 reduces to 35 mph. In downtown, US-101 (SB Main and NB Pacific Avenues) is posted at 20 mph. Just south of the city limits, the speed limit on US-101 increases to 55 mph.

Pavement and Bridge Conditions

In Tillamook, newer roadway segments generally have asphalt surfacing, while many older streets are made of concrete. ODOT reports the pavement condition of roadways within its jurisdiction, rating them on a scale from very poor to very good. Roads in good condition provided smooth driving conditions and generally were free of potholes, cracking and maintenance issues. Roads in fair condition had sections of patching and short sections that require maintenance. Roads in poor condition provided a rough driving surface, with most of their length requiring maintenance because of potholes and cracking. A map of the pavement condition of state facilities is shown in Figure 9, based on 2016 data acquired from ODOT.¹⁰

Generally, the pavement condition of local roads in Tillamook ranges from good with poor (Figures 10-12). The condition of local roads near recent development that includes curbs and sidewalks is considered good. OR-6 is generally good or very good, with the segment downtown between Del Monte Avenue and Main Avenue in poor condition. US-101 pavement condition is rated as fair along the entire segment through Tillamook, except for the northbound segment through downtown (Pacific Ave), which is rated as poor. The current US-101/OR-6 Traffic Improvement Project will reconstruct the roadway, improving pavement conditions on this stretch of US-101. OR-131 is rated as good for the entire segment in Tillamook.

There are five bridges along the state highway system. There are no bridges on local roadways that are being assessed in the TSP. The locations of these bridges can also be found on Figure 9, along with the pavement conditions. There are four bridges along US-101 and there is one bridge along OR-131 at the Trask River. There is also a railroad overcrossing on OR-6 (not shown) that is summarized in the rail section. The bridge across Hoquarton Slough is currently being replaced as part of the US-101/OR-6 Traffic Improvement Project.

Sufficiency ratings from 2016 were acquired from ODOT and were used to determine the condition of the bridges. A bridge with a sufficiency rating of less than 45 is considered poor condition. The Wilson River bridge at the north end of the city has a sufficiency rating of 41.3 and thus is in poor condition. The remaining bridges have a sufficiency rating greater than 45 and are in good condition.

¹⁰ ODOT. ODOT TransGIS. <http://gis.odot.state.or.us/TransGIS/>. 2017.

FIGURE 9. PAVEMENT AND BRIDGE CONDITION

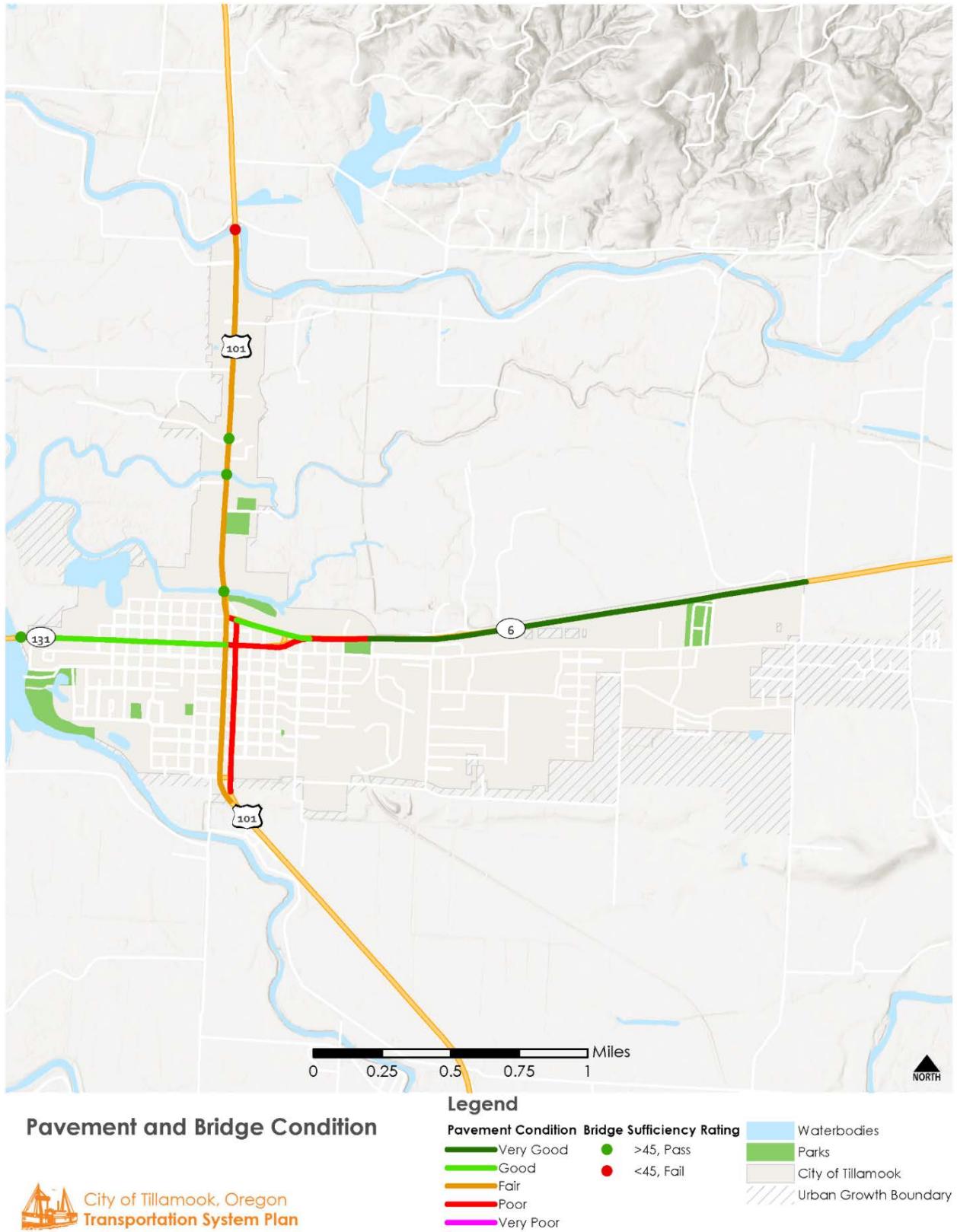
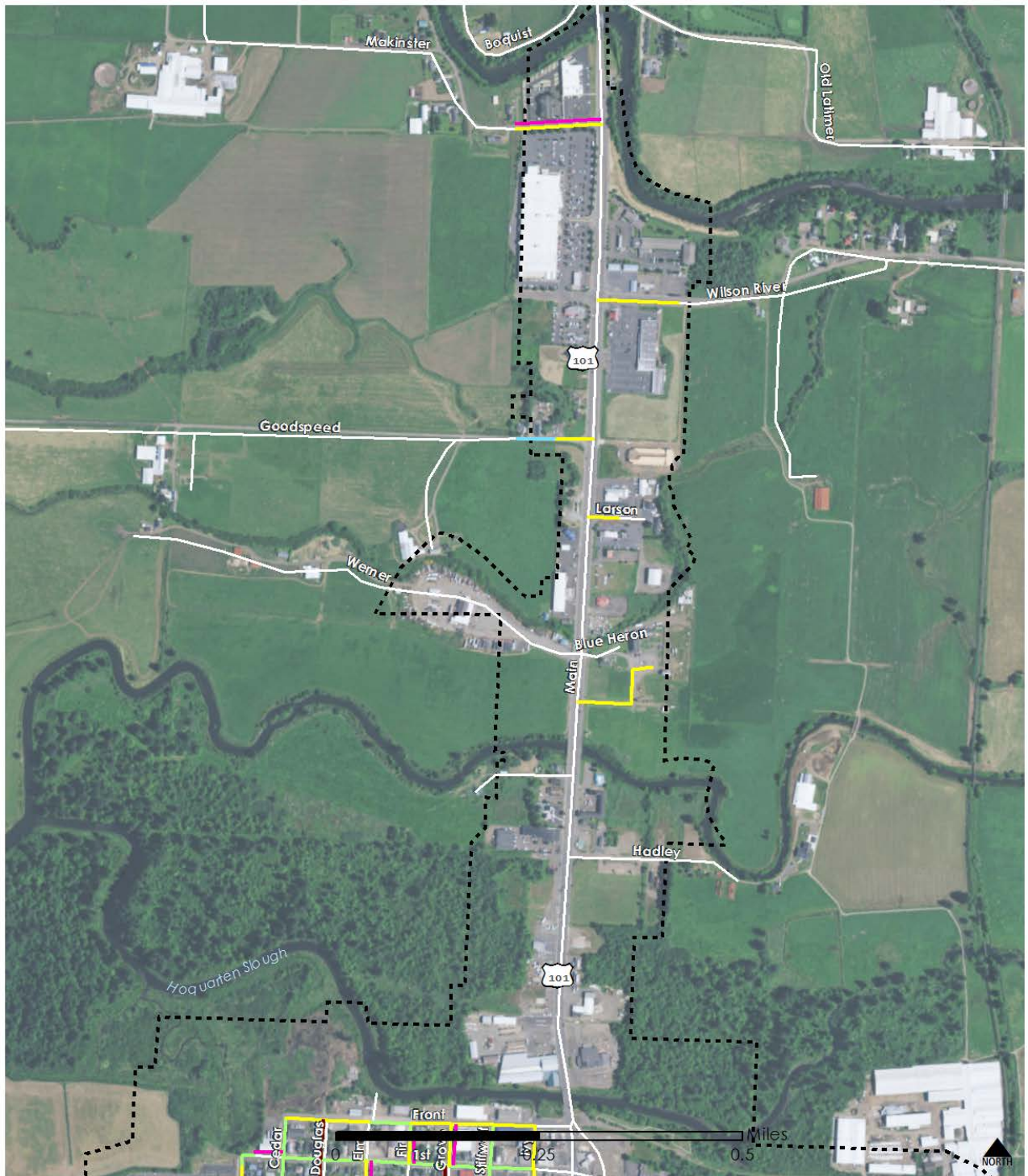


FIGURE 10. LOCAL ROAD CONDITIONS - NORTH



Road Conditions



City of Tillamook, Oregon
Transportation System Plan

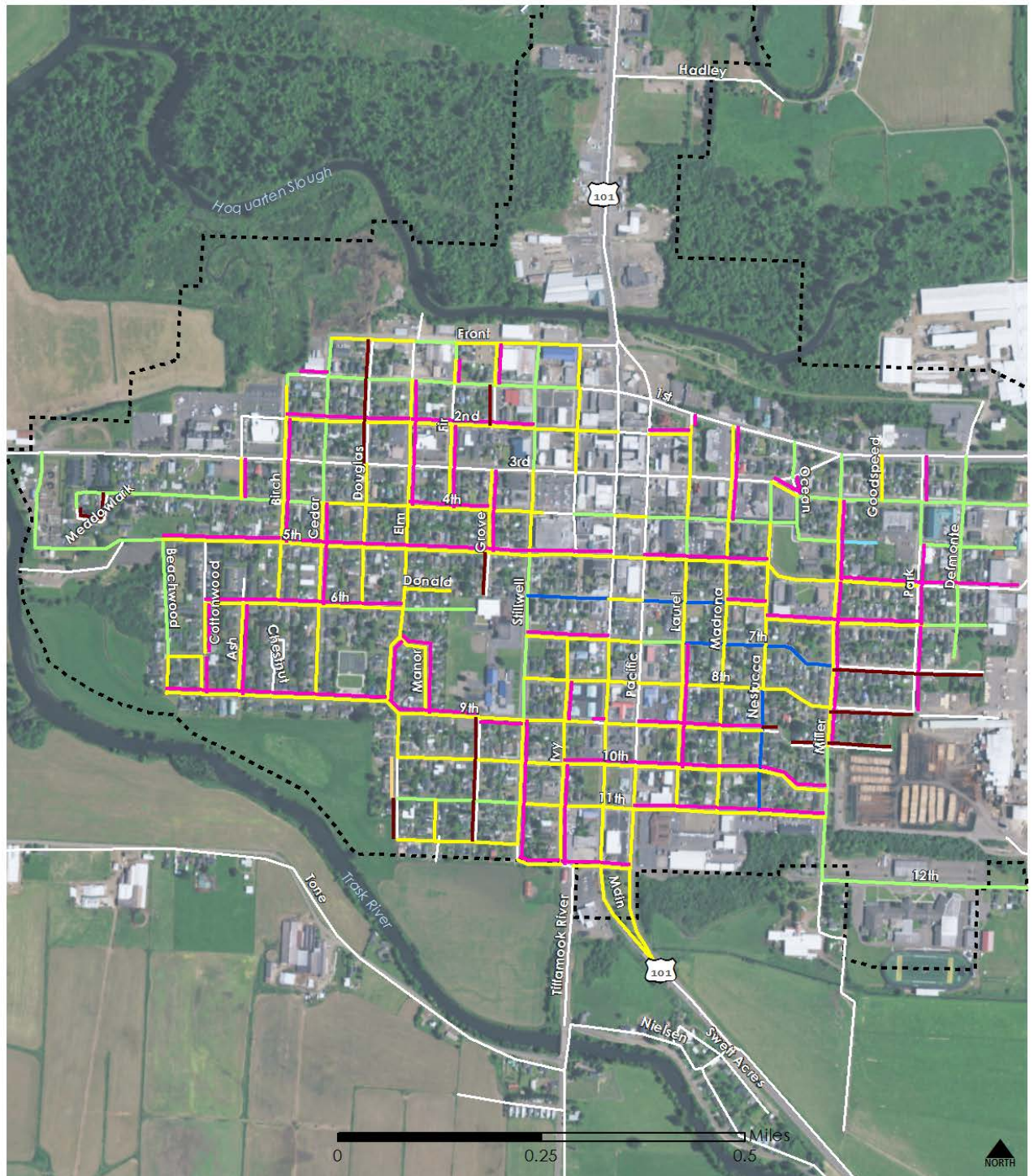
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- Complete Rebuild within 5 yrs
- Overlay within 5 yrs
- Grinding/Paving within 5 yrs
- Chip Seal within 5 yrs
- Concrete Street Needs Patching
- Pothole Patching to Maintain
- Nothing Needed
- City of Tillamook

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FIGURE 11. LOCAL ROAD CONDITIONS-- CENTRAL



Road Conditions



City of Tillamook, Oregon
Transportation System Plan

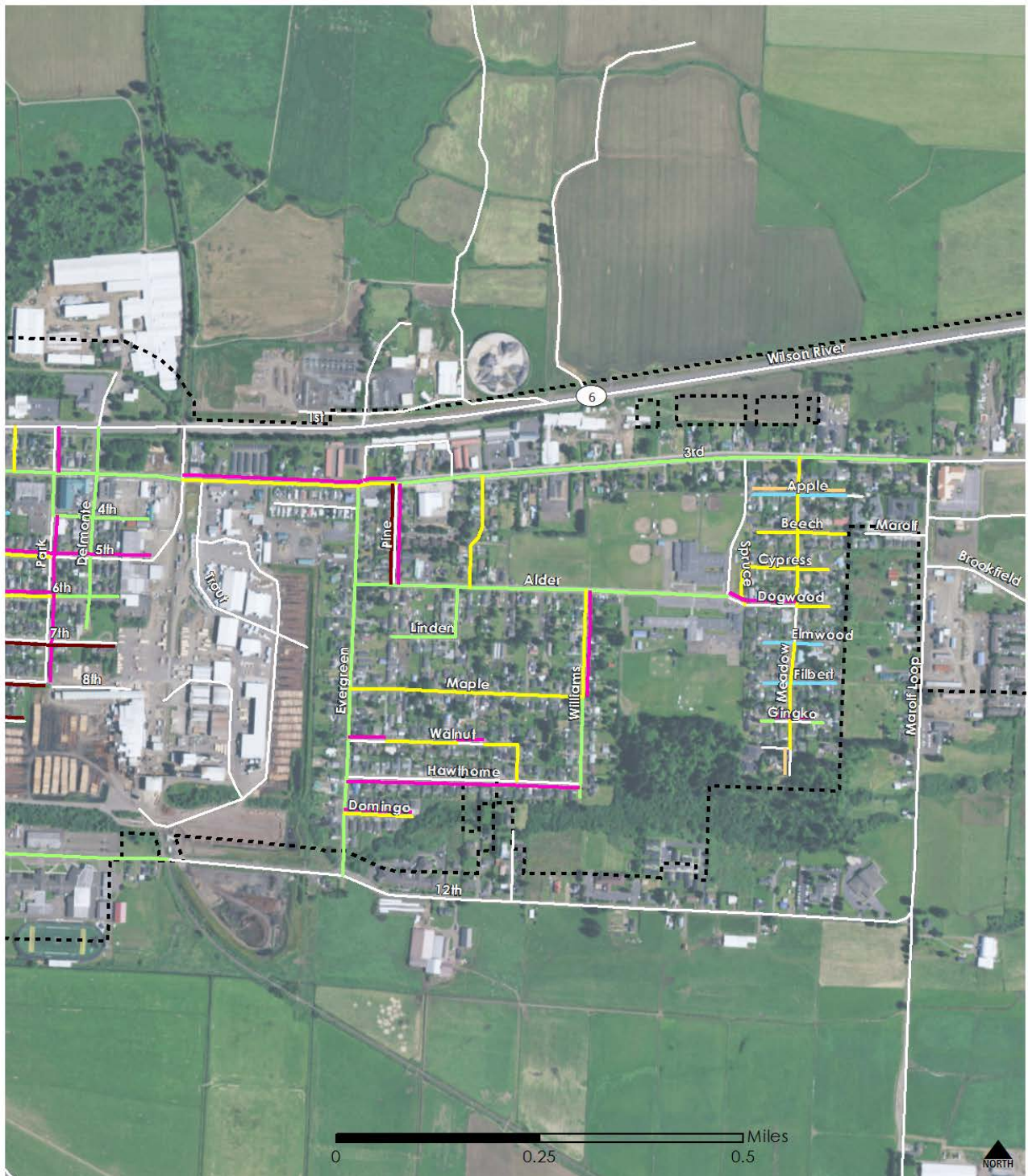
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- | | | |
|-------------------------------|--------------------------------|-------------------|
| Complete Rebuild within 5 yrs | Chip Seal within 5 yrs | Nothing Needed |
| Overlay within 5 yrs | Concrete Street Needs Patching | City of Tillamook |
| Gridding/Paving within 5 yrs | Pothole Patching to Maintain | |

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FIGURE 12. LOCAL ROAD CONDITIONS—EAST



Road Conditions



Legend

- Complete Rebuild within 5 yrs
- Chip Seal within 5 yrs
- Nothing Needed
- Overlay within 5 yrs
- Concrete Street Needs Patching
- City of Tillamook
- Grading/Paving within 5 yrs
- Pothole Patching to Maintain

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Intelligent Transportation Systems Infrastructure

A map of the regional Intelligent Transportation Systems (ITS) facilities¹¹ in the Tillamook area is presented in Figure 13. There are four nearby Highway Advisory Radio (HAR) signs posted on the US-101 to the north and south, and on OR-6 to the east. There is a HAR transmitter in Tillamook near the Junior High School. Additionally, there is a weather warning system sign on OR-6 about four miles east of downtown. Although the majority of these systems are not located within the Tillamook UGB, they are important to note for regional planning purposes.

Pedestrian Network

The pedestrian network is a critically important part of Tillamook's transportation system, as virtually all trips begin as pedestrian trips. Tillamook's pedestrian network primarily consists of sidewalks, roadway shoulder paths, marked crossings, and curb ramps. The recently constructed Hoquarton Interpretive Trail is the only off-street trail owned by the City of Tillamook.

Sidewalks

Tillamook's arterial and collector sidewalk network is generally well-developed in the core of the City (Figure 14). Sidewalks are generally 4-5' wide and many feature pedestrian curb ramps (ADA-compliance varies). Sidewalk coverage is generally comprehensive in the downtown area surrounding the US-101 couplet and curb ramps will be updated in many locations along the US-101 couplet as part of the US-101 / OR-6 project, currently underway. The City's Urban Renewal Agency recently completed a 'College-to-Clinic' project that filled in all sidewalk gaps on OR-131 3rd Street from east of the Tillamook County Fairground site to the west of Tillamook Regional Medical Center, providing a continuous pedestrian travel route and exercise facility.

Schools also generate significant pedestrian demand. Sidewalks are sometimes lacking in these areas, such as on the south side of 9th Street, across from Liberty Elementary School and surrounding Tillamook High School. In some locations, a high number of driveways and private accesses create a barrier to continuous, connected pedestrian facilities.

Most local streets have sidewalks on both sides of the street, but the sidewalk system lacks connectivity in some areas, forcing pedestrians to walk along paved or gravel roadway shoulders. On roadways that experience low traffic volumes, roadway shoulders can be adequate for pedestrian travel.

As of this writing, there are construction plans as part of the Crosstown Connections project reduce sidewalks along US-101 (SB Main and NB Pacific Avenues) between OR-6 1st Street and 4th Street. In addition, sidewalks on both sides of OR-6 1st Street will be rebuilt and a new shared-use connection will be built between Hoquarton Interpretive Trail and Goodspeed Park. The City is also planning to file a request for two ODOT TripCheck cameras at the intersection of OR-6 1st Street and US-101 (SB Main and NB Pacific Avenues) at the conclusion of the Tillamook TSP update to inform travelers of traffic and flooding conditions.

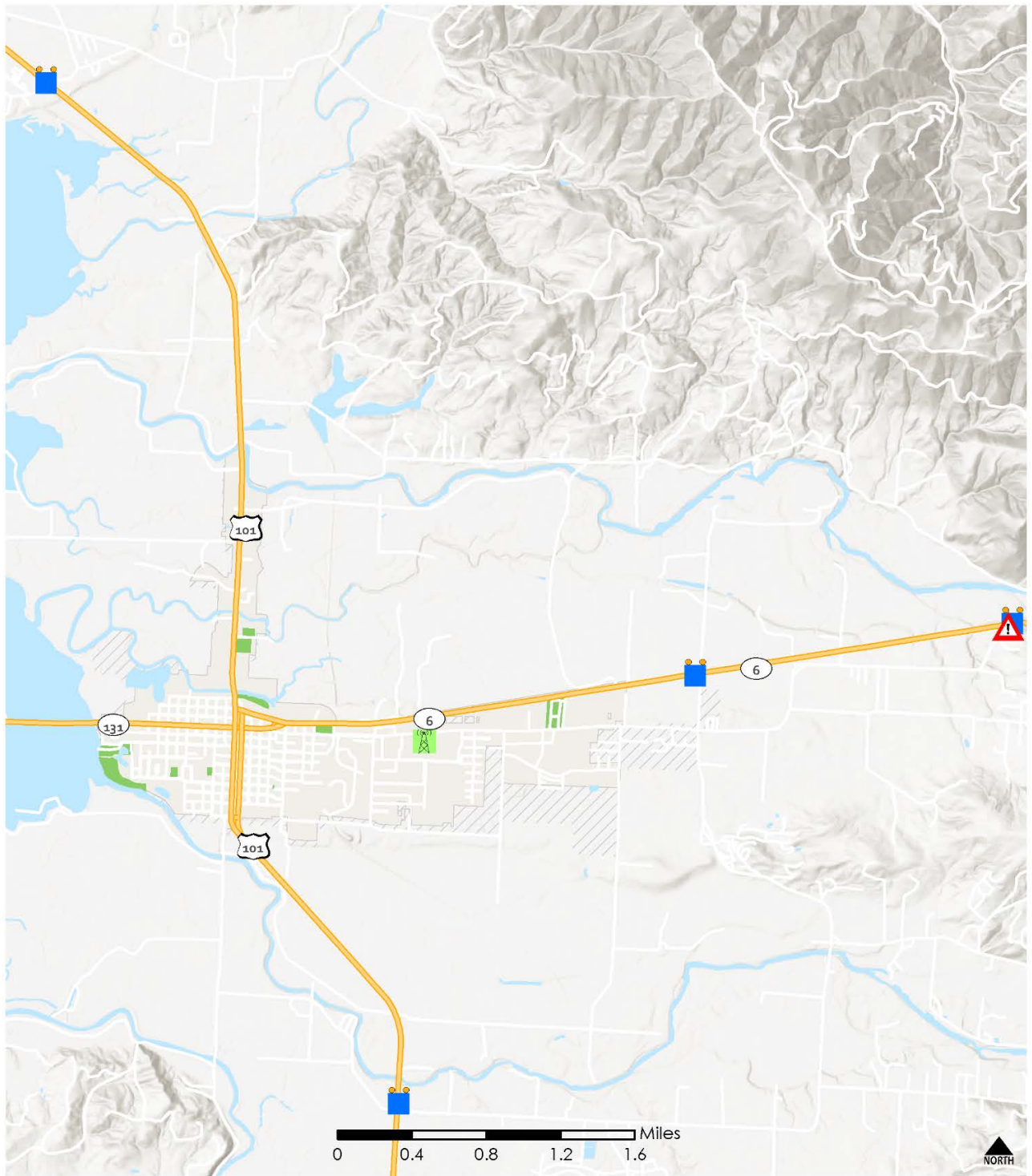
Americans with Disabilities Act (ADA) Facilities

Sidewalks in downtown Tillamook have generally been upgraded with curb ramps. Generally, ramps in front of newer development or commercial centers are ADA-compliant. However, some of the older ramps in downtown are not to ADA standard due to being too steep or cracked. Many sidewalks do not

¹¹ ODOT. ODOT TransGIS. <http://gis.odot.state.or.us/TransGIS/>. 2017.

have ADA-compliant sidewalk ramps, although most sidewalks meet minimum ADA width and maximum slope standards. For more information about ADA facilities on state highways, please refer to the ODOT Americans with Disabilities Act Title 11 Transition Plan Update.¹²

FIGURE 13. INTELLIGENT TRANSPORTATION SYSTEMS



Intelligent Transportation Systems (ITS)



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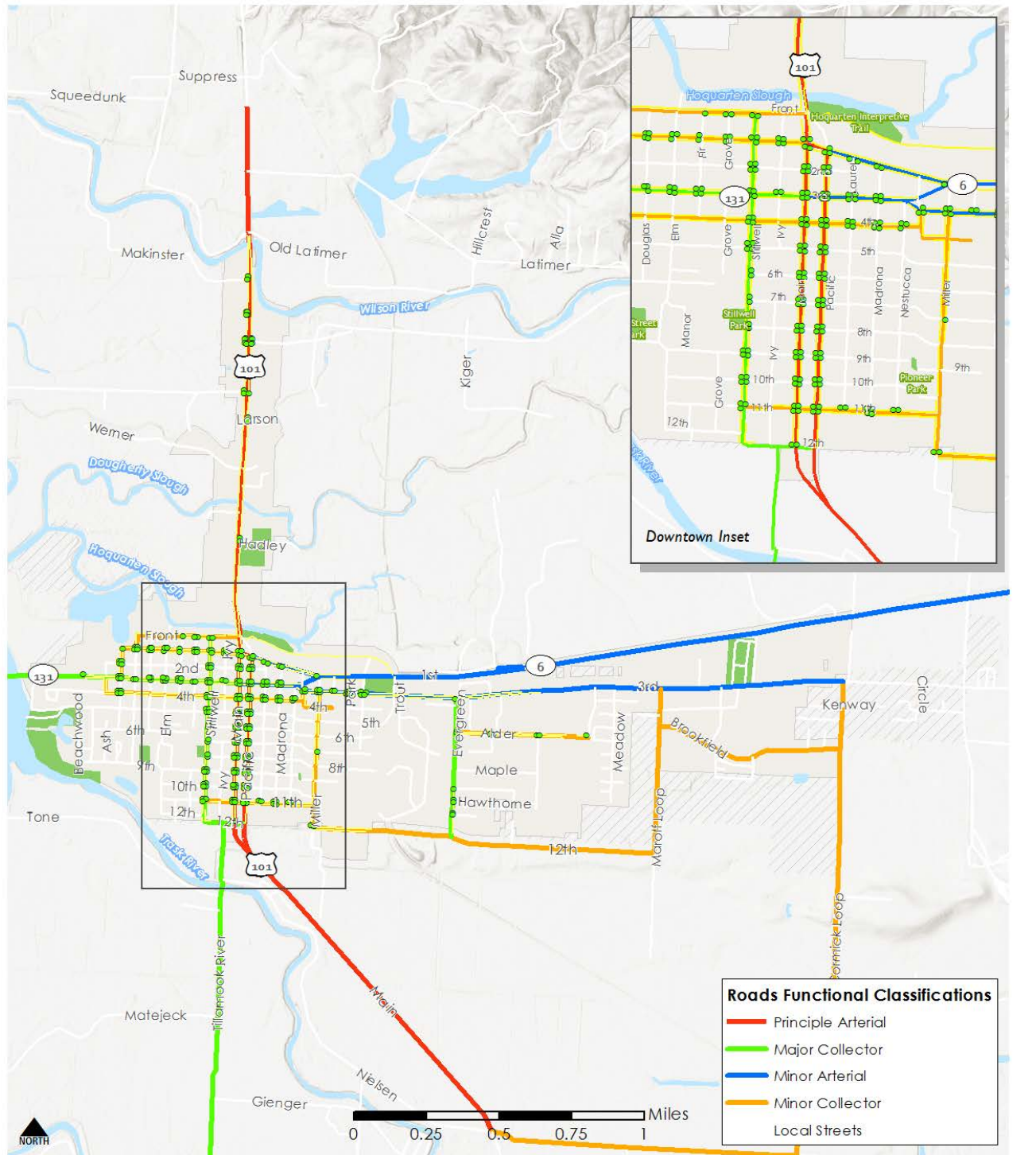
ITS Device

-  HAR Beacon Sign
-  HAR Transmitter
-  Weather Warning System

-  Waterbodies
-  Parks
-  City of Tillamook
-  Urban Growth Boundary

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FIGURE 14. TILLAMOOK ARTERIAL AND COLLECTOR PEDESTRIAN FACILITIES



Pedestrian Facilities Sidewalks and Curb Ramps



City of Tillamook, Oregon
Transportation System Plan

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Crosswalks

Numerous marked crosswalks are located throughout the City. Most of the marked crosswalks are near the downtown core along US-101 Main and Pacific Avenues. Marked crosswalks are located near pedestrian generators, such as schools, the YMCA facility on Stillwell Avenue, and Tillamook Regional Medical Center. The condition of the markings varies from location to location, and most intersections with marked crosswalks are striped on all approaches. The City's current crosswalk policy is to apply continental hash markings at any intersection where new paint or reapplication is needed. The presence of traffic signals at these intersections varies from location to location.

Curb "bulbouts" that shorten the pedestrian crossing distance are only present on US-101. More bulbouts are planned in many off-highway downtown locations in the Hoquarton Waterfront Plan.¹³

Trails and multi-use paths

The Hoquarton Interpretive Trail is the only multi-use trail owned by the City, located along the banks of the Hoquarton Slough in downtown Tillamook, just south of the bridge at 1st Street and US-101. The park was developed in a cooperative effort between the City and the Tillamook Estuaries Partnership, with support from the National Park Service's Rivers, Trails, and Conservation Assistance Program, and other community partners. The interpretive trail features a parking area, scenic viewpoints, and a bike and pedestrian-friendly trail system.



View from the Hoquarton Interpretive Trail
Source: City of Tillamook (2017)

Tillamook School District #9 owns and maintains the Bud Gienger Community Fitness Trail, which connects to the City's sidewalk system and follows the entire perimeter of the Tillamook Junior High School property. The trail features an eight-foot wide paved path as well as lighting and fitness stations located along the trail.

As of the writing of this plan, there are construction plans to build a new shared-use path between Hoquarton Interpretive Trail and Goodspeed Park. Construction will occur as part of the Crosstown Connections Project.

Bicycle Network

Tillamook has a designated bike route network shown in Figure 15. Some of these routes have existing bicycle facilities; however, much of the designated network consists of local low-traffic streets where separated bicycle facilities may not be warranted.

Bicycle facilities in Tillamook are either shoulder bike lanes or shoulder bikeways (with no striping) on US-101 and OR-6. There are no dedicated bicycle facilities on Tillamook local roads and bicyclists are required to share the roadway with vehicle traffic and pedestrians. Several City streets, described below, have striped shoulders that may be used by cyclists, but are not designated formally as bikeways. They do not include bicycle markings or signage.

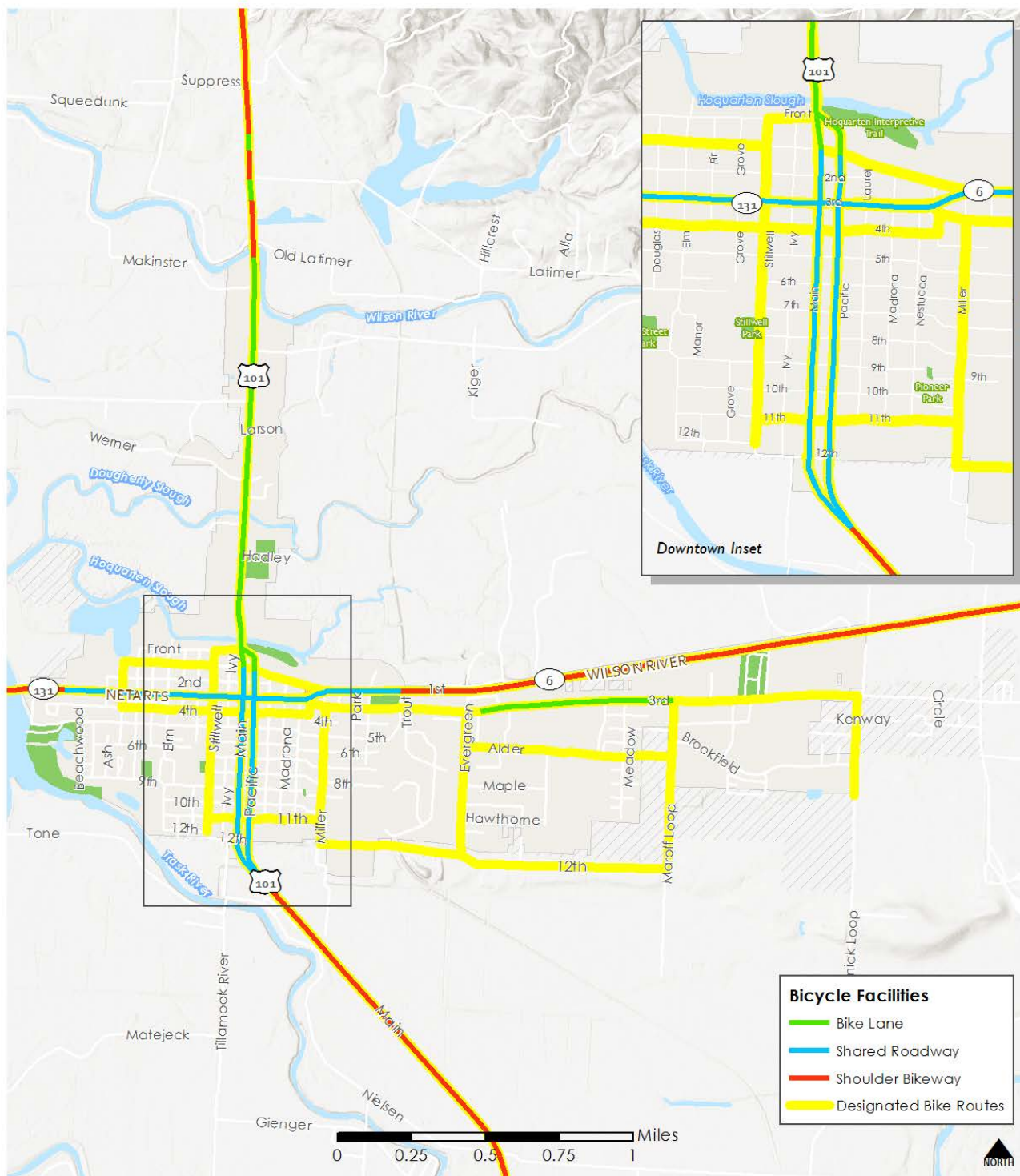
The majority of Tillamook's bicycle network consists of unstriped shared roadways on US-101 and OR-6/OR-131, which comprise a portion of the Oregon Coast Bike Route, linking Tillamook to the communities of Garibaldi and Bay City to the north to Sandlake and Pacific City to the south (Figure 15). On-street parking is allowed in downtown Tillamook, which effectively limits the travel space for bicyclists. Within the City, signage is limited on US-101 and OR-6.

Shoulder widths vary along US-101. US-101 SB (Main Avenue) has a shoulder width of 3 feet or greater, while US-101 NB (Pacific Avenue) has a shoulder width of less than 3 feet. Substandard unmarked and unsigned roadways also accommodate bicyclists as shoulder bikeways, but the City recognizes that any official components of the Tillamook bicycle system should be signed and/or marked as bicycle routes per 1995 Oregon Bicycle and Pedestrian Plan standards.

Per City street standards, shoulder bike lanes are 6-foot striped shoulders with signage and/or markings. Shoulder bike lanes are located on US-101 from 1st Street to the northern City limits, and along 3rd Street from Pine Avenue to Marolf Loop Road. The bike lanes along US-101 provide a dedicated bicycle connection from Hoquarton Interpretive Park and Hadley Fields to the Fred Meyer just south of the Wilson River. The 3rd Street bike lane provides bicycle connections to the Tillamook County Transit District headquarters near Linden Drive and to Tillamook Bay Community College. There are two short bike lane segments located north of the City approaching the Tillamook Cheese Factory.

New bike routes are planned as part of the Hoquarton Waterfront Plan and the US-101 / OR-6 Traffic Improvement Project. The Crosstown Connections Project plans to develop a future connection to the Salmonberry Rails to Trails project along the southern perimeter of the Hoquarton Waterfront Plan's Hoquarton City Park. The Salmonberry Trail is an 88-mile rail corridor that will provide an off-street bicycle and pedestrian connection through Oregon's Coast Range. The Salmonberry Trail also has the potential to provide a new bicycle/pedestrian connection from the Tillamook Creamery to the Downtown Tillamook. As of this writing, the City's only off-street bicycle facility is the Hoquarton Interpretive Trail.

FIGURE 15. TILLAMOOK BICYCLE NETWORK



Existing Bicycle Facilities and Designated Bicycle Routes



City of Tillamook, Oregon
Transportation System Plan

Legend

- Highways
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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Public Transportation System

Tillamook County Transportation District (TCTD, or “the Wave”) provides public transportation services to the City of Tillamook, including fixed-route bus, paratransit (dial-a-ride) services, and intercity service to regional connections as far north as Cannon Beach, south to Lincoln City, west to Pacific City and Oceanside, and east to Portland. TCTD is a member of the Northwest Oregon Transit Alliance – a coordinated regional transit system called the Northwest Connector comprised of five county transit providers across northwest Oregon. All six Wave routes provide complementary paratransit service.

TABLE 4. TCTD BUS ROUTES

Route Number	Route Name	Service	Frequency
1	Tillamook Town Loop	Local fixed-route	<ul style="list-style-type: none"> All day, 7-days a week 1-hour headways First bus at 7:15am; last bus at 7:10pm
2	Tillamook – Oceanside – Netarts	Limited local; intercity service	<ul style="list-style-type: none"> All day, 7-days a week Eastbound: First bus at 6:50am; last bus at 7:00pm Westbound: First bus at 6:25am; last bus at 6:35pm
3	Tillamook – Manzanita – Cannon Beach	Limited local; intercity service	<ul style="list-style-type: none"> All day to Manzanita, twice a day to Cannon Beach, 7-days a week Approximately 2-3 hour headways Northbound: First bus at 5:38am; last bus at 7:11pm Southbound: First bus at 6:44am; last bus at 8:12pm
4	Tillamook – Lincoln City	Intercity service	<ul style="list-style-type: none"> Four times a day, 7-days a week Approximately 4-hour headways Northbound: First bus at 4:58am; last bus at 7:31pm Southbound: First bus at 6:34am; last bus at 9:17pm
5	Tillamook – Portland	Intercity service	<ul style="list-style-type: none"> Twice a day, 7-days a week 4-5 hour headways Eastbound: First bus at 8:10pm; last bus at 3:10pm Westbound: First bus at 11:05am; last bus at 3:30pm
6	Coastal Connector	Intercity service	<ul style="list-style-type: none"> Three times a day, 7-days a week 5-6 hour headways First bus to Spirit Mountain at 7:35am; to Chinook Winds at 8:35am; to Salem at 8:00am; to Lincoln City at 9:40am Last bus to Spirit Mountain at 5:15pm; to Chinook Winds at 6:15pm; to Salem at 7:40pm; to Lincoln City at 9:20pm

Source: Northwest Oregon Connector Alliance (2017)

Service Characteristics

Fixed Route Bus

The Wave provides seven-day-a-week fixed route service on all its regular routes. The Wave operates deviated fixed route service on Routes 1, 2, 3, and 4, which means buses can deviate up to $\frac{3}{4}$ mile from their set route to accommodate passenger demand, as long as their schedules permit. Deviation requests are limited when Dial-A-Ride services are available (see Paratransit section below). TCTD buses have a minimum two-bike capacity and are ADA-accessible. TCTD does not provide service on major holidays.

The Tillamook Town Loop is the City of Tillamook's local public transportation route. The loop originates and ends at the Tillamook Transit Center in downtown Tillamook. There are 15 total stops along the route. Community destinations along the route include Tillamook High School, the Tillamook Department of Human Services (DHS) Office, Goodspeed Park, the Tillamook Cheese Factory, the Tillamook County Library, and the Tillamook Regional Medical Center (Figure 16). Intercity Wave routes offer limited service to local stops as well (Table 4).

The Wave also operates a data program to allow passengers access to real-time bus arrival information via mobile phone or desktop computer. All Wave buses are equipped with trackers, and the data is made available via SMS text messaging, the Swiftly mobile app, and the Swiftly website:

<http://schedules.goswift.ly/tillamook-schedule/>

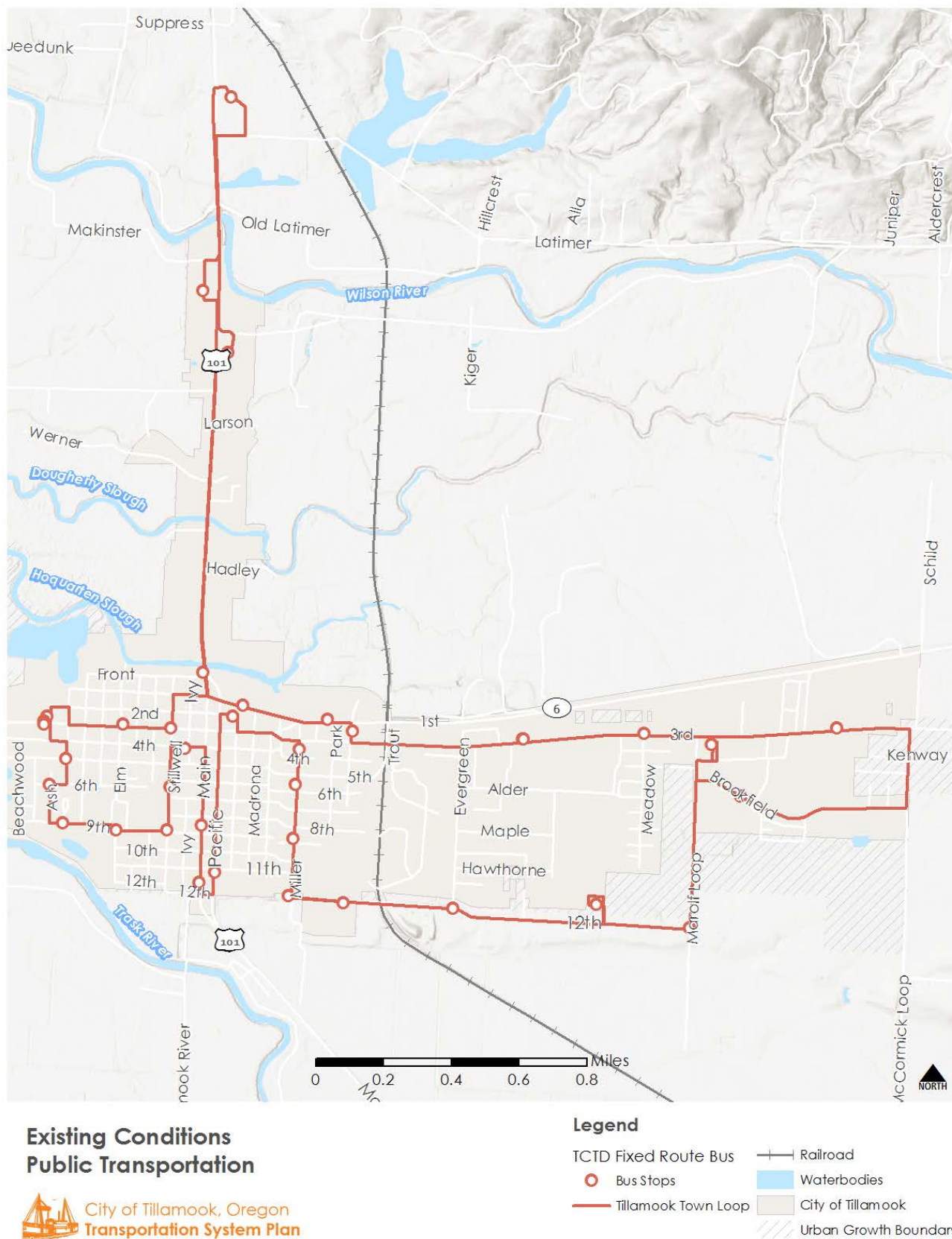
The Wave charges \$1.50 for an all-day ticket to ride Tillamook Town Loop. Tillamook Town Loop runs hourly. Monthly regular and discounted passes are available for \$40 and \$30.

Paratransit

The Wave provides door-to-door Dial-A-Ride services Monday through Friday, from 8:00 am to 5:00 pm. TCTD is responsible for providing these services in the Central Tillamook County, and relies on volunteers to deliver paratransit services in the North and South County. Customers can request a ride up to two weeks in advance anytime within the Dial-A-Ride service window, excluding holidays. Rides are available on a first-come, first-serve basis. Central county paratransit trips are operated on the standard Wave bus fleet. North and south county paratransit trips are provided via volunteer-driven ADA compliant, wheelchair accessible, low-floored mini-vans.

Each one-way ride costs \$3 full fare and \$1.50 discounted for seniors over 60 and disabled riders. Personal care attendants may travel free of charge but must notify the dispatcher during the reservation process to ensure on-board space availability.

FIGURE 16. TCTD “THE WAVE” FIXED BUS SERVICE; ROUTE 1: TILLAMOOK TOWN LOOP



Intercity Bus

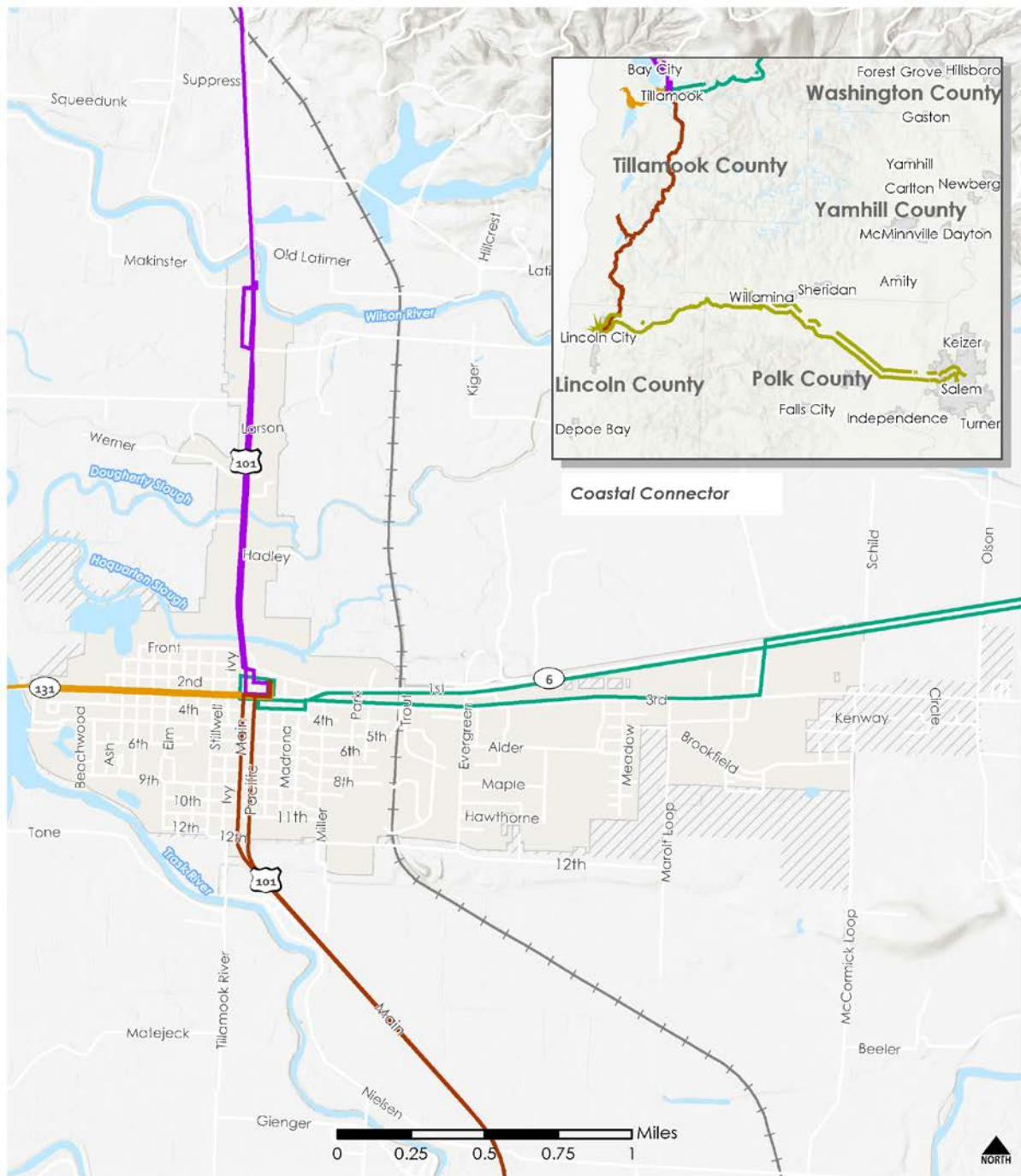
As a member of the Northwest Connector, five of the Wave's six routes provide intercity bus service to neighboring communities (Figure 17. TCTD "The Wave" Intercity Bus Service):

- Route 2 connects to the coastal communities of Netarts, Oceanside, and the Three Arch Rocks Wilderness Area. Route 2 also provides limited service to downtown, and includes stops at Tillamook County Pioneer Museum and Tillamook Regional Medical Center.
- Route 3 provides all-day intercity bus service between Tillamook and Manzanita, including two daily runs to Cannon Beach. Route 3 also provides limited downtown service to Tillamook County Pioneer Museum and stops at the Fred Meyer off US-101 and Wilson River Loop.
- Route 4 runs four times every day between Tillamook and Lincoln City, and includes stops in Neskowin and Pacific City. Route 4 provides local bus connections via the US-101 couplet from downtown to the southern extent of the City, and includes a stop at Pelican Pub and Brewery.
- Route 5 daily intercity service connects Tillamook residents to Portland, where riders can access additional service via Amtrak, Greyhound, TriMet, and the Portland International Airport (PDX).

The Wave's participation in the Northwest Connector allows the District to offer regular connecting service to Salem and stops along the way. Route 6 Coastal Connector service connects Chinook Winds in Lincoln City to Salem via OR 22, and includes stops at Spirit Mountain in Grand Ronde, Baskett Slough Wildlife Refuge, Salem Riverfront Park, and the Amtrak-Greyhound Station near Willamette University in downtown Salem.

Wave intercity fares are zone-based and range from \$1.50 to \$4.50 depending on the route. The Wave also offers 3-day and 7-day visitor passes for any route served by Northwest Connector for \$25 and \$30, respectively.

FIGURE 17. TCTD “THE WAVE” INTERCITY BUS SERVICE



Existing Conditions Public Transportation



Legend

- Coastal Connector
- Tillamook - Manzanita/Cannon Beach
- Tillamook - Oceanside/Neararts
- Tillamook - Portland
- Tillamook-Lincoln City
- Railroad
- Waterbodies
- City of Tillamook
- Urban Growth Boundary

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Service Gaps and Deficiencies

Tillamook's growth is expected to place a greater demand on the City's existing public transportation services. The TCTD Transit Development Plan (TDP) estimates that between 2010 and 2040, transit demand is expected to increase by at least 20 percent.

The size of the TCTD fleet is determined by the service needs. The financial forecast documented in the TDP has indicated that TCTD has a capacity to support up to three new buses. Currently, TCTD operates a fleet of 23 vehicles, comprised of five vehicle types. The TDP recommends that the fleet be standardized to two types of vehicles: medium-sized (approximately 30 to 32-foot) buses to provide fixed-route service, and mini-vans or small buses for paratransit services. Additional recommendations for the fleet include purchasing heavy-duty buses for fixed-route service, purchasing vehicles in larger batches, maintaining an average fleet age that is less than half of the average life span of the vehicles, and continuing to purchase low-floor buses, with the goal of eventually replacing all of the currently operating high-floor buses with low-floor models as part of the normal bus replacement schedule.

TABLE 5. CURRENT FLEET INVENTORY

Vehicle Type	Fuel	Capacity (Seats)	Useful Life	Count
B: Medium-Size, Heavy-Duty Transit Bus	Diesel	28-33	10yr/350,000 mile	9
C: Medium-Size, Medium Duty Bus & Van Chassis Cutaway Bus	Gas	14-18	7yr/250,000 mil	1
D: Medium-Size, Light-Duty Bus & Van Chassis Cutaway Bus	Diesel	14-18	5yr/150,000 mile	4
E1: Small, Light-duty Bus	Gas	9	4yr/100,000 mile	2
E3: Modified Minivans	Gas	5-6	4yr/100,000 mile	7
B: Medium-Size, Heavy-Duty Transit Bus	Diesel	28-33	10yr/350,000 mile	9
TOTAL		70 – 84		23

Source: Tillamook Transit Development Plan (2016)

Based on the useful life of the fleet and the date of purchase, approximately 18 of TCTD's 23 vehicles will need to be replaced by 2020, which equates to a total cost of \$2,240,000. It is anticipated that 75 percent of these new buses will be funded through Section 5339 and the remainder through local match. Given the need to replace buses, the TDP recommends that TCTD develops a long-range fleet financing plan. The plan would include both a replacement schedule of existing buses as they reach the end of their useful life, as well as possible fleet expansion to accommodate service growth.

Table 5 summarizes high-level public transportation service gaps and deficiencies as described in the TDP.

TABLE 6. TCTD PUBLIC TRANSPORTATION SYSTEM GAPS AND DEFICIENCIES

Route Number	Route Name	Deficiency Type	Description
N/A	N/A	Service Coverage	Consider expanding Routes 3 and 4 to include popular deviated fixed route destinations
N/A	N/A	Service Coverage	Add more stops in Tillamook, Nehalem, and Manzanita
N/A	N/A	Service Coverage	Add new service to Mohler/Highway 53 and Neah Kanie
N/A	N/A	Service Coverage	Add or increase service to key community destinations, such as the Tillamook PO, YMCA, and VA Clinics
N/A	N/A	Service Frequency	Increase service frequency to heavily-trafficked areas on north-south routes
1	Tillamook Town Loop	Service Coverage	Expand local fixed route service within the City limits. Currently, Route 1 is the only city-specific route.
1	Tillamook Town Loop	Service Frequency	Provide earlier morning and later evening service
2	Tillamook – Oceanside – Netarts	Service Frequency	Increase frequency between PM peak travel period
3	Tillamook – Manzanita – Cannon Beach	Service Frequency	Increase mid-day service and extend evening hours
4	Tillamook – Lincoln City	Service Coverage	Provide fixed-route bus service to the Port of Tillamook Bay, Woods (Route 4)
4	Tillamook – Lincoln City	Service Frequency	Provide earlier service to shelters in Hebo, Cloverdale, and Beaver
5	Tillamook – Portland	Service Coverage	Provide connections to Beaverton and Hillsboro (Route 5)
6	Coastal Connector	Service Frequency	Extend service hours to Lincoln City, Salem, and Grande Ronde

Source: Tillamook Transit Development Plan (2016)

Rail

There is one rail facility in Tillamook, as shown in Figure 18. The southern terminus of the rail line is at the Port of Tillamook Bay industrial site, while the north terminus is in Enright. In Tillamook, the rail line proceeds in the north-south direction between Miller Avenue and Evergreen Drive.

The Port of Tillamook Bay, which owns and operates the line, filed for abandonment of the rail line with the Surface Transportation Board (STB) in May 2016. The Oregon Coast Scenic Railroad currently has operating rights, but does not operate any regular trains through Tillamook. However, they may periodically operate rail equipment through the area. Additionally, a severe storm in December 2007 badly damaged the rail line, rendering it inoperable as a freight line. Approval has been granted by the STB to establish interim trail use of the entire line. Future plans include replacing some rail sections with trails, and in other sections adding trails adjacent to the rail line¹⁴.

There is an overcrossing which carries the rail line over OR-6 just east of Del Monte Avenue. There are two at-grade crossings – one at 3rd Street and the other at 12th Street. At the 3rd Street crossing, flashing lights and an automatic gate warn vehicles of oncoming trains. The 12th Street crossing only has static railroad signs placed on both sides of the track. At OR-6, the rail line is grade-separated above the roadway, then continues north, east of Tillamook. The designated track speed is 10 miles per hour.

Truck Freight Routes

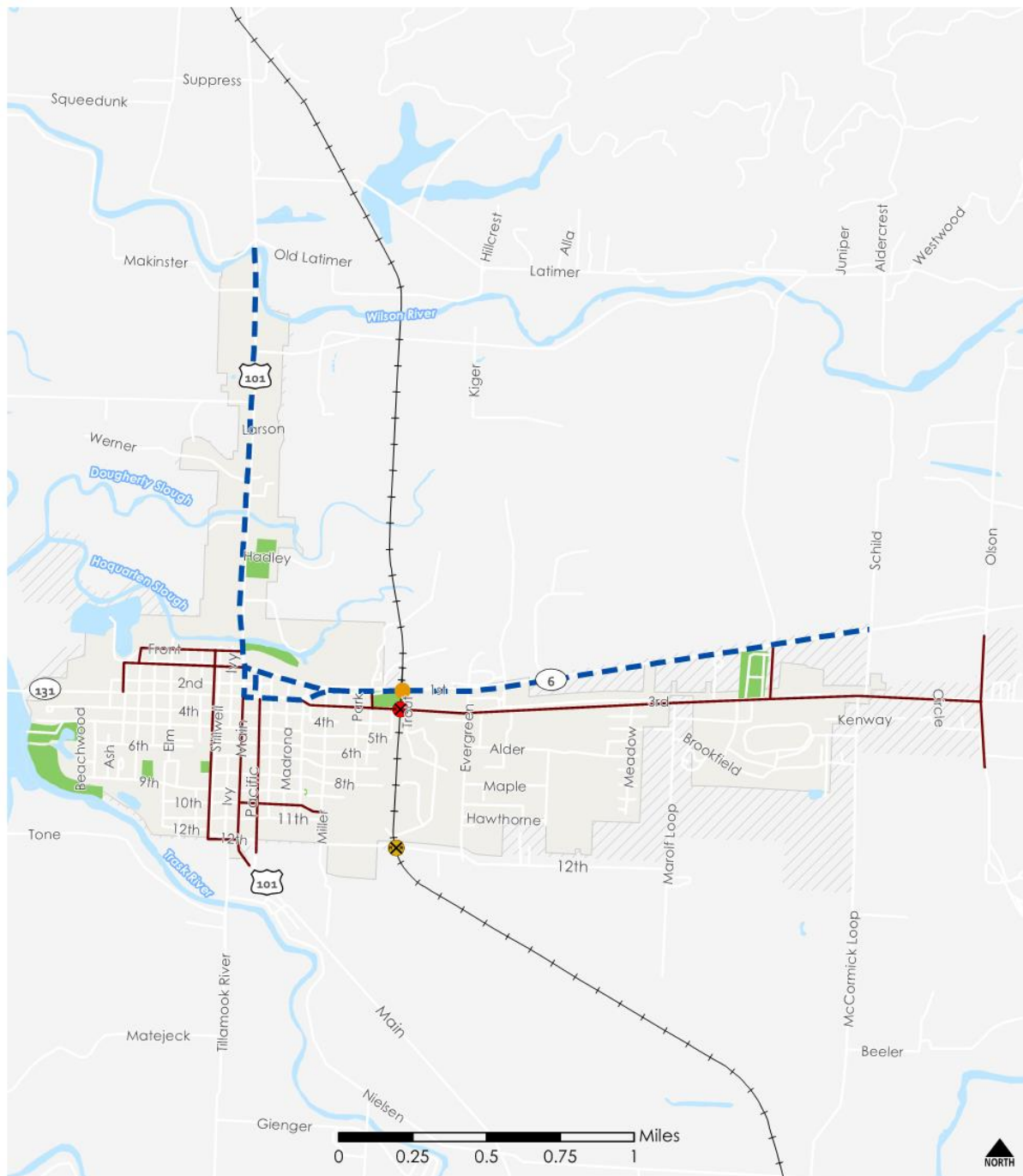
Tillamook has designated various roads in the city as truck routes in addition to the state freight routes designated in the OHP. The truck routes provide a connection between state facilities and major freight destinations in the city (TP Freight Lines, Tillamook Lumber Company, and industrial businesses on Front Street). U.S. 101 and OR-131 are not classified as freight routes in the OHP, but trucks use these state and regional facilities to access Tillamook. The following are the city's designated freight routes, which are shown on Figure 18:

- Wilson River Loop
- 3rd Street (including OR-131)
- Front Street
- Cedar Avenue (short segment)
- Birch Avenue (short segment)
- 1st Street
- Stillwell Avenue
- Latimer Road
- Trask River Road (south of OR-6)
- 10th Street
- 12th Street
- Del Monte Avenue (short segment)
- US-101 (Main and Pacific Avenues)

In addition to the City routes, the segments of US-101 and OR-6 that fall within the Tillamook UGB are classified as national network freight routes. ODOT has also classified these facilities as reduction review routes and OR-6 is classified as a state freight route. Reduction review routes require special review before any executing any projects that may limit the route's capacity.

¹⁴ Per email conversation with Richard Shankle and Robert Melbo at ODOT, Rail and Public Transit Division. October 2017.

FIGURE 18. FREIGHT AND RAIL FACILITIES



Freight and Rail Facilities



City of Tillamook, Oregon
Transportation System Plan

Legend

- | | | |
|---------------------|--|-----------------------|
| —+— Railroad | — State Freight Route* | Waterbodies |
| ● Gated Crossing | — City Freight Route | Parks |
| ● Signed Crossing | *Also designated as Reduction Review Route | City of Tillamook |
| ● Rail Overcrossing | | Urban Growth Boundary |

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The current truck routes lead to conflicts between trucks and pedestrians (that is, downtown Tillamook and Stillwell Avenue). It is preferred to separate trucks from other modes as much as possible. It is noted that even with a truck route, trucks still may need to use other roads to reach their destination. The intent of a truck route is to provide the most efficient route that minimizes the modal conflicts while providing adequate connections between the state and local systems.

Aviation

The Tillamook Airport, owned and operated by the Port of Tillamook Bay, is located south of Tillamook, outside the city limits adjacent to US-101. The airport provides services ranging from light passenger and cargo planes to modern military aircraft, as well as experimental aircraft and airships. Currently, Tillamook Airport provides no commercial air passenger service, but the airport is suitable for most private or commercial aircraft. The Portland International Airport, which is located approximately 75 miles east of Tillamook, is the closest commercial air passenger service provider.

Marine Transportation

There are no boat moorage facilities or navigable canals in Tillamook. There are two boat ramps, one for the Trask River (at Carnahan Park) and one for the Hoquarton Slough (at Sue H Elmore Park). Hoquarton Slough is an Army Corp of Engineers-designated navigable waterway.

The Tillamook County Water Trail includes approximately 200 miles of navigable waterways in Tillamook County, in and around the City of Tillamook. The Water Trail is designated as a National Recreation Trail; the Tillamook County Water Trail Committee produces brochures and maps to support use of the system.

Pipelines

Based on a review of readily available public information, there are no known substantial pipelines in Tillamook. The City does not currently have natural gas service.

Traffic Analysis

Traffic Volumes

An analysis of existing operating conditions (2017) was conducted for 20 intersections in Tillamook located on state, county, and city facilities. The study intersections were selected for analysis based on input from city and ODOT staff. The analysis was conducted using turn movement counts conducted in 2017 and automated traffic recorder (ATR) data.

The TSP guidelines adopted by ODOT require that volume-to-capacity (v/c) ratios for intersections be calculated using 30th-highest-hour traffic volumes (30 HV). In urban areas, 30 HV typically occur during a weekday peak hour. In recreational areas such as the Oregon coast, 30 HV typically occur during the peak tourist season. Therefore, 30 HV in Tillamook occur during summer months (July and August) during the peak tourist season. Since counts were collected outside of the peak month, seasonal factors were applied when developing the existing year volumes. The traffic volumes were increased by approximately five to ten percent (depending on when counts were collected) to account for seasonal variation. More details on this process are documented in ODOT's Analysis Procedures Manual (APM)¹⁵ and the appendix.

¹⁵ Oregon Department of Transportation. Analysis Procedures Manual. 2006.

Motor vehicle volumes on the roadways in Tillamook peak during the evening between 4:20 p.m. and 5:20 p.m. along the highway routes, and between 4:50 p.m. and 5:50 p.m. along local routes. These two system peak hours reflect a general PM peak hour that was analyzed for the existing 30 HV conditions. US-101 has the highest traffic volumes in Tillamook. During the PM peak hour, the heavier direction of travel on US-101 in the downtown area is southbound (along Main Avenue). East-west routes with major volume include OR-6, 3rd Street, and OR-131.

Operational Criteria

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and v/c ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Volume-to-Capacity (V/C) Ratio

A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection is operating. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When it is closer to 0, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays and developing queues.

Level of Service (LOS)

Level of service is also a widely recognized and accepted measure and descriptor of traffic operations. At both stop-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a STOP-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly, at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

Mobility Standards

Thirteen of the 20 study intersections are under the jurisdiction of ODOT, and will use the mobility standards defined in the OHP¹⁶. The intersections on US-101 and OR-131 are within the Tillamook UGB, which is not a part of a Metropolitan Planning Organization (MPO). US-101 is defined as a statewide highway that is a non-freight route. The v/c ratio for this route varies between 0.8 and 0.9, based on the posted speed. From 1st Street to the southern city limits US-101 is also designated as an STA, which has a different v/c ratio standard of 0.95. OR-131 is classified as a district non-freight route and has a mobility

¹⁶ Oregon Department of Transportation. 1999 Oregon Highway Plan, Table 6. 1999

standard of 0.95. There are two intersections along OR-6 are outside of the UGB and OR-6 is classified as a regional freight route, so these intersections have a mobility standard of a 0.75 v/c ratio.

In Tillamook, there are several unsignalized intersections along US-101, OR-6, and OR-131. The OHP designates a maximum v/c ratio of 0.85 for local road approaches in the UGB (non-MPO areas, speed limit less than 45 mph) and a maximum v/c ratio of 0.80 for local road approaches outside the UGB. For intersections under City and County jurisdiction no mobility standards are specified. In these instances, a v/c ratio of 0.85 is used as the mobility standard. The list of study intersections with their associated jurisdictions and mobility standards are recorded in Table 7. Mobility Standards

TABLE 7. MOBILITY STANDARDS

No.	Intersection Name	Control	Jurisdiction	Mobility Standard (V/C Ratio)	
				Signalized/ Major Approach	Minor Approach
1	US-101/Wilson River Loop	Signalized	ODOT	0.80	-
2	US-101 SB (Main Ave)/Front St	Two-way stop	ODOT	0.90	0.85
3	US-101 SB (Main Ave)/OR-6 WB (1st St)	Signalized	ODOT	0.95	-
4	US-101 NB (Pacific Ave)/OR-6 WB (1st St)	Signalized	ODOT	0.95	-
5	US-101 SB (Main Ave)/OR-6 EB (3rd St)	Signalized	ODOT	0.95	-
6	US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	Signalized	ODOT	0.95	-
7	US-101 SB (Main Ave)/4th St	Signalized	ODOT	0.95	-
8	US-101 NB (Pacific Ave)/4th St	Signalized	ODOT	0.95	-
9	US-101 SB (Main Ave)/11th St	Two-way stop	ODOT	0.95	0.85
10	US-101 NB (Pacific Ave)/11th St	Two-way stop	ODOT	0.95	0.85
11	Wilson River Loop North/OR-6	Two-way stop	ODOT	0.75	0.80
12	Wilson River Loop South/OR-6	Two-way stop	ODOT	0.75	0.80
13	Stillwell Ave/OR-131 (3rd St)	All-way stop	ODOT	0.95	0.85
14	Marolf Loop Rd/3rd St	Two-way stop	County	0.85	0.85
15	Evergreen Dr/12th St	Two-way stop	County	0.85	0.85
16	Evergreen Dr/Alder Ln	Two-way stop	City	0.85	0.85
17	Evergreen Dr/3rd St	Two-way stop	County	0.85	0.85
18	Miller Ave/11th St	Two-way stop	City	0.85	0.85
19	Miller Ave/3rd St	Two-way stop	City	0.85	0.85
20	Stillwell Ave/9th St	Two-way stop	City	0.85	0.85

Level of Service (LOS)

Existing (2017) PM peak hour traffic operations were evaluated at the 20 study area intersections. These operating conditions account for the completion of the current improvements on US 101 and Oregon 6, which include some modifications to turn lane configurations and allowed movements from prior conditions in the downtown core. Operations are described in the following section and the detailed analysis worksheets are presented in the Appendix. All operations for unsignalized intersections were evaluated using the methodology outlined in the 2010 Highway Capacity Manual (HCM). Operations for signalized intersections were evaluated using methodology outlined in the 2000 HCM.

Table 8 reports the operational results for each signalized intersection and the results for the critical movement at the both the major and minor approaches for each unsignalized intersection. Critical movements at unsignalized intersections are typically the minor-street left turns or, in the case of single-lane approaches, the minor street approaches. These movements are required to yield to all other movements at the intersection and thus are subject to the longest delays and have the least capacity. Left turns from the major street are also subject to delays, since motorists making these maneuvers must also yield to oncoming major-street traffic.

TABLE 8. EXISTING PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS (WITH COMPLETION OF US 101 AND OR 6 IMPROVEMENTS)

No.	Intersection Name	Control	LOS	V/C Ratio
1	US-101/Wilson River Loop	Signalized	B	0.52
2	US-101 SB (Main Ave)/Front St ¹	Two-way stop	B	0.02
3	US-101 SB (Main Ave)/OR-6 WB (1st St)	Signalized	C	0.51
4	US-101 NB (Pacific Ave)/OR-6 WB (1st St)	Signalized	C	0.44
5	US-101 SB (Main Ave)/OR-6 EB (3rd St)	Signalized	B	0.47
6	US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	Signalized	B	0.43
7	US-101 SB (Main Ave)/4th St	Signalized	B	0.35
8	US-101 NB (Pacific Ave)/4th St	Signalized	B	0.38
9	US-101 SB (Main Ave)/11th St ¹	Two-way stop	C	0.26
10	US-101 NB (Pacific Ave)/11th St ¹	Two-way stop	C	0.26
11	Wilson River Loop North/OR-6	Two-way stop	A/B	0.08/0.30
12	Wilson River Loop South/OR-6	Two-way stop	A/B	0.05/0.16
13	Stillwell Ave/OR-131 (3rd St)	All-way stop	C/B	0.68/0.32
14	Marolf Loop Rd/3rd St	Two-way stop	A/C	0.04/0.34
15	Evergreen Dr/12th St	Two-way stop	A/B	0.09/0.20
16	Evergreen Dr/Alder Ln	Two-way stop	A/C	0.14/0.41
17	Evergreen Dr/3rd St	Two-way stop	A/E	0.00/0.58
18	Miller Ave/11th St	Two-way stop	A/B	0.10/0.25
19	Miller Ave/3rd St	Two-way stop	A/C	0.05/0.03
20	Stillwell Ave/9th St	Two-way stop	A/B	0.01/0.22

¹ For two-way stop controlled intersections with one-way major approaches, only the minor movement is reported

For unsignalized intersections the worst movement for the major and minor approach are reported

Analysis of the 2017 30 HV PM peak hour traffic indicates that all the study intersections are meeting the v/c mobility targets. Further, most intersections also operate at LOS C or better. The one exception is the intersection of Evergreen Drive/3rd Street, where the northbound approach has a LOS E, but the intersection still meets the mobility target with a v/c ratio of 0.58.

Truck Freight Traffic

Table 9 summarizes the heavy vehicle percentages by approach at each study intersection. Truck traffic ranges from zero to eight percent during the PM peak hour. Heavy vehicle traffic is highest along US-101, followed by OR-6. This is consistent with OR-6's designation as a state freight route and with the

location of industrial businesses along US-101, which is partially designated as a freight route¹⁷. Although the largest percentage of truck traffic occurs on Wilson River Loop at OR-6 (7%), this is only equivalent to about 10 trucks at those approaches during the peak hour. The highest truck volume occurs on the southbound approach of US-101 SB (Main Avenue) at OR-6 WB (1st Street), with 44 vehicles during an hour. Generally, heavy vehicles are more likely to be traveling north-south. Some of the local freight movement in Tillamook may be attributed to the lumber mill (located just east of downtown), the Tillamook Cheese Factory, and other various industrial businesses along Front Street.

TABLE 9. HEAVY VEHICLE TRAFFIC

Study Intersection	Approach			
	North	South	East	West
US-101/Wilson River Loop	3%	3%	4%	3%
US-101 SB (Main Ave)/Front St	-	4%	0%	-
US-101 SB (Main Ave)/OR-6 WB (1st St)	-	5%	1%	4%
US-101 NB (Pacific Ave)/OR-6 WB (1st St)	3%	-	-	5%
US-101 SB (Main Ave)/OR-6 EB (3rd St)	-	5%	5%	-
US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	4%	-	4%	-
US-101 SB (Main Ave)/4th St	-	4%	1%	3%
US-101 NB (Pacific Ave)/4th St	4%	-	1%	3%
US-101 SB (Main Ave)/11th St	-	4%	0%	1%
US-101 NB (Pacific Ave)/11th St	3%	-	4%	2%
Wilson River Loop North/OR-6	-	7%	5%	8%
Wilson River Loop South/OR-6	7%	-	4%	7%
Stillwell Ave/OR-131 (3rd St)	2%	4%	5%	2%
Marolf Loop Rd/3rd St	1%	-	2%	2%
Evergreen Dr/12th St	-	0%	2%	2%
Evergreen Dr/Alder Ln	1%	1%	-	0%
Evergreen Dr/3rd St	2%	0%	2%	2%
Miller Ave/11th St	0%	2%	1%	-
Miller Ave/3rd St	3%	0%	4%	2%
Stillwell Ave/9th St	2%	3%	0%	0%

Safety

A safety analysis was conducted to determine whether any significant, documented safety issues exist within the management area and to inform future measures or general strategies for improving overall safety. This analysis includes a review of crash records, crash rates, and ODOT Safety Priority Index System (SPIS) data.

Crash Trends

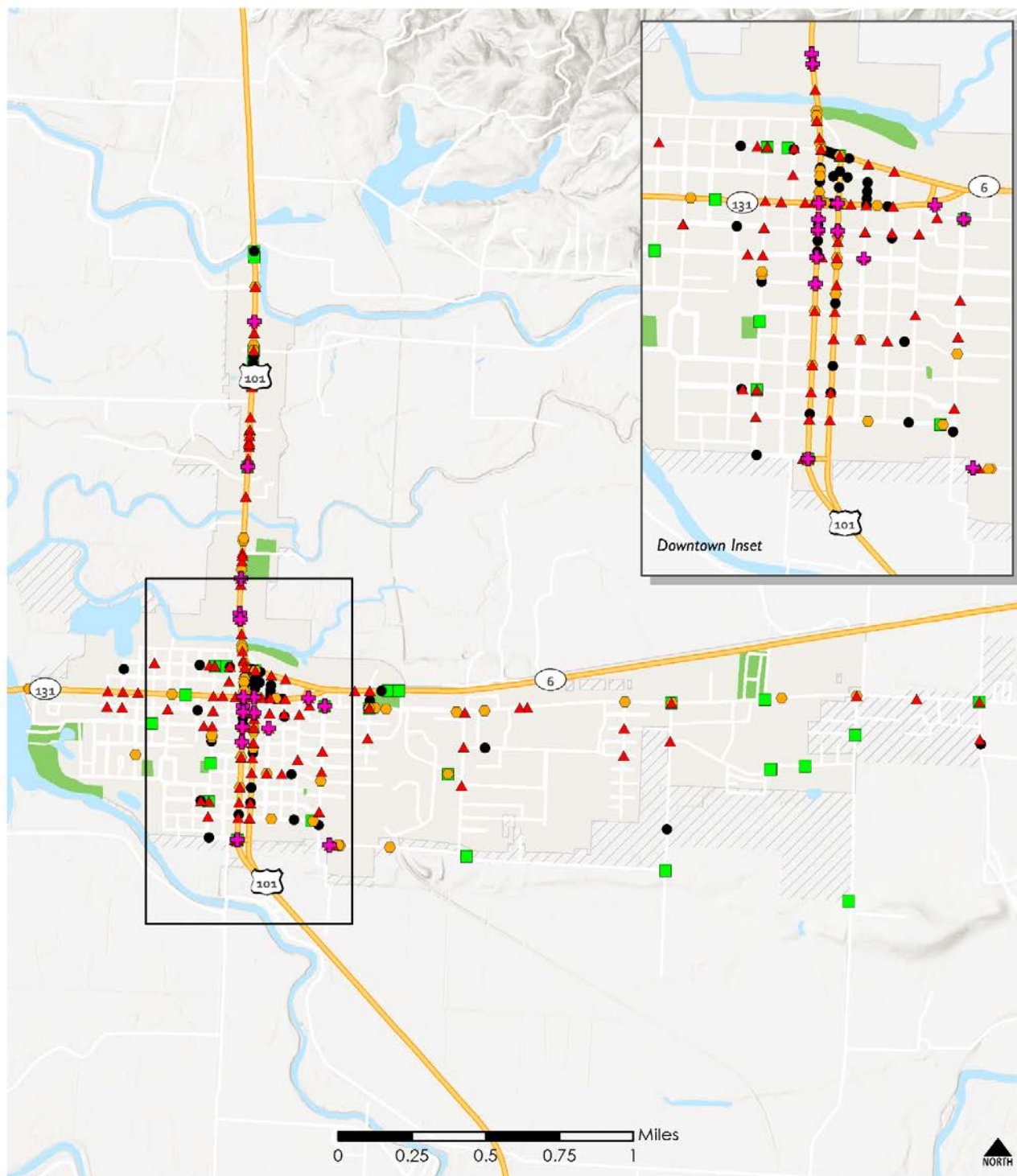
The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2011, and December 31, 2015, which were the five most recent full years for which crash data were available at the time of the analysis. The crash data

¹⁷ US 101 is designated as a state freight route north of 3rd street, and is a city freight route south of 3rd Street along the couplet. South of the couplet US 101 is not designated as a freight route.

within the Tillamook UGB is summarized by type and severity in Figure 19 and Figure 20. Detailed crash reports are included in the Appendix.

Additionally, a heat map analysis of the density of crashes was created for the Tillamook Crash data (Figure 21). The heat map shows that crashes are concentrated along the highways, especially US-101 in the downtown area. The heat map is based on total crashes, and thus tends to identify hot-spots where total crashes are more common but does not distinguish the crash rate relative to total traffic volumes (which is reported in following tables).

FIGURE 19. COLLISION TYPES (2011-2015)



2011 - 2015 Collision Types



City of Tillamook, Oregon
Transportation System Plan

Legend

Collision Type

- ▲ Angle or Turn
- Fixed Object
- ✚ Pedestrian or Bicycle
- Rear-end
- Other*

*Other includes sideswipe, parked, backing, and head-on collisions

Waterbodies

Parks

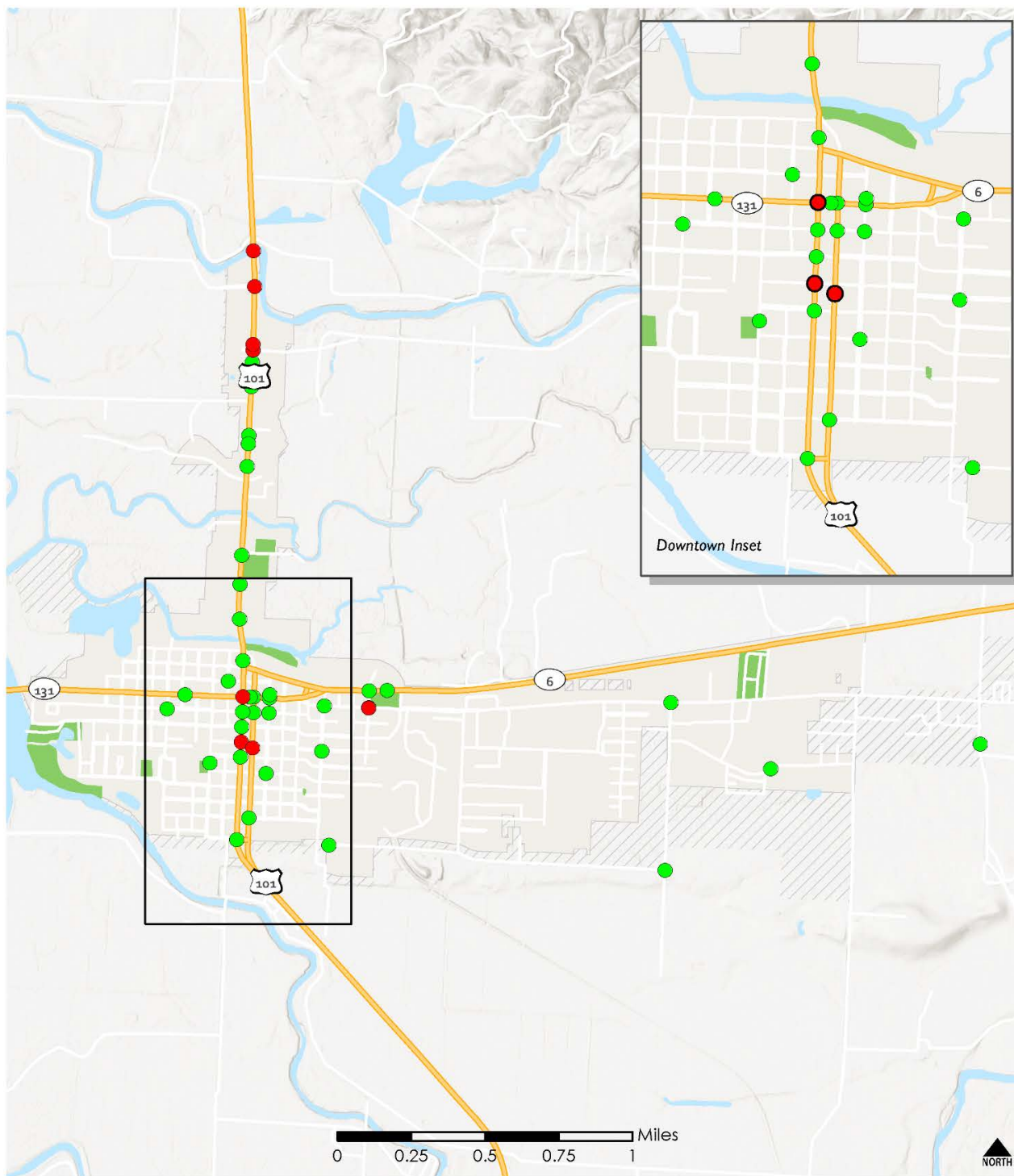
City of Tillamook

Urban Growth Boundary

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FIGURE 20. COLLISION SEVERITY (2011-2015)



2011 - 2015 Collision Severity



City of Tillamook, Oregon
Transportation System Plan

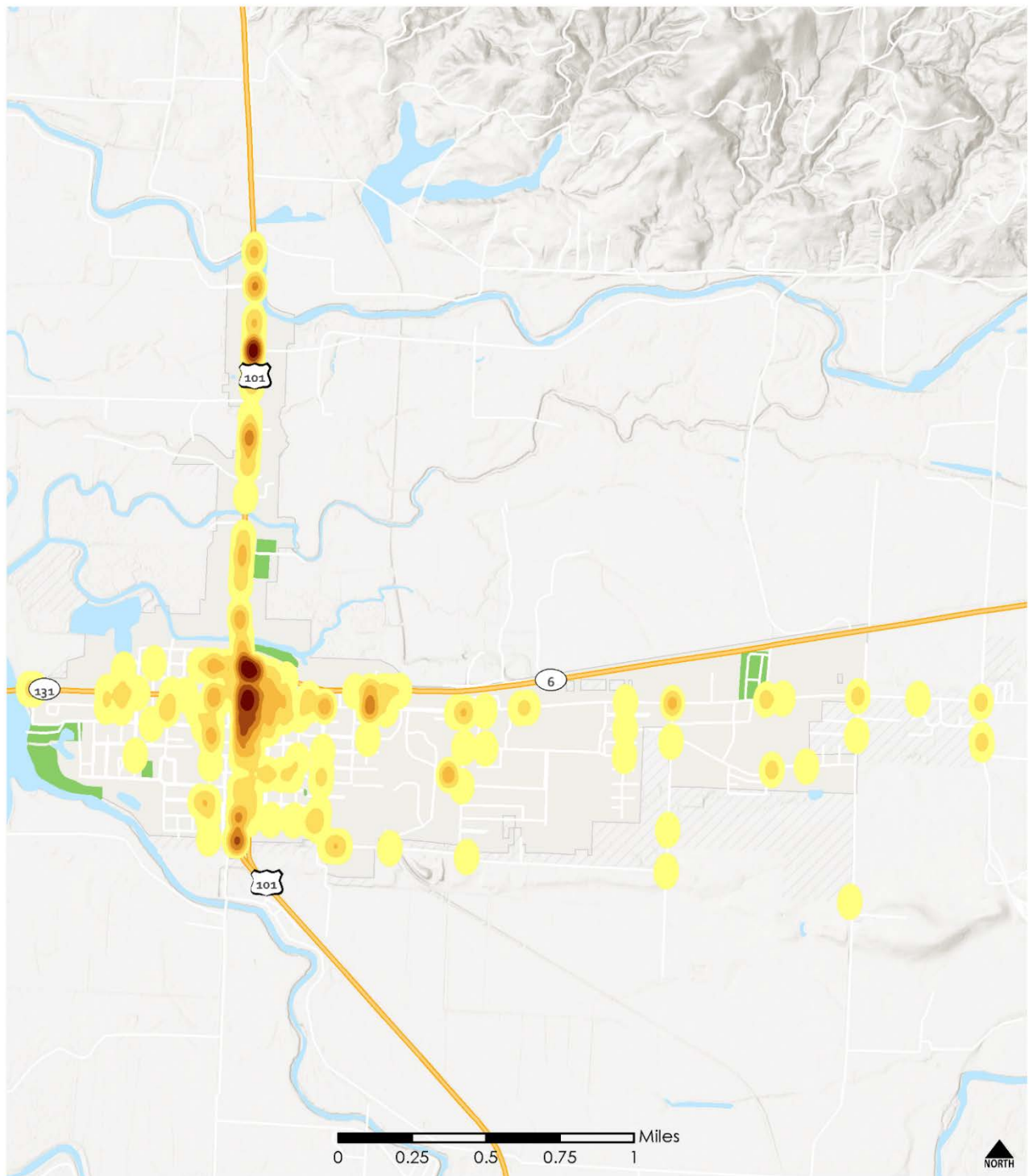
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- Collision Severity**
- Injury A
 - Injury B
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary
- Note: no fatalities were reported

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FIGURE 21. COLLISION DENSITY (2011 - 2015)



2011 - 2015 Collision Density



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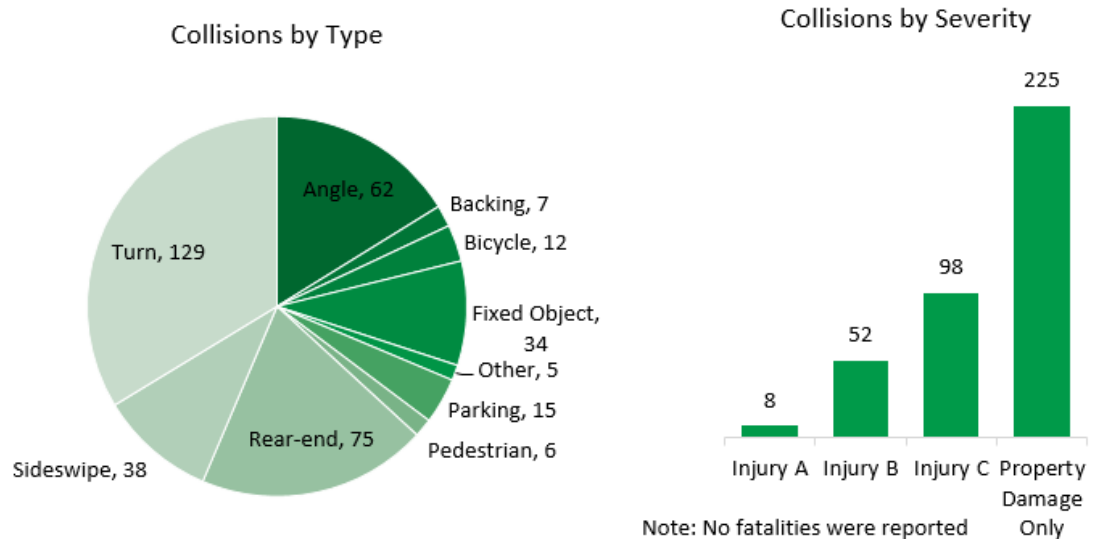
Collisions*	6 - 11	Highways
0 - 1	11 - 16	Waterbodies
1 - 3	16 - 25	Parks
3 - 6		City of Tillamook
		Urban Growth Boundary

* within a 330 foot radius

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Within Tillamook, there were 383 crashes during the five-year analysis period. A breakdown of the collision types and crashes by year is presented in the charts below. Injury A represents severe injuries, Injury B indicates moderate injuries, and Injury C denotes minor injuries. Over half of the crashes were property damage only, and no fatalities were reported.

FIGURE 22. TILLAMOOK COLLISION SUMMARY (2011-2015)



A more detailed analysis was completed for study intersections. There were 104 crashes reported at study intersections during the five-year analysis period, which were evaluated by using several different screening methods summarized in the following sections.

Critical Crash Rate

The Highway Safety Manual (HSM) Part B describes the critical crash rate method as a means of identifying locations that warrant further investigation. The critical crash rate is based upon average crash rates at comparable sites, traffic volume, and a confidence interval. Locations where the calculated crash rate exceeds the critical crash rate should be reviewed more closely to assess crash patterns. HSM Part B calculations are available in the appendix. Table 10 presents the results of the critical crash rate analysis.

TABLE 10. CRITICAL CRASH RATE ANALYSIS

No.	Intersection	Observed Crash Rate	Critical Crash Rate	90th Percentile Crash Rate
1	US-101/Wilson River Loop	0.59	0.75	0.86
2	US-101 SB (Main Ave)/Front St ^A	0.13	0.31	0.29
3	US-101 SB (Main Ave)/OR-6 WB (1st St)	0.70	0.82	0.86
4	US-101 NB (Pacific Ave)/OR-6 WB (1st St)	0.61	0.82	0.86
5	US-101 SB (Main Ave)/OR-6 EB (3rd St)	0.41	0.80	0.86
6	US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	0.42	0.80	0.86
7	US-101 SB (Main Ave)/4th St	0.45	0.83	0.86
8	US-101 NB (Pacific Ave)/4th St	0.46	0.86	0.86
9	US-101 SB (Main Ave)/11th St	0.49	0.58	0.41

10	US-101 NB (Pacific Ave)/11th St	0.07	0.55	0.41
11	Wilson River Loop North/OR-6	0.00	0.28	0.48
12	Wilson River Loop South/OR-6	0.00	0.31	0.48
13	Stillwell Ave/OR-131 (3rd St)	0.39	0.57	0.41
14	Marolf Loop Rd/3rd St	0.40	0.33	0.48
15	Evergreen Dr/12th St	0.00	0.43	0.48
16	Evergreen Dr/Alder Ln	0.11	0.35	0.48
17	Evergreen Dr/3rd St	0.19	0.28	0.48
18	Miller Ave/11th St	0.00	0.40	0.48
19	Miller Ave/3rd St	0.37	0.56	0.41
20	Stillwell Ave/9th St	0.00	0.76	0.41

Bold indicates crash rate over critical crash rate, **red** indicates crash rate over statewide 90th percentile crash rate

^A Not enough of intersection type to perform reference population critical crash rates; statewide critical crash calculated from APM Exhibit 4-1 instead

The intersection of US-101 (Main Avenue) and 11th Street has an observed crash rate that is greater than the statewide 90th percentile rate. The observed crash rate for Marolf Loop Road and 3rd Street exceeds the critical crash rate for its reference population. These locations are flagged as safety focus locations and need further review to identify potential countermeasures.

Excess Proportion of Specific Crash Types

The Excess Proportion of Specific Crash Types method quantifies the extent to which a specific crash type (the target crash type) is overrepresented at an analysis site, compared to the average representation within a reference population¹⁸. The reference population is made up of other study intersections with similar characteristics. Excess proportion of specific crash types analysis does not consider the overall frequency or rate of crashes, instead it considers only the types of crashes observed. Table 11 summarizes the excess proportion for each crash type that exceeds the average of the reference population by more than ten percent. Further details on calculation are provided in the appendix.

TABLE 11. EXCESS PROPORTION CRASH LOCATIONS

Intersection	Crash Type	Excess Proportion
US-101/Wilson River Loop	Turn	0.18
US-101 SB (Main Ave)/OR-6 WB (1st St)	Rear-end	0.14
US-101 NB (Pacific Ave)/OR-6 WB (1st St)	Turn	0.23
US-101 SB (Main Ave)/OR-6 EB (3rd St)	Pedestrian	0.18
US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	Angle	0.18
US-101 SB (Main Ave)/4th St	Angle	0.34
US-101 NB (Pacific Ave)/4th St	Angle	0.13
US-101 SB (Main Ave)/11th St	Turn	0.42
Stillwell Ave/OR-131 (3rd St)	Angle	0.25
Evergreen Dr/3rd St	Turn	0.25
Miller Ave/3rd St	Fixed Object	0.28

¹⁸ Oregon Department of Transportation. Analysis Procedures Manual Version 2, Section 4.3.5, p. 4-76. 2016.

The first eight intersections along US-101 are urban signalized intersections and are in the same reference population, which means they are only compared to other similar intersections in the study area. Among those intersections on US-101, only three pedestrian crashes occurred, two of which occurred at the intersection with OR-6 (3rd Street). Therefore, that intersection was found to have an excess proportion of pedestrian crashes, with a magnitude of 18 percent. Other notable intersections in the table above include US-101 SB (Main Ave) at 11th Street which has an excess proportion of 0.42 for turn collisions (five collisions total). Since this intersection is stop controlled, it was compared to other stop controlled intersections, some of which were off the highway in more local areas. Additionally, US-101 SB (Main Ave) at 4th Street has an excess proportion of angle crashes (three collisions total). This indicates that more angle crashes occur here than other signalized highway intersections. Fixed object collisions seem to be more common at Miller Avenue and 3rd Street, which will be investigated further to identify potential counter-measures. While some results from the excess proportion screening method are influenced by the selection of other study intersections in the reference population, it does effectively indicate where countermeasures targeted at a specific collision type may be beneficial.

Safety Priority Index System (SPIS)

The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while taking traffic volume into account. When a segment is ranked in the top 10% of the index, a crash analysis is typically warranted and corrective actions are considered. There is one segment along US-101 within the study area that is identified as being in the top 10% of the 2015 SPIS rankings. The segment is approximately a 950-foot segment of US-101 (MP 64.48-64.66) centered around the intersection of US-101 and Wilson River Loop Road, which is also a study intersection.

Segment Analysis

Crash rates identifying the number of crashes per million vehicle miles traveled were calculated for sections of US-101, OR-6, and OR-131 throughout the city and compared to statewide average rates for similar highways. The reported crash rates are shown in Table 12.

TABLE 12. SEGMENT CRASH RATES (2011 - 2015)

Highway	Segment			Average for 2011-2015		
	Start MP	End MP	Description	Observed Crash Rate	Statewide Crash Rate	Observed Rate > Statewide Rate
US-101	64.23	65.64	North City Limits to Main Ave & 1 st - begin couplet	1.82	2.90	No
	65.64	65.74	1st St to 3rd St/OR-6 - SB	9.12*	2.90	Yes
	65.74	66.26	3rd St/OR-6 to South City Limits - SB	8.53*	2.90	Yes
	65.64	65.68	1st St & Main Ave to 1st St & Pacific Ave - NB	19.32*	2.90	Yes
	65.68	65.77	1st St & Pacific Ave to 3rd St/OR-6 - NB	11.15*	2.90	Yes
	65.77	65.87	3rd St/OR-6 to 5th St - NB	14.98*	2.90	Yes
	65.87	66.26	5th St to South City Limits - NB	4.10*	2.90	Yes
OR-6	0.00	0.03	Begin couplet to US-101/Pacific Ave - EB	14.06*	3.22	Yes
	0.03	0.29	US-101/Pacific Ave to end couplet - EB	5.58*	3.22	Yes
	0.00	0.29	Begin couplet to end couplet - WB	2.67	3.22	No

OR-131	0.29	0.48	end couplet to East City Limits	3.56	3.22	Yes
	0.48	2.13	East City Limits to Schild Rd	1.63	1.50	Yes
	8.29	8.41	Enter Urban Area to West City Limits	5.08	1.55	Yes
	8.41	9.08	West City Limits to US-101/Main St	3.14	1.37	Yes

Note: * Crash rates for segments that are less than one mile in length may be artificially inflated. However, for the locations noted the observed crash rate will exceed the statewide rate regardless of whether the segments are grouped into longer segments or not. Therefore, the finding would not change and the original segment rates were reported to retain consistency with the published rates.

All of the highway segment observed crash rates exceed the statewide average for 2011-2015 except for two segments: US-101 from the northern city limits to 1st Street and OR-6 Westbound from Miller Avenue to Pacific Avenue. This finding may be skewed (artificially inflated) due to the fact that most segments are less than one half mile in length, which means they are disproportionately impacted by clusters of collisions near intersections¹⁹. Additionally, the US-101 segment that was not flagged in this segment analysis is designated as a SPIS site as discussed in the previous section. Further investigation is required to identify segments that would benefit from applying countermeasures to the other segments that exceed the statewide average.

Access Management

Access management is key to balanced urban growth. A lack of a prudent access management plan can lead to miles of strip commercial development along arterial streets of urban areas. Business activities along arterial streets lead to increased traffic demands and additional driveways, which lead to an increased number of potential conflict points among vehicles entering and exiting the driveways. This leads to increased vehicle delay and deterioration in the level of service on the arterial. Increases in volumes and conflict points may also lead to a reduction in safety. Thus, it is essential that all levels of government try to maintain the efficiency of existing streets through better access management.

Access to the major arterials serving Tillamook under existing conditions was assessed to identify areas needing improvement. A review of the findings for the major corridors in the study area are summarized in the following tables. Table 13 presents the ODOT spacing standards for each facility, as defined in the OHP.

TABLE 13. ACCESS SPACING STANDARDS FOR STATE HIGHWAYS ²⁰

Facility	Designation	Access Spacing (feet) for the Posted Speed (mph)				
		≤25	30-35	40-45	50	≥55
US-101	Rural Statewide Highway	550	770	990	1100	1320
OR-6	Rural Regional Highway	450	600	750	830	990
OR-131	Rural District Highway	400	400	500	550	700
All	Downtown Areas ^A	city block	270	mid-block	135	

^A Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 150 feet (46 meters) or mid-block if the current city block is less than 300 feet (91 meters).

¹⁹ Oregon Department of Transportation. Analysis Procedures Manual, Version 2, Section 4.3.4 Critical Crash Rate. 2017.

²⁰ Oregon Department of Transportation. 1999 Oregon Highway Plan, Appendix C, Tables 14-16. 1999.

To compare the existing approach spacing to the ODOT access management spacing standards, the state highways in Tillamook were divided into sections according to spacing standards, based on highway designation and posted speed. The tables below compare the number of approaches and spacing that were observed to the appropriate spacing standard and indicate whether the segment meets the standard. Table 14 compares the access spacing for US-101.

TABLE 14. US-101 EXISTING APPROACH SPACING

Segment	Number of Approaches	Segment Length (Feet)	Approach Spacing (Feet)		Number of Approaches to Meet Standard	Standard Met
			Actual	Standard		
Northbound						
Northern UGB Limits to Larson Road	8	3230	400	990	3	No
Larson Road to Front Street	14	3970	280	770	5	No
Front Street to 6th Street	14	1630	120	135	12	No
6th Street to Southern UGB Limits	21	2040	100	135	15	No
Southbound						
Northern UGB Limits to Larson Road	9	3230	360	990	3	No
Larson Road to Front Street	20	3970	200	770	5	No
Front Street to 6th Street	13	1630	130	135	12	No
6th Street to Southern UGB Limits	21	2040	100	135	15	No

US-101 is a statewide highway classified as a rural principle arterial. However, there are many developed business surrounding the highway on both sides. This leads to more driveways along the highway than the standard allows. None of the segments of US-101 meet the standard. Table 15 presents the access spacing for OR-6.

TABLE 15. OR-6 EXISTING APPROACH SPACING

Segment	Number of Approaches	Segment Length (Feet)	Approach Spacing (Feet)		Number of Approaches to Meet Standard	Standard Met
			Actual	Standard		
Westbound						
Schild Road to Evergreen Drive	4	7340	1840	990	7	Yes
Evergreen Drive to Del Monte Avenue	1	1740	1740	750	2	Yes
Del Monte Avenue to Miller Avenue	5	790	160	600	1	No
Miller Avenue to US-101 North	16	1290	80	135	10	No
Eastbound						
Schild Road to Evergreen Drive	2	7340	3670	990	7	Yes
Evergreen Drive to Del Monte Avenue	1	1740	1740	750	2	Yes
Del Monte Avenue to Miller Avenue	6	790	130	600	1	No
Miller Avenue to US-101 North	14	1290	90	135	10	No

OR-6 is a regional highway classified as a rural minor arterial. The segments to the east have less access as they are less developed. As a result, the segments between Schild Road and Del Monte Avenue meet

the spacing standard. As OR-6 extends to the west, it enters a residential and more commercially developed area, which has more driveways and access points, both public and private. As such, this section of OR-6 does not meet standard. Existing spacing for OR-131 is presented in Table 16.

TABLE 16. OR-131 EXISTING APPROACH SPACING

Segment	Number of Approaches	Segment Length (Feet)	Approach Spacing (Feet)		Number of Approaches to Meet Standard	Standard Met
			Actual	Standard		
Westbound						
US-101 South to Grove Avenue	7	800	110	135	6	No
Grove Avenue to Western UGB Limits	17	3250	190	135	24	Yes
Eastbound						
US-101 South to Grove Avenue	3	800	270	135	6	Yes
Grove Avenue to Western UGB Limits	24	3250	140	135	24	Yes

OR-131 is a district highway that runs through a mix of commercial and residential development with short city blocks. This produces a spacing standard that allows frequent public street and private driveway access. As a result, all but one segment of the facility meets the spacing standard.

As a whole, the highways in Tillamook are not currently meeting their respective access spacing standards. This is often due to business development along most of the corridors. OR-6 to the east of Del Monte Avenue is relatively undeveloped and meets the spacing standard. In the downtown area, there are often multiple private driveways in between blocks. This can lead to an unnecessary amount of vehicular and pedestrian conflicts. The City has attempted to mitigate this situation by giving up accesses on FEMA purchased properties that have more than one driveway, as well as consolidating highway access points to adjoining parcels.

Access spacing on these roadways can be improved and move toward conformance with ODOT standards through regulation of future development and redevelopment. New developments should be required to place access approaches on side streets, where feasible, and encouraged to develop joint access agreements with neighboring properties. Modifications to existing access management regulations may be recommended as part of Technical Memorandum #12 – Implementing Ordinances.

Bicycle and Pedestrian Operations

Bicycle and Pedestrian Volumes

Pedestrian and bicycle facilities are important components of the transportation system. Aside from providing a necessary mode of transportation, a community's pedestrian system also offers recreational opportunities for both local and out-of-town users. Tillamook's 2020 Vision Statement identifies a comprehensive non-motorized system as key to creating an attractive and inviting walking atmosphere in the community. The vision also includes a mix of commercial uses downtown to reinforce the pedestrian-friendly aspect of the city center. Pedestrian volumes at the study intersections for the PM peak hour and for a four-hour PM period were summarized in Table 17 to illustrate where the where major pedestrian flows occur (based on data collected during summer months).

TABLE 17. STUDY INTERSECTION PEDESTRIAN VOLUMES

Intersection	Peak Hour Volume (4:20-5:20 PM or 4:50-5:50 PM)					Four Hour Volume (2-6 PM)				
	North	South	East	West	Total	North	South	East	West	Total
US-101/Wilson River Loop	2	8	0	0	10	5	12	3	9	29
US-101 SB (Main Ave)/Front St	0	0	5	1	6	0	2	14	7	23
US-101 SB (Main Ave)/OR-6 WB (1st St)	0	11	0	14	25	1	26	0	19	46
US-101 NB (Pacific Ave)/OR-6 WB (1st St)	1	7	0	0	8	1	11	5	7	24
US-101 SB (Main Ave)/OR-6 EB (3rd St)	21	11	8	13	53	62	44	46	68	220
US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	19	9	16	9	53	78	28	49	38	193
US-101 SB (Main Ave)/4th St	14	22	8	20	64	54	42	22	75	193
US-101 NB (Pacific Ave)/4th St	16	19	4	9	48	39	49	17	21	126
US-101 SB (Main Ave)/11th St	0	1	1	4	6	0	7	4	12	23
US-101 NB (Pacific Ave)/11th St	3	3	3	1	10	6	10	4	4	24
Wilson River Loop North/OR-6	0	0	0	0	0	0	0	0	0	0
Wilson River Loop South/OR-6	0	0	0	0	0	0	0	0	0	0
Stillwell Ave/OR-131 (3rd St)	19	9	7	30	65	71	22	33	83	209
Marolf Loop Rd/3rd St	1	0	0	0	1	1	4	0	0	5
Evergreen Dr/12th St	0	1	1	0	2	4	4	4	0	12
Evergreen Dr/Alder Ln	0	3	10	4	17	2	4	25	5	36
Evergreen Dr/3rd St	0	1	0	0	1	0	10	0	0	10
Miller Ave/11th St	0	0	0	4	4	0	0	9	13	22
Miller Ave/3rd St	1	4	0	0	5	3	25	1	0	29
Stillwell Ave/9th St	0	0	4	5	9	41	3	27	29	100

The majority of pedestrian traffic occurs in the downtown area centered at US-101 SB (Main Avenue), US-101 NB (Pacific Avenue), OR-6 (3rd Street), and 4th Street. Stillwell Ave at OR-131 (3rd Street) also has a fair amount of pedestrian traffic, which is likely due to its proximity to the Safeway grocery store. Some intersections, such as those on the east side of town, had little to no pedestrian traffic at all. The four-hour volumes are useful to get a sense of pedestrian travel patterns over time, since pedestrian volumes often do not peak at the same time as motor vehicle volumes. Some intersections along US-101 have approximately 50 pedestrians during the peak hour, which generally accounts for approximately 25 to 40 percent of the total four-hour pedestrian volume. Intersections on the east side of downtown tend to have a lower share of pedestrian activity during the peak vehicle hour (relative to the four-hour window), which may be partially due to school travel that occurs outside of the vehicle peak hour. The intersection of Stillwell Avenue/9th Street had only nine pedestrians observed during the vehicle peak hour but 100 observed during the four-hour period. Bicycle volumes at over half of the study intersections are one or less per hour, with the remaining intersections having less than five bicycles per hour.

Bicycle System Deficiencies

The existing bicycle system has few dedicated bicycle facilities. Currently, cyclists entering the City from the north via existing shoulder bike lanes on US-101 must merge into a shared roadway environment upon entering downtown, as the bike lanes end at OR-6 / 1st Street. Bicyclists traveling through downtown along the US-101 couplet (SB Main and NB Pacific Avenues) must share the road with

vehicles and navigate through on-street parking. Bicycle signage and markings are also minimal through downtown.

OR-6 1st and 3rd Streets is a shared roadway between the western City limits and Trout Street, and becomes a shoulder bikeway east of Trout Street. Bicyclists must bike in traffic in both designations with minimal signage and no dedicated bike markings. The short segment of bike lane between Evergreen Drive and Marolf Loop Drive serves Tillamook Bay Community College. This segment does not connect to any other bicycle facilities and only has a sidewalk for about half of its length. Currently, there is no designated route for accessing the OR-6 shoulder bikeway to the north.

There are currently no bicycle facilities on Tillamook local streets. There is a need to develop a connected bicycle network connecting local streets to key destinations within the City.

Bicycle needs identified in the previous Tillamook TSP (2003) will also be evaluated as part of the TSP update.

Pedestrian System Deficiencies

Although the pedestrian network is generally well-developed within downtown Tillamook, several elements of the pedestrian system are in need of update or repair. In some locations, crosswalks are faded and difficult to see and a high number of driveways and private accesses create a barrier to continuous, connected pedestrian facilities. Pedestrian signalization is largely lacking throughout most of the City.

Pedestrian connectivity along the City's arterial and collector network is inconsistent outside of the downtown core. East of Miller Avenue, there are currently no sidewalks or ADA curb ramps along 12th Street, Marolf Loop Drive, Brookfield Avenue, or McCormick Loop Drive. OR-6 1st and 3rd Streets are mostly without sidewalks east of Miller Avenue and are devoid of ADA curb ramps.

Sidewalk connectivity is inconsistent on local streets. Some neighborhoods have complete sidewalk networks on both sides of the street, while others do not. Where local streets are lacking sidewalks, pedestrians must share the roadway with bicyclists and vehicle traffic along narrow roadway shoulders. In more recently developed residential areas, newly constructed pedestrian facilities do not always connect to older parts of the City, resulting in a disconnected network, requiring pedestrians to walk on paved or gravel shoulders. Figure 23 displays City staff-recommended pedestrian, bicycle, and roadway connectivity needs.

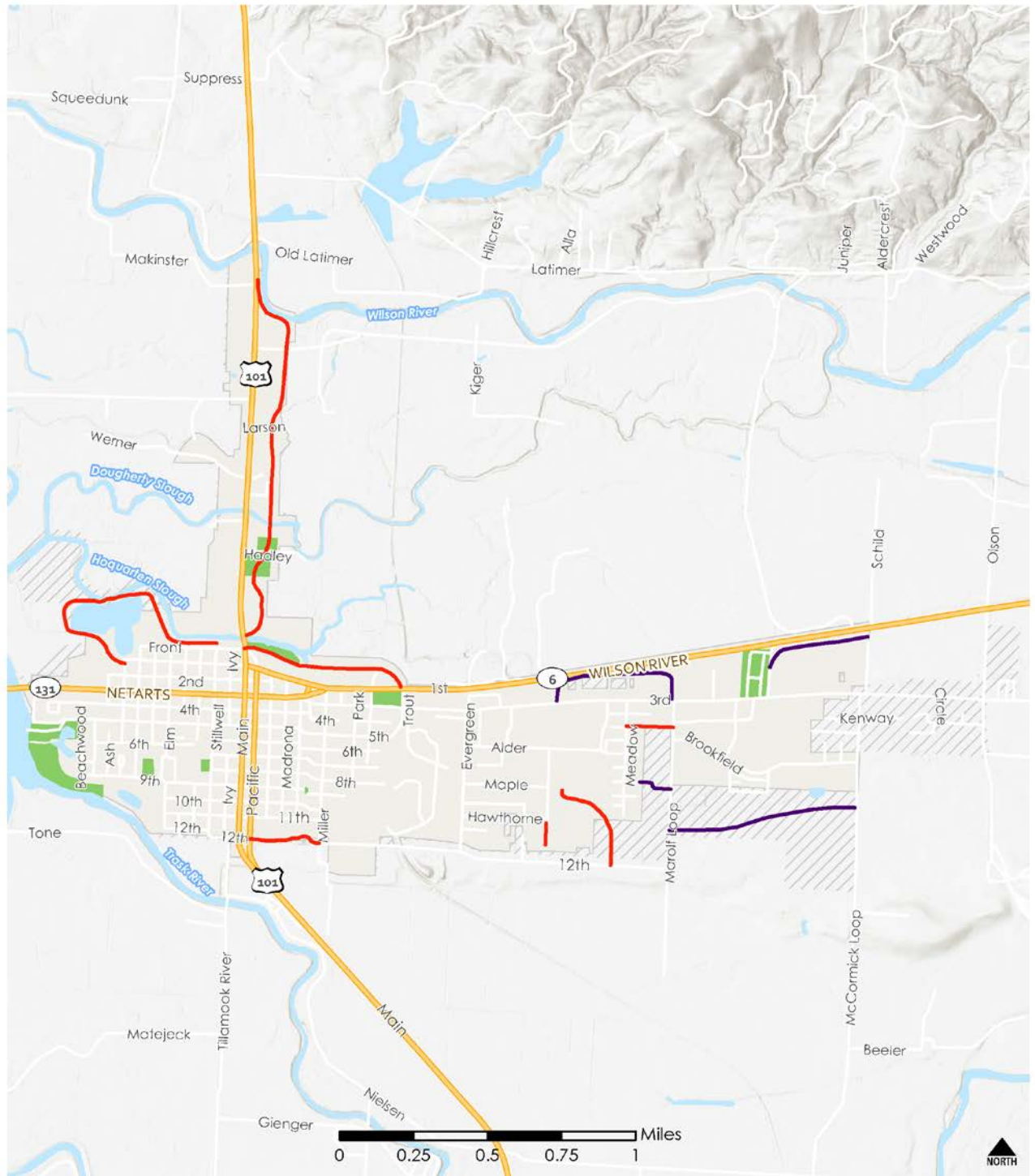
Emergency Response and Evacuation Routes

For the Tillamook region, US-101, OR-131, OR-6, Latimer Road, and Wilson River Loop are designated as lifeline routes. US-101 (south of OR-6), OR-131, Latimer Road, Wilson River Loop and OR-6 (between US-101 and Wilson River Loop) are designated as Priority 1 lifeline routes, which means they are essential for emergency responses in the first 72 hours after an incident. U.S. 101 (north of OR-6) and OR-6 (east of Wilson River Loop) are designated as Priority 2 lifeline routes, which means they are desirable for emergency responses in the first 72 hours after an incident or are routes essential for economic recovery.

Tillamook also designates emergency priority roads priority in the event of flooding or severe weather (Figure 24). Figure 25 provides a map and information on tsunami evacuation protocol in Tillamook²¹. Much of the city is outside of the hazard area. However, an eastern portion of the city, as well as the northern part of the city along US-101 is in the local tsunami evacuation zone.

²¹ Tsunami Evacuation Map. Oregon Department of Geology and Mineral Industries. Accessed October 2017.
http://www.oregongeology.org/pubs/tsubrochures/TillamookEvac_onscreen.pdf

FIGURE 23. ROADWAY, BICYCLE, AND PEDESTRIAN CONNECTIVITY NEEDS



Roadway, Bicycle, and Pedestrian Connectivity Needs



City of Tillamook, Oregon
Transportation System Plan

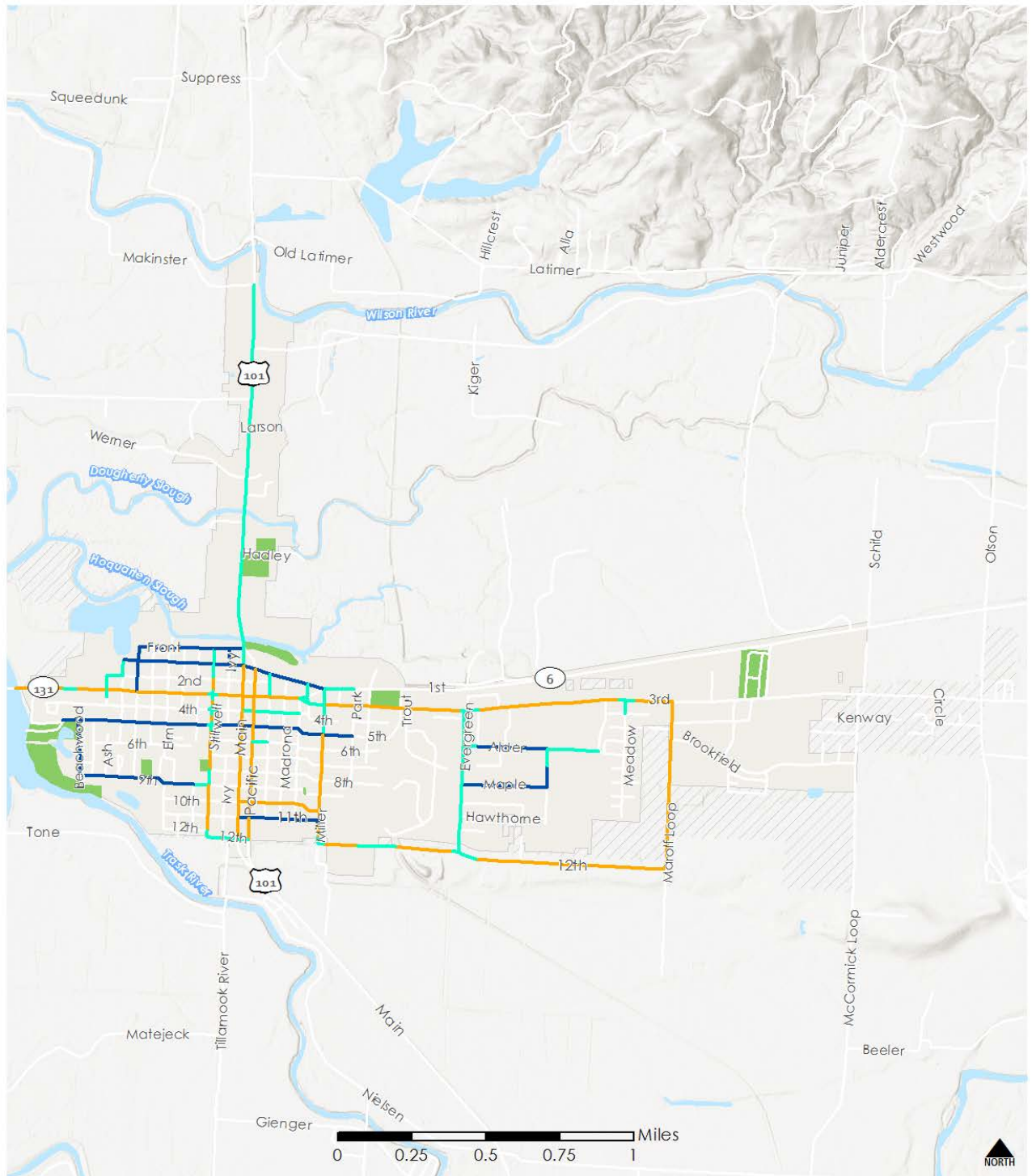
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- Needed Bicycle/ Pedestrian Connectivity
- Needed Road Connectivity
- Highways
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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FIGURE 24. EMERGENCY PRIORITY ROUTES



Emergency Priorities



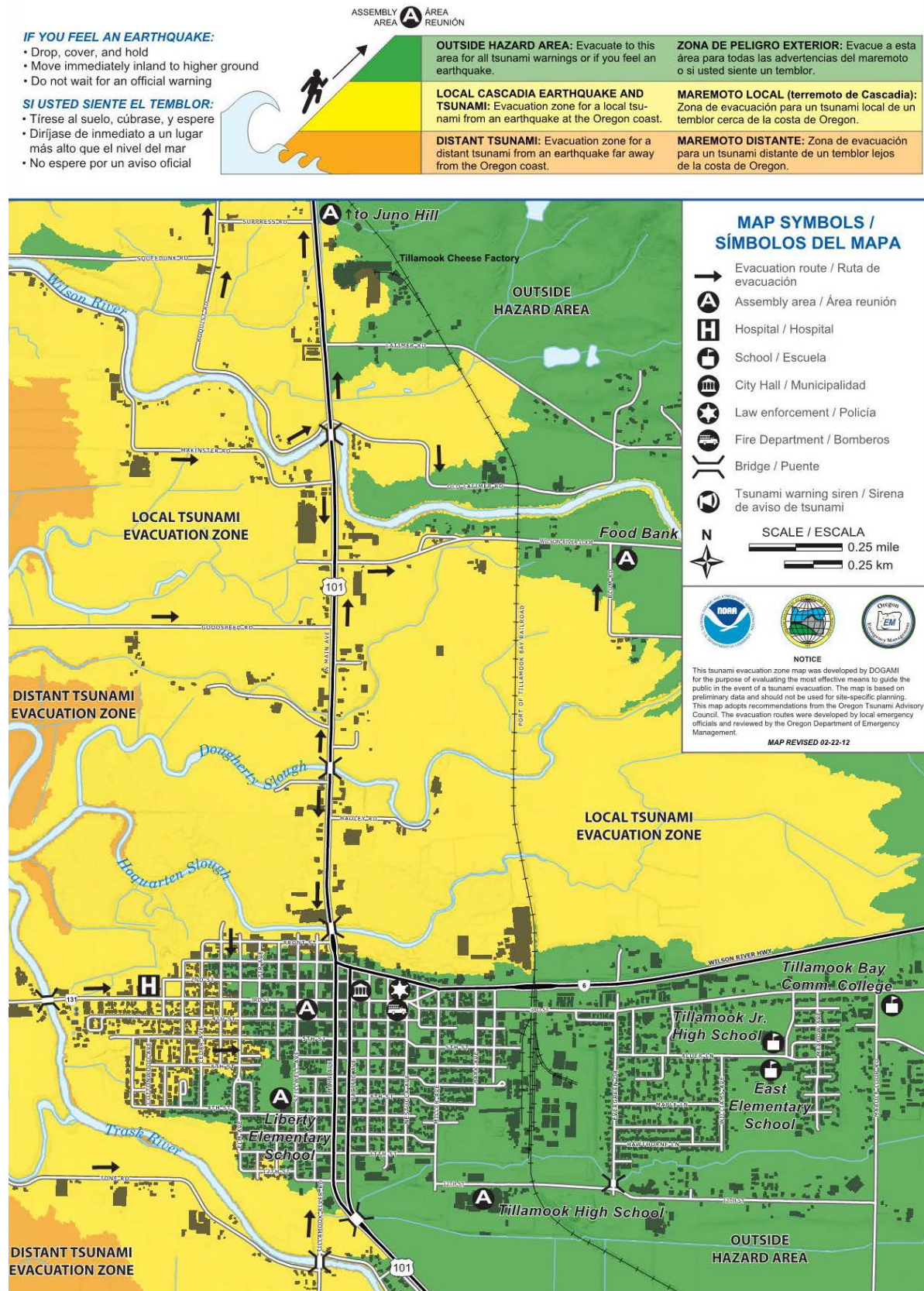
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Emergency Priority	
Deicing Priority	Waterbodies
Level 1	Parks
Level 2	City of Tillamook
	Urban Growth Boundary

FIGURE 25. TSUNAMI EVACUATION MAP



Financial Analysis

This section summarizes transportation revenues and expenditures over the past five years.

The City's Public Works department is served by three funds: Water, Sewer, and the "Streets, Storm Drainage, and Park Fund." The City's primary sources of transportation funding comes from the state gas tax, local gas tax, and recently, ODOT Special City Allotment (SCA) Grants (Table 18). The City's allotment of state gas tax revenues has been relatively stable over the last five years with the exception of fiscal year 2014-15, during which the allotment increased by approximately 48 percent over the previous fiscal year. The City's local fuel tax revenues have marginally increased since fiscal year 2012-13 with the exception of fiscal year 2015-16, during which the fund decreased by 9 percent over the previous fiscal year.

The City was granted ODOT SCA funds in fiscal years 2012-13, 2015-16, and 2016-17. The SCA program is an annual allocation of state funds for local transportation projects in cities with under 5,000 residents. Eligible projects must be on city streets that are not part of a county road or the state highway system. Additionally, SCA funds can only be used on streets that are "inadequate for the capacity they serve or are in a condition detrimental to safety" (ORS 366.805). Some agencies use SCA funds as a local match for larger projects that also meet the intent of SCA. Individual project funding under the SCA program is limited to \$50,000 per project. Cities can request an advance of up to one half (\$25,000). The City of Tillamook may not remain eligible for SCA funds in the future given the population thresholds of the program. As of the 2015 Census, the City of Tillamook had a population of 4,958.

TABLE 18. TILLAMOOK GENERALIZED TRANSPORTATION REVENUES (2012-2017)

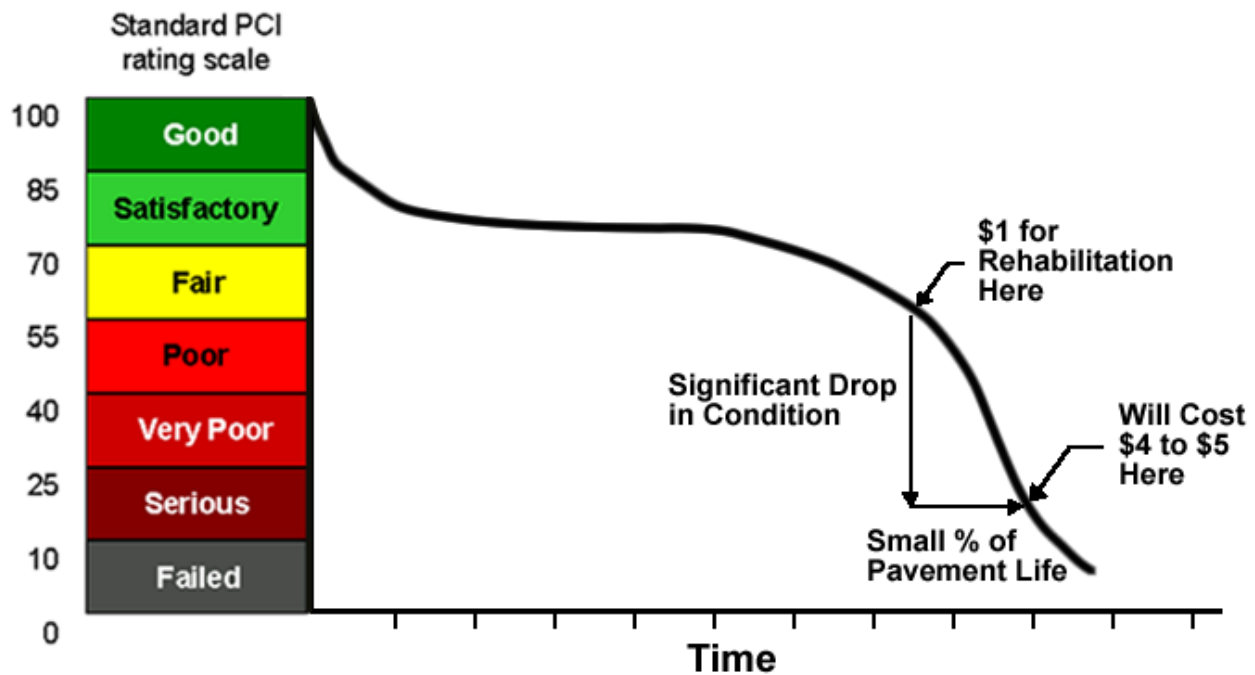
	2012-13	2013-14	2014-15	2015-16	2016-17
	Actual	Actual	Actual	Actual	Adopted
State Gas Tax	\$179,060	\$187,926	\$277,679	\$281,381	\$281,603
ODOT Special City Allotment Grant²²	\$78,036	--	--	\$50,000	\$100,000*
Local Fuel Tax	\$121,516	\$125,799	\$131,753	\$120,000	\$130,000
Total Transportation Revenues	\$378,612	\$313,725	\$409,432	\$451,381	\$511,603
Total Streets, Storm Drainage, and Parks Fund Revenues	\$797,443	\$1,230,817	\$1,150,446	\$1,512,395	\$2,308,103

Source: City of Tillamook (2017). Total Streets, Storm Drainage, and Parks Fund includes unallocated funds that can be expended on transportation projects.

²² ODOT SCA funds for fiscal year 2015-16 were not expended and were subsequently combined with fiscal year 2016-17 SCA funds.

In a given year, the vast majority of the City’s street fund is used for maintenance and roadway preservation. This is a deliberate strategy to maximize the useful benefit of transportation expenditures, since preservation of existing facilities is generally far less costly than investments in large-scale rehabilitation or reconstruction. This “rehab before reconstruction” pavement management approach is graphically illustrated below (Figure 26).

FIGURE 26. PAVEMENT MANAGEMENT - PRESERVATION VS. REHABILITATION CURVE



The City spent approximately \$1.7 million on transportation capital improvements, materials and service, and personnel between fiscal years 2012-13 and 2016-17. Most of these expenditures (88 percent) went to personnel related to transportation system maintenance, with less than 7 percent spent on capital improvements.²³

Between 2012 and 2017, the City’s Personnel budget has increased from approximately \$294,000 to \$373,000. During the same period, the City’s Materials and Services budget increased from approximately \$294,000 to \$480,000. The City’s Capital Improvement Fund has a core of approximately \$90,000 to fund street and sidewalk maintenance expenses, but fluctuates considerably depending on grant and other external funds. Whenever possible, the City maximizes water and sewer project with accompanying street overlays.

As of the writing of this plan (2017), the US-101/OR-6 Traffic Improvement Project is under construction. Construction has also begun for the Crosstown Connections project. The US-101/OR-6 Traffic Improvement Project cost \$28 million. The Oregon Jobs and Transportation Act (HB 2001) provided \$27 million and an additional \$1 million came from other state funding sources. Construction began in 2016 and is expected to be finished in 2018. The Crosstown Connections project is budgeted at \$1.6 million and uses a combination of federal, state, and local (City of Tillamook) funding.

²³ It is difficult to determine a history of ‘street’ or other maintenance costs, since the Streets, Storm Drainage, and Parks Fund contains three different elements within its parameters. Therefore, information related to transportation expenditures is based the City’s best knowledge and spending assumptions.

The City currently does not have a dedicated fund to implement TSP projects and programs. Table 19 below summarizes actual reported expenditures between 2012 and 2017.

TABLE 19. TILLAMOOK GENERALIZED TRANSPORTATION EXPENDITURES (2012 – 2017)

	2012-13	2013-14	2014-15	2015-16	2016-17
	Actual	Actual	Actual	Actual	Adopted
Capital Improvements	\$35,311	\$33,618	\$0	\$42,826	\$5,637
Materials & Services	\$4,139	\$5,798	\$9,920	\$64,391	\$4,147
Personnel	\$278,858	\$383,802	\$290,645	\$260,315	\$327,514
TOTAL	\$318,308	\$423,218	\$300,565	\$367,532	\$337,299

Source: City of Tillamook (2017).



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Appendix F

Future Conditions



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Future Forecasting -Technical Memorandum #6 (PMT DRAFT)

December 20, 2017

Prepared for:

Paul Wyntergreen, City of Tillamook
Ken Shonkwiler, ODOT

Copy to:

Kristin Hull, CH2M
Ryan Farncomb, CH2M

Prepared by:

Garth Appanaitis, DKS
Amanda Deering, DKS

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Introduction

Future traffic forecasting is an important step in the transportation planning process and provides estimates of future travel demand. This memorandum documents the traffic forecasting methodology and results associated with the small community model developed for the Tillamook Transportation System Plan (TSP) Update. The small community modeling approach, in conjunction with post-processing, provides study intersection turn movement forecasts for the 2040 TSP horizon year. These traffic volumes will be analyzed during future steps in the TSP update to identify future traffic needs.

Methodology Overview

The forecasting methodology associated with the small community model (also referred as enhanced zonal cumulative analysis) expands upon a cumulative analysis approach, as defined in the Oregon Department of Transportation (ODOT) Transportation Planning Analysis Unit's (TPAU's) *Analysis Procedures Manual Version 2 (APM V2)*.¹ In the context of the traditional 4-step travel demand model approach, the typical cumulative analysis is used for trip generation and trip distribution purposes only. The result is a trip table (for growth increment only) that is used as an input into traffic assignment where analysis is completed by manually assigning the new trips to a street network and then adding them to existing traffic volumes to estimate future volumes.

The enhanced zonal cumulative analysis tool uses the same trip generation and trip distribution methodology as the typical cumulative analysis, but it applies the methodology to all land uses within the city (i.e., both existing uses as well as any future development based on a land use inventory). The enhanced tool then uses Visum modeling software² and incorporates intersection node delay to complete the equilibrium trip assignment. The result is an improved traffic volume forecasting tool that dynamically assigns both new and existing trips to the transportation network using an equilibrium assignment procedure that represents routing choice more accurately than manual assignment because it is responsive to varying levels of congestion and delay as traffic patterns change. This tool enables a more comprehensive analysis of future conditions and potential TSP alternatives.

The following sections of this memorandum detail each component of the travel forecast methodology associated with the small community model including: the roadway network, transportation analysis zones (TAZs), land use, and travel demand. The resulting 2040 future projected volumes are also provided.

Forecast Tool Components

The following sections summarize the forecast tool components that are used to forecast the future traffic volumes.

Roadway Network

The roadway network included in the Tillamook TSP Visum forecast tool consists of all arterial and collector roadways along with most local public streets within the Tillamook Urban Growth Boundary (UGB). The roadway network is also extended beyond the UGB to capture potential regional routing

¹ *Analysis Procedures Manual Version 2 (APM V2)*, Oregon Department of Transportation (ODOT) Transportation Planning Analysis Unit (TPAU), Last Updated September, 2017.

² VISUM is a transportation travel demand modeling software developed by PTV Vision.

decisions that could result from conditions in the local street system. These areas outside the UGB included in the model for routing potential routing purposes include:

- Latimer Road connection to US 101 north of Tillamook
- Fairview Road connection to OR 6 east of Tillamook
- McCormick Loop Road connecting to US 101 south of Tillamook

An existing roadway network was built using NAVTEQ files as the initial base, with the current street network verified through aeriels and field visits.³ Additional roadway attributes were added based on an existing conditions inventory that included posted speeds, traffic control, lane geometries, and number of travel lanes. The purpose of the existing conditions network was to configure the forecast tool and act as a base in the development of the future tool.

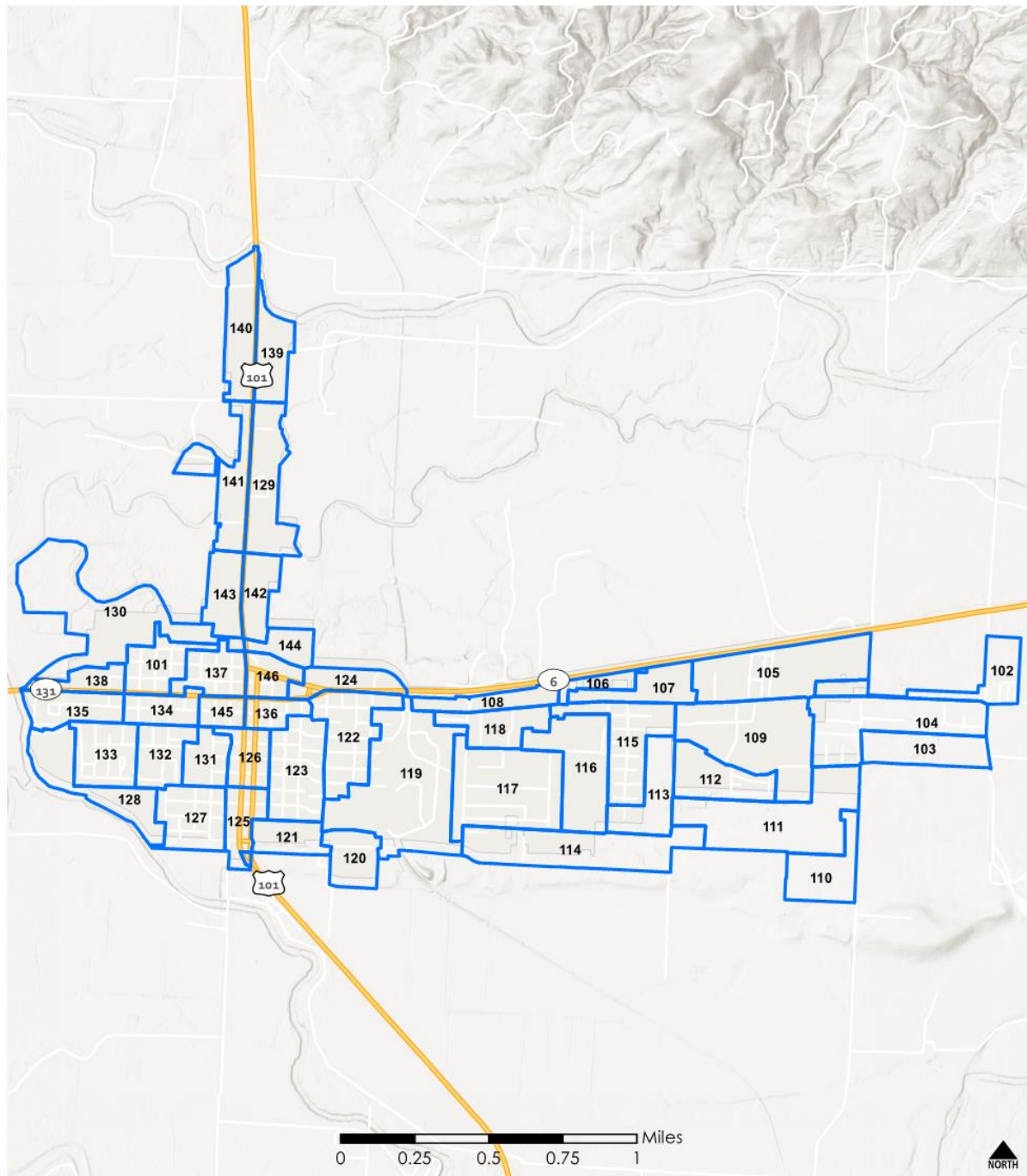
The 2040 future year baseline roadway network was then developed to represent the 2040 No-Build conditions. The City of Tillamook has no plans for major capital improvements within the UGB, and as such the future 2040 roadway network is identical to the existing 2017 network. The 2040 future year network will be further refined as it is used to perform analysis of the various transportation alternatives and improvements to be analyzed for the Tillamook TSP Update.

Transportation Analysis Zones

For transportation forecasting purposes, the Tillamook UGB was divided into 46 transportation analysis zones (TAZs), which represent the sources of vehicle trip generation within the city. These TAZ boundaries were determined based on geographical and physical features allowing the best representation of access for an area, along with maintaining homogenous land use types as much as possible (e.g. residential, commercial, etc.). Centroid connectors were located to best represent access to the street network and major parking facilities. The Tillamook TSP Visum network also includes four external TAZs at the key gateways into and out of the city to account for vehicle trips that enter and exit the region. The internal TAZs are shown in Figure 1.

³ NAVTEQ was a company that provided detailed electronic map data.

FIGURE 1. TILLAMOOK TAZ MAP



TAZ Structure



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Legend

- TAZ
- Highways
- City of Tillamook
- World Hillshade

Land Use

Land use is a key factor affecting travel demands placed on Tillamook's transportation system. The location, density, type, and mix of land uses have a direct impact on traffic levels and patterns. An existing 2017 land use inventory and future 2040 land use projection were performed for each TAZ in the Tillamook UGB based on existing uses, zoning, and anticipated development patterns.

The housing and employment forecasts used for this TSP analysis relied heavily on four key sources of data:

1. The Portland State University Population Research Center prepared the *Coordinated Population Forecast, 2015 through 2065, for Tillamook County Urban Growth Boundaries (UGB) and Area Outside UGBs*, which provided the population forecast data.
2. The US Census *2015 Planning Database Block Group Data*, which provided average persons per household data.
3. Oregon Employment Department inventory of Covered Employers and Employment

The base 2017 land use inventory approximated the number of households and the amount of retail employment, service employment, educational employment, and other employment that currently exist in each TAZ. Existing land uses within Tillamook were obtained from Oregon Employment Department data and a review of other data sources (tax assessor data, census data, and zoning data and compared with existing aerial photography). The existing land uses correspond to a population of 5,569 residents, which is based on Portland State University Population Research Center estimates.

The future 2040 land use projection is an estimate of the amount of each land use (household and employment) that the TAZ could reasonably accommodate given market conditions and current build-out of vacant or underdeveloped lands assuming Comprehensive Plan zoning. The projected land uses correspond to a year 2040 population projection of approximately 6,482 residents, which corresponds to a 16 percent growth through the planning horizon. Employment growth was also assumed to occur proportionately to population growth at 16 percent.

A summary of the existing land use estimates and future projections for the entire Tillamook UGB is listed in Table 1. Detailed land use growth by TAZ is included in the appendix.

TABLE 1. TILLAMOOK UGB LAND USE SUMMARY

Land Use / Growth Category	Existing 2017 Quantities	Total Growth 2017 to 2040	Future 2040 Quantities
Population	5,569	913 (+16%)	6,482
Households	2,299	377 (+16%)	2,676
Employees			
Retail	728	119 (+16%)	847
Service	2,075	340 (+16%)	2,415
Education	200	33 (+17%)	233
Other	1,141	187 (+16%)	1,328
Total	4,144	679 (+16%)	4,823

Travel Demand

Travel demand on roadways and at intersections in Tillamook was estimated using the ODOT APM V2 methodology for the enhanced zonal cumulative analysis method(EZCA). This methodology included estimating all vehicle trips (not just growth increment), adjusting the trip distribution to reduce household-to-household trips, and using Visum modeling software to perform the trip assignment. Travel forecasting was performed for the 30th highest hour conditions for both 2017 and 2040. The purpose of the 2017 forecast tool was to calibrate the network in preparation for developing the 2040 network, which would then be used for future analysis.

The travel demand analysis includes the translation of City land use information into motor vehicle trips. This was done for each of the TAZs based on the existing and projected land uses described previously in the Land Use section of this memorandum. Trips traveling to and from the external TAZs were also estimated for both the 2017 and 2040 analysis years. This section of the memorandum describes the methodology used to determine the different trip types and how the trips were distributed and assigned to the roadway network.

Trip Types

Travel forecast projections involve the determination of three distinct types of trips, which are categorized based on whether their origin and/or destination (i.e., the trip ends) are internal or external to the Tillamook UGB. The three trip types and how they apply to Tillamook are:

- **External-External (E-E) Trips** do not have an origin or destination in Tillamook and either do not stop or only make a very minor stop while passing through the Tillamook UGB. These trips are typically referred to as “through traffic.” An example would be a traveler from Portland traveling on OR 6 to US 101 while heading to Pacific City.
- **Internal-External (I-E) Trips** originate in Tillamook and are traveling to a location outside of the Tillamook UGB (e.g., someone working in Tillamook that returns north to Bay City in the evening), while **External-Internal (E-I) Trips** originate outside of the Tillamook UGB and are traveling to a location within Tillamook (e.g., someone from Pacific City traveling into Tillamook for shopping).
- **Internal-Internal (I-I) Trips** travel from one location within the Tillamook UGB to another location within the UGB. An example would be a person traveling between their office and home within Tillamook.

External Trip Ends

External trip ends are the origin and/or destination of E-E, I-E, or E-I trips and were estimated for both 2017 and 2040 and for 30th highest hour conditions at each of the gateways.

The number of 2017 external trip ends was based on existing traffic volumes at key gateways to the city, Bluetooth data (collected from electronic devices such as laptops or cell phones) was collected at the following four primary gateways to the city:

- a) North: US 101, north of Latimer Road
- b) South: US 101, south of McCormick Loop/Nielen Road
- c) East: OR 6 east of Olson Road
- d) West: OR 6 at Track River bridge

The Bluetooth data was used to determine the portion of through traffic compared to the portion of traffic with either an origin or destination within Tillamook. The regional travel patterns and trip types are summarized in Table 2.

TABLE 1. REGIONAL TRAVEL PATTERNS OBSERVED AT EXTERNAL GATEWAYS

Gateway	Percent Entering Traffic		Percent Exiting Traffic	
	With a Destination in Tillamook	With an External Destination	With an Origin in Tillamook	With an External Origin
North: US 101 north of Latimer Rd	69%	31%	64%	36%
South: US 101 south of McCormick Loop/Nielsen Rd	65%	35%	63%	37%
East: OR 6 east of Olson Rd	49%	51%	27%	73%
West: OR 131 at Trask River Bridge	70%	30%	71%	29%
Average of All Gateways	63%	37%	56%	44%

Source: Bluetooth data collected over a three-day period

Table 2 indicates that majority of trips entering or leaving Tillamook from one of the external gateways either begin or end within Tillamook. Approximately 30 to 40 percent of the external gateway trips are regional trips that travel through Tillamook. The exception is the east gateway of OR 6, which has a larger portion of regional traffic that passes through Tillamook.

The external trip ends that have an internal pair are modeled to pair with the internal trip ends of corresponding land uses within the city (e.g., housing and employment). This modeling process is explained further in the “Trip Distribution” section of this memorandum.

Growth estimates were applied to each gateway to determine 2040 external trip ends for through traffic. The ODOT 2035 Future Volume Tables provided data for estimating future growth. The annual growth rates and associated growth factors for each external gateway are shown in Table 3.

TABLE 3. EXTERNAL GATEWAY GROWTH FORECASTS FOR TILLAMOOK

Gateway	Annual Growth Rate	Growth Factor (2017 to 2040)
US 101, north of Latimer Rd	0.0004%	1.01
US 101, south of McCormick Loop/Nielsen Rd	0.002%	1.06
OR 6, east of Olson Rd	0.005%	1.13
OR 131 at Trask River Bridge	0.003%	1.08

Source: ODOT Future Volume Tables, Calculated annual growth forecasts

As listed in Table 3, traffic volumes at external gateways are expected to grow by one to 13 percent between 2017 and 2040. The highest growth rates are expected east of the city, which is representative of the large proportion of traffic traveling to and from the Portland metropolitan region.

Internal Trip Ends

The number of internal trip ends in Tillamook was determined using a land use-based trip generation methodology, which translates land use quantities (number of dwelling units or number of employees) into vehicle trip ends (number of vehicles entering or leaving a TAZ) based on empirically-derived trip generation rates. Weekday PM peak hour trip generation rates used in the forecast tool are listed in Table 4 for the applicable land uses. These rates were generally developed based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual* and calibrated to observed traffic counts in Tillamook.

TABLE 4. AVERAGE WEEKDAY PM PEAK HOUR TRIP GENERATION RATES BY LAND USE

Land Use	Trips In	Trips Out	Total Trip Ends
Single-family households (per dwelling unit)	0.50	0.30	0.80
Multi-family households (per dwelling unit)	0.40	0.20	0.60
Retail (per employee)	1.88	2.12	4.00
Service (per employee)	0.66	0.84	1.50
Education (per employee)	1.44	1.56	3.00
Other (per employee)	0.05	0.25	0.30

Source: DKS Associates

By applying these trip generation rates to the TAZ land uses, the number of trips entering and exiting each TAZ in Tillamook was estimated. Internal trip estimates were obtained for both the existing 2017 land uses and the projected 2040 land uses.

Trip Distribution

Trip distribution was performed to estimate how many trips travel between each of the internal and external TAZs. The external trips passing through Tillamook were distributed based on the Bluetooth data discussed previously in the External Trip Ends section of this memorandum. Distribution for trips traveling to and from internal zones (i.e., trips having at least one internal trip end) was based on weighting the attractiveness of each zone, as measured by the number of trip ends generated by the zone.

The forecasting model is based on a trip table that describes the internal and external trip ends for each trip within the network. To develop this trip table, External-to-External (E-E) trips are matched based on the external trip probabilities. Next, all remaining external trips (I-E and E-I) are paired with appropriate internal trip ends. These trips represent the inbound and outbound travel for Tillamook residents and employees, respectively. Finally, the Internal-Internal (I-I) trip pairs are determined based on the land uses within Tillamook.

Trip Assignment

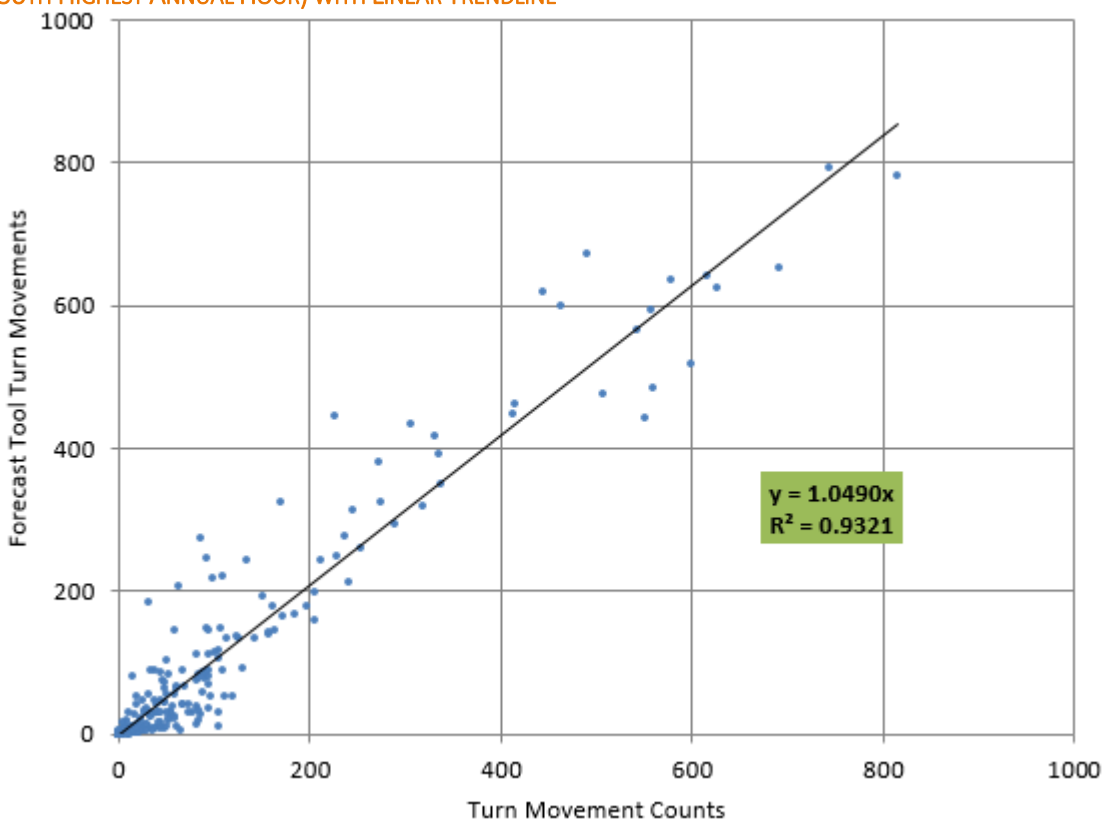
Trip assignment involves the determination of the specific travel routes taken by the trips within the transportation network. This step was performed using Visum modeling software. Forecast tool inputs included the transportation network (i.e., road and intersection locations and characteristics, as

determined from maps and field inventories) and a trip distribution table (described in prior sections). Iterated equilibrium assignment was then performed using estimated travel times along roadways and delays at intersection movements.⁴ The path choice for each trip was based on minimal travel times between locations. Forecast tool outputs include traffic volumes on roadway segments and at intersections.

Calibration

Calibration was performed on the 2017 base year forecast tools by comparing forecast tool turn volumes at the Tillamook TSP study intersections with actual counted (measured) 2017 traffic volumes. A plot comparing the measured traffic volumes and the base year forecast tool volumes for all study intersection turn movements was analyzed to evaluate the accuracy of each forecast tool, as shown in Figure 2.

FIGURE 2. 2017 FORECAST TOOL VS. ACTUAL MEASURED TRAFFIC TURN MOVEMENTS (30TH HIGHEST ANNUAL HOUR) WITH LINEAR TRENDLINE



The slope of the fitted curve is 1.05, indicating that the forecast tool volumes slightly overestimate the actual counts by 5% on average and that the trip generation rates applied are generally appropriate.

⁴ Roadway travel times were calculated based on distance and travel speed. Intersection movement delays were calculated using Highway Capacity Manual (HCM 2000) methodology for signalized and unsignalized intersections. Detailed lane geometry, traffic control, roadway cross-section, and roadway travel speed information was applied for model accuracy.

Furthermore, the R^2 value is 0.93, indicating that the forecast tool volumes are consistent with the actual volumes.

The calibration analysis for the 2017 base year forecast tools indicates that the forecast tools reasonably predict trip patterns and volumes. Therefore, the 2040 future year forecast tools are expected to reasonably forecast future year traffic volumes for the following reasons:

- The 2040 future year forecast tools were created using the 2017 base year forecast tools as a starting point.
- There are no expected roadway network changes or improvements that would significantly alter travel patterns.
- Future land use projections for the year 2040 were prepared using methodology consistent with the 2017 base year land use estimates.

Forecast Tool Volumes and Post-Processing

Forecast tool traffic growth plots (2040 minus 2017) for the design hour forecast tool are included in the appendix. While the travel demand forecast tools were calibrated to local conditions and volumes, raw volumes from the tools are not used for capacity analysis. Rather, motor vehicle turn movement volume forecasts were developed using post-processing methods consistent with the ODOT APM V2. This approach is derived from methodologies outlined in the National Cooperative Highway Research Program (NCHRP) Report 765, *Analytical Travel Forecasting Approaches for Project-Level Planning and Design*.

The post-processing methodology involves estimating trip growth at the intersection approach level (i.e., volume differences between base and future forecast tools), scaling the growth by the number of forecast years (i.e., forecast years divided by difference in forecast tool years), and adding these volumes to existing traffic counts. Engineering judgment is used as part of the post-processing methodology, with the routing decisions identified by the forecasting tool serving as a reference for making volume adjustments. The results of this process are future year forecasts derived from the Tillamook enhanced cumulative analysis forecasting tool that are calibrated to observed data. The year 2040 traffic volume forecasts (attached in Table A1) will serve as a future base volume forecast from which future conditions will be evaluated in subsequent memoranda.

The 2040 traffic forecasts resulting from the land use forecasts (Figures A1 and A2) and the model assignment (Figure A3) indicate that the primary areas for traffic growth are along 3rd Street and US 101. 3rd Street connects the residential areas on the eastern side of Tillamook with the downtown area, while US 101 connects to commercial areas along the highway frontage.

Attachments:

- Figure A1 – Household Growth by TAZ
- Figure A2 – Employment Growth by TAZ
- Figure A3 – Raw Forecast Tool Traffic Growth

- Table A1 – Study Intersection Post Processed Turn Movement Volumes – 2040 30 HV

FIGURE A1. HOUSEHOLD GROWTH (2017 TO 2040) BY TAZ

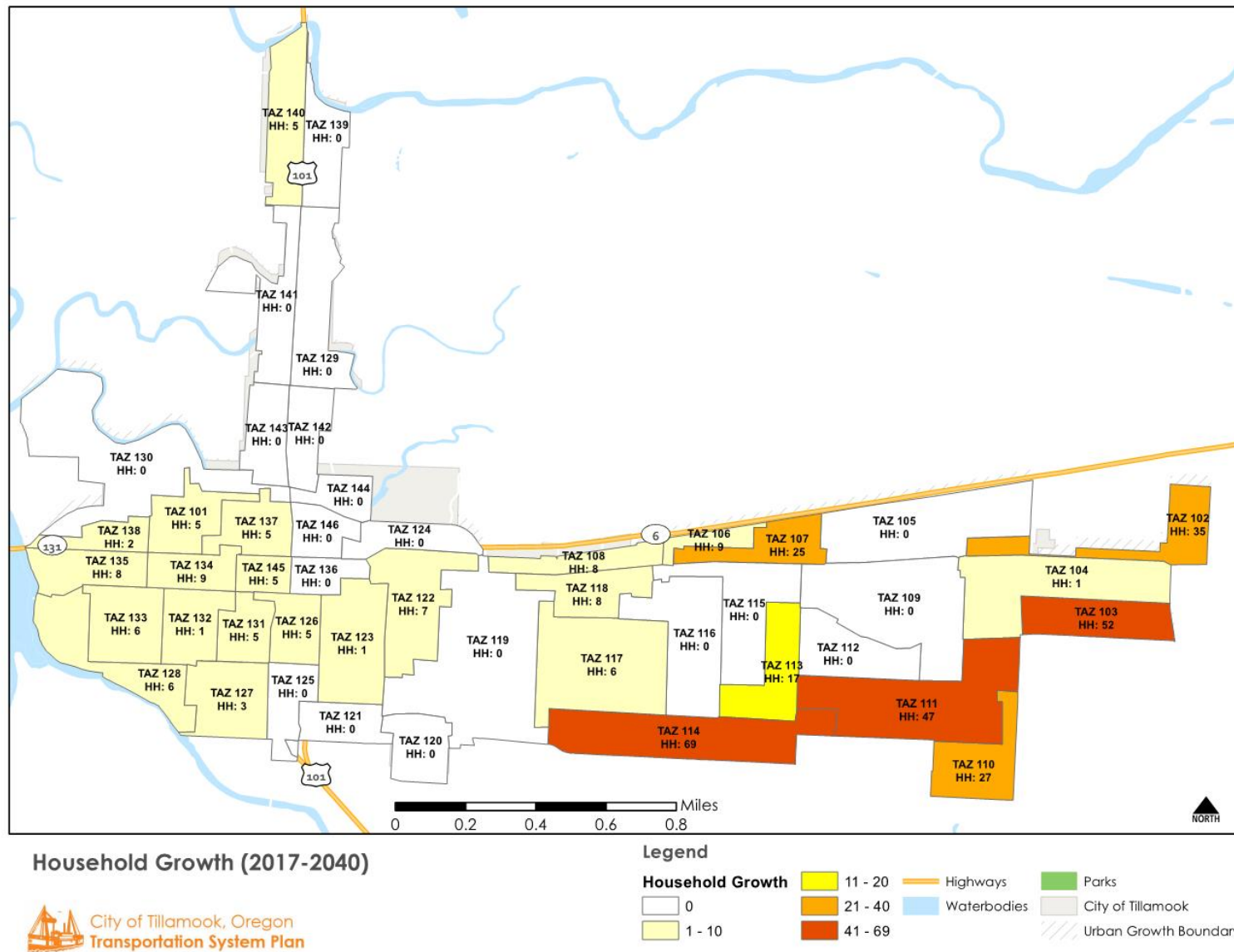


FIGURE A2. EMPLOYMENT GROWTH (2017 TO 2040) BY TAZ

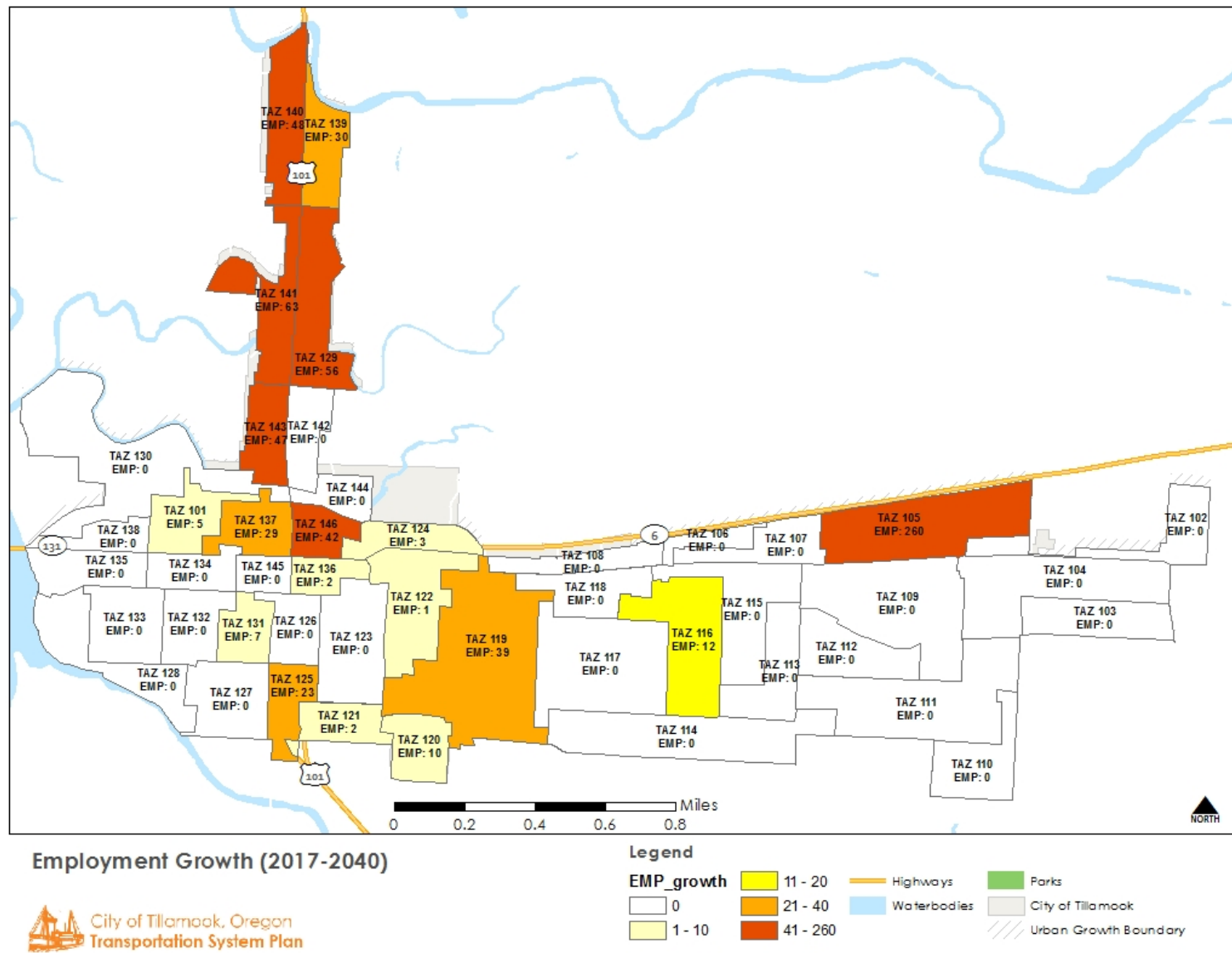


FIGURE A3. RAW MODEL TRAFFIC GROWTH (2040 MINUS 2017)



TABLE A1. POST-PROCESSED 2040 30 HV STUDY INTERSECTION TRAFFIC VOLUMES

ID	N/S	E/W	Northbound			Southbound			Eastbound			Westbound		
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	US 101	Wilson River Loop	275	635	40	55	645	30	110	45	180	80	60	40
2	US 101 (Main Ave)	Front St	0	0	0	0	960	220	0	0	10	0	0	0
3	US 101 (Main Ave)	OR 6 WB (1st St)	0	0	0	20	905	60	0	95	95	170	100	0
4	US 101 (Pacific Ave)	OR 6 WB (1st St)	50	690	0	0	0	0	120	0	0	0	225	315
5	US 101 (Main Ave)	OR 6 EB (3rd St)	0	0	0	365	650	125	0	375	45	0	0	0
6	US 101 (Pacific Ave)	OR 6 EB (3rd St)	0	565	115	0	0	0	180	580	0	0	0	0
7	US 101 (Main Ave)	4th St	0	0	0	35	630	25	0	130	60	120	145	0
8	US 101 (Pacific Ave)	4th St	50	565	25	0	0	0	75	90	0	0	215	60
9	US 101 (Main Ave)	11th St	0	0	0	85	595	5	0	30	5	50	30	0
10	US 101 (Pacific Ave)	11th St	10	445	75	0	0	0	20	100	0	0	75	65
11	Wilson River Loop N	OR 6	0	0	0	120	0	65	110	210	0	0	190	100
12	Wilson River Loop S	OR 6	35	0	110	0	0	0	0	220	30	95	175	0
13	Stillwell Ave	OR 131 (3rd St)	90	60	25	60	95	35	15	375	65	25	110	0
14	Marolf Loop Rd	3rd St	90	0	50	0	0	0	0	385	110	55	400	0
15	Evergreen Dr	12th St	0	0	0	35	0	115	115	45	0	0	40	20
16	Evergreen Dr	Alder Ln	0	60	80	145	120	0	0	0	0	80	0	100
17	Evergreen Dr	3rd St	135	0	25	0	0	0	0	445	240	45	430	0
18	Miller Ave	11th St	120	25	0	0	60	15	15	0	170	0	0	0
19	Miller Ave	3rd St	5	0	35	0	0	5	0	625	15	60	305	0
20	Stillwell Ave	9th St	20	95	0	5	105	15	10	35	10	0	40	5

Appendix G

Future Needs



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Future Transportation Conditions and Needs – REVISED DRAFT Technical Memorandum #7

February 9, 2018

Prepared for: Paul Wyntergreen, City of Tillamook

Copy to: Ken Shonkwiler, ODOT

Prepared by: Eddie Montejo, CH2M
Ryan Farncomb, CH2M
Garth Appanaitis, DKS
Amanda Deering, DKS

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Introduction

This memorandum describes future deficiencies and needs for all travel modes in the City of Tillamook in accordance with ODOT-approved transportation system analysis methodology. Future system deficiencies address each modal element of the City's transportation system and include missing links, operational deficiencies, geometric deficiencies, and safety needs using a 2040 planning horizon. Future needs are determined using the traffic forecasts developed in *Technical Memo #6: Future Conditions*. Future conditions analysis acknowledges transportation improvements in adopted plans with committed funding sources such as the Statewide Transportation Improvement Program (STIP) or Capital Improvements Program (CIP). This draft memorandum will be revised based on City of Tillamook, Project Advisory Committee (PAC), and public input.

Future Growth

Future Population and Employment

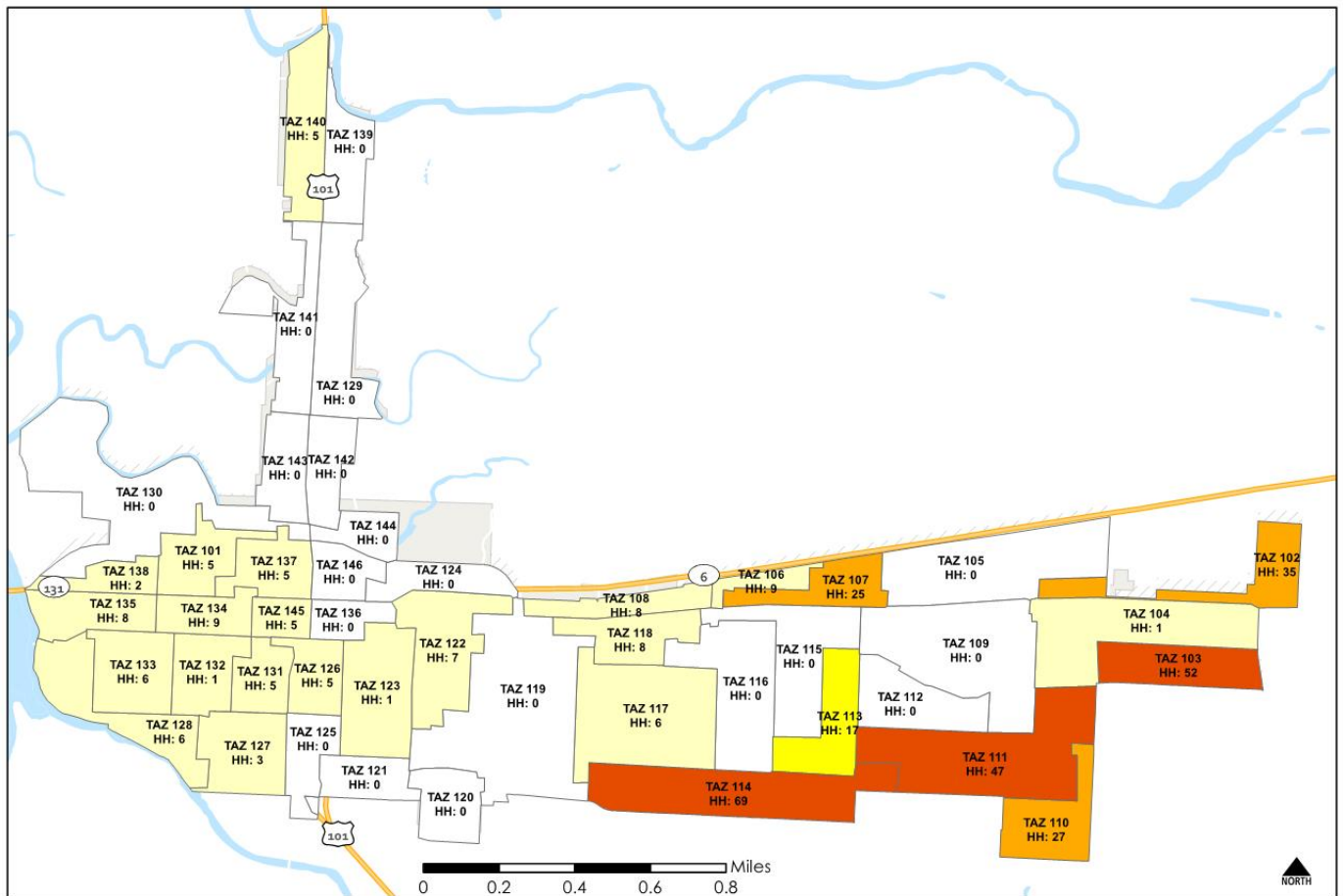
The current population of the Tillamook Urban Growth Boundary (UGB) is 5,569, based on Portland State University Population Research Center estimates (The UGB is larger than the city limits). The population of Tillamook is expected to grow by about 16% over the next 23 years, yielding a population of approximately 6,482 people. Employment in the city is assumed to grow proportionally with population growth from 4,144 jobs in 2017 to 4,823 jobs in 2040. Table 1 summarizes the existing population and employment estimates and future projections for the entire Tillamook UGB.

TABLE 1. TILLAMOOK URBAN GROWTH BOUNDARY LAND USE SUMMARY

Land Use / Growth Category	Existing 2017 Quantities	Future 2040 Quantities	Total Growth 2017 to 2040
Population	5,569	6,482	913 (+16%)
Households	2,299	2,676	377 (+16%)
Employees			
Retail	728	847	119 (+16%)
Service	2,075	2,415	340 (+16%)
Education	200	233	33 (+17%)
Other	1,141	1,328	187 (+16%)
Total	4,144	4,823	679 (+16%)

Figure 1 and Figure 2 show the forecasted household and employment growth within the Tillamook UGB by traffic analysis zone (TAZ). The 2040 traffic forecasts resulting from these land use forecasts and the model assignment indicate that the primary areas for traffic growth are along 3rd Street and US-101. OR-6/3rd Street connects the residential areas on the eastern side of Tillamook with the downtown area, while US-101 connects to commercial areas along the highway frontage.

FIGURE 1. HOUSEHOLD GROWTH (2017 TO 2040) BY TAZ



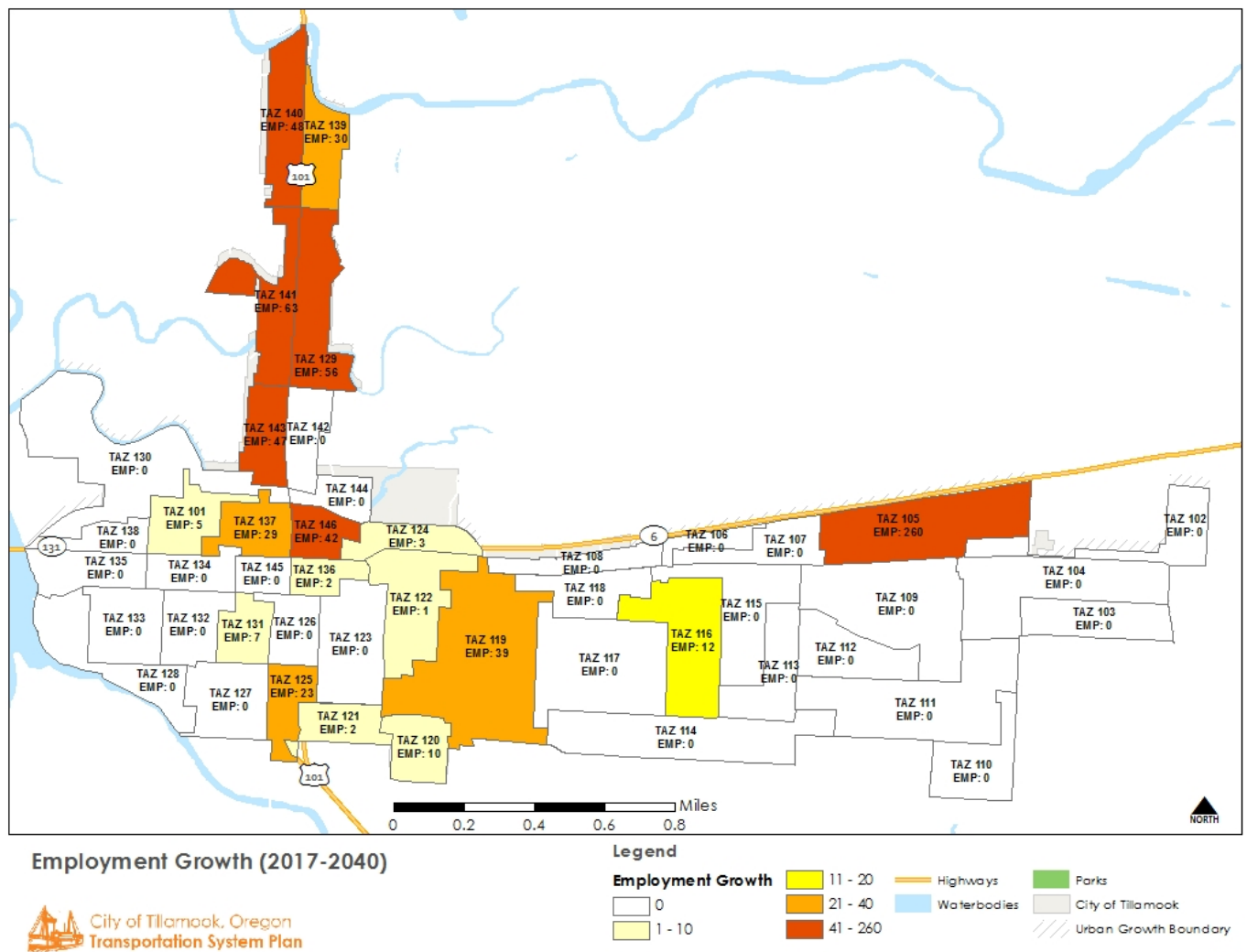
Household Growth (2017-2040)

 City of Tillamook, Oregon
Transportation System Plan

Legend

Household Growth		Highways	Parks
0	11 - 20	Waterbodies	City of Tillamook
1 - 10	21 - 40	Urban Growth Boundary	
	41 - 69		

FIGURE 2. EMPLOYMENT GROWTH (2017 TO 2040) BY TAZ



Needs and Deficiencies

The following sections describe current and anticipated transportation system needs and deficiencies, organized by mode. Future system needs are described in the context of missing links, operational deficiencies, geometric deficiencies, and safety needs.

Roadway Needs and Deficiencies

The following section summarizes the deficiencies and needs of various roadway elements as they relate to vehicle travel in Tillamook, including intersection operations, network connectivity, roadway geometry, safety, access management, and pavement conditions.

Operational Deficiencies

Future (2040) PM peak hour traffic operations were evaluated at 20 study intersections for the seasonal summer peak (30HV). All operations for unsignalized intersections were evaluated using the 2010 Highway Capacity Manual (HCM) methodology, while operations for signalized intersections were evaluated using methodology outlined in the 2000 HCM. Table 2 reports the future operational results for each signalized intersection and the results for the critical movement at both the major and minor approaches for each unsignalized intersection.

TABLE 2. FUTURE 2040 PM PEAK HOUR (30 HV) TRAFFIC OPERATIONS ANALYSIS

No.	Intersection Name	Control	Standard	LOS	V/C Ratio
1	US-101/Wilson River Loop	Signalized	V/C = 0.80	B	0.59
2	US-101 SB (Main Ave)/Front St ¹	Two-way stop	V/C = 0.90	B	0.03
3	US-101 SB (Main Ave)/OR-6 WB (1st St)	Signalized	V/C = 0.95	C	0.61
4	US-101 NB (Pacific Ave)/OR-6 WB (1st St)	Signalized	V/C = 0.95	C	0.51
5	US-101 SB (Main Ave)/OR-6 EB (3rd St)	Signalized	V/C = 0.95	B	0.56
6	US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	Signalized	V/C = 0.95	B	0.52
7	US-101 SB (Main Ave)/4th St	Signalized	V/C = 0.95	B	0.41
8	US-101 NB (Pacific Ave)/4th St	Signalized	V/C = 0.95	B	0.45
9	US-101 SB (Main Ave)/11th St ¹	Two-way stop	V/C = 0.95	C	0.29
10	US-101 NB (Pacific Ave)/11th St ¹	Two-way stop	V/C = 0.95	C	0.30
11	Wilson River Loop North/OR-6	Two-way stop	V/C = 0.75	A/C	0.09/0.37
12	Wilson River Loop South/OR-6	Two-way stop	V/C = 0.75	A/B	0.09/0.25
13	Stillwell Ave/OR-131 (3rd St)	All-way stop	V/C = 0.95	C/B	0.75/0.35
14	Marolf Loop Rd/3rd St	Two-way stop	V/C = 0.85	A/E	0.07/0.67
15	Evergreen Dr/12th St	Two-way stop	V/C = 0.85	A/B	0.11/0.26
16	Evergreen Dr/Alder Ln	Two-way stop	LOS D	A/C	0.16/0.54
17	Evergreen Dr/3rd St	Two-way stop	LOS D	A/F	0.07/ 1.31
18	Miller Ave/11th St	Two-way stop	LOS D	A/B	0.11/0.27
19	Miller Ave/3rd St	Two-way stop	LOS D	A/C	0.08/0.13
20	Stillwell Ave/9th St	Two-way stop	LOS D	A/B	0.01/0.22

¹ For two-way stop controlled intersections with one-way major approaches, only the minor movement is reported

For unsignalized intersections the worst movement for the major and minor approach are reported

Red text denotes that the intersection does not meet the mobility target.

The intersection of Evergreen Drive and 3rd Street has a level of service (LOS) F, which exceeds the mobility target of LOS D for a City minor approach. The critical movement at this intersection is the northbound left turn movement. Under existing conditions this intersection approach operates at LOS E, with a v/c ratio of 0.58, which would increase with traffic growth projected to occur along 3rd Street. All other study intersections meet mobility targets under both existing and 2040 conditions.

Street Network Deficiencies

The street network was reviewed to identify potential gaps in the roadway network. Gaps may exist due to topography, existing development, and the general layout of the City. In general, arterial spacing of approximately one-mile, collector spacing of approximately half-mile, and additional connectivity provided by lower level streets provides an ideal street system in terms of mobility and connectivity.

In Tillamook, US-101 provides primary north-south connectivity. Other important north-south routes include Stillwell Avenue, Miller Avenue, Evergreen Drive, McCormick Loop, Trask River Road, and Marolf Loop Road. OR-6/OR-131, 1st Street, 3rd Street, and 12th Street are the primary east-west routes. Due to existing development between downtown and the eastern part of the city, east-west connectivity is limited. Figure 3 below shows areas of connectivity needs in the street network. Needs are summarized below:

1. **Through Route Gap:** The network southwest of downtown lacks a defined through route (minor collector). Current local through routes are 9th Street and Cedar Avenue.
2. **East-West Connectivity Gap:** The network east of downtown lacks a major collector east-west route. Ideally, it should be spaced approximately within a half-mile from the nearest arterial, 3rd Street. The existing alignment of 12th Street meets the spacing threshold, but the facility is classified as a minor collector, and a gap exists between Marolf Loop Road and McCormick Loop.
3. **Missing Roadway Connection:** There is a roadway connectivity gap on 12th Street between Miller Avenue and US-101 (Pacific Avenue). Such a connection would provide a direct collector connection between downtown and the east side of town. However, due to topography, wetlands, and Holden Creek, such a connection in direct alignment with 12th Street is not feasible. This location is targeted for a pedestrian connection. Alternate roadway improvements may be considered to fill this connectivity need.
4. **Downtown Connectivity Gap:** There is a connectivity gap between downtown and eastern Tillamook at the mill site. There is a half-mile gap in both the north-south and east-west directions.
5. **East Connectivity Gap:** There is no defined north-south collector connection from OR 6 to another east-west collector on the east side of town. There are also other minor collector east-west connectivity gaps between 3rd Street and 12th Street, e.g. between Alder Lane and Brookfield Avenue. In addition, City staff has identified specific roadway connectivity gaps in east Tillamook, shown in Figure 4 below. Future solutions for these identified segments may include street extensions to provide more complete east-west connectivity through this part of the City.

FIGURE 3. STREET NETWORK DEFICIENCIES

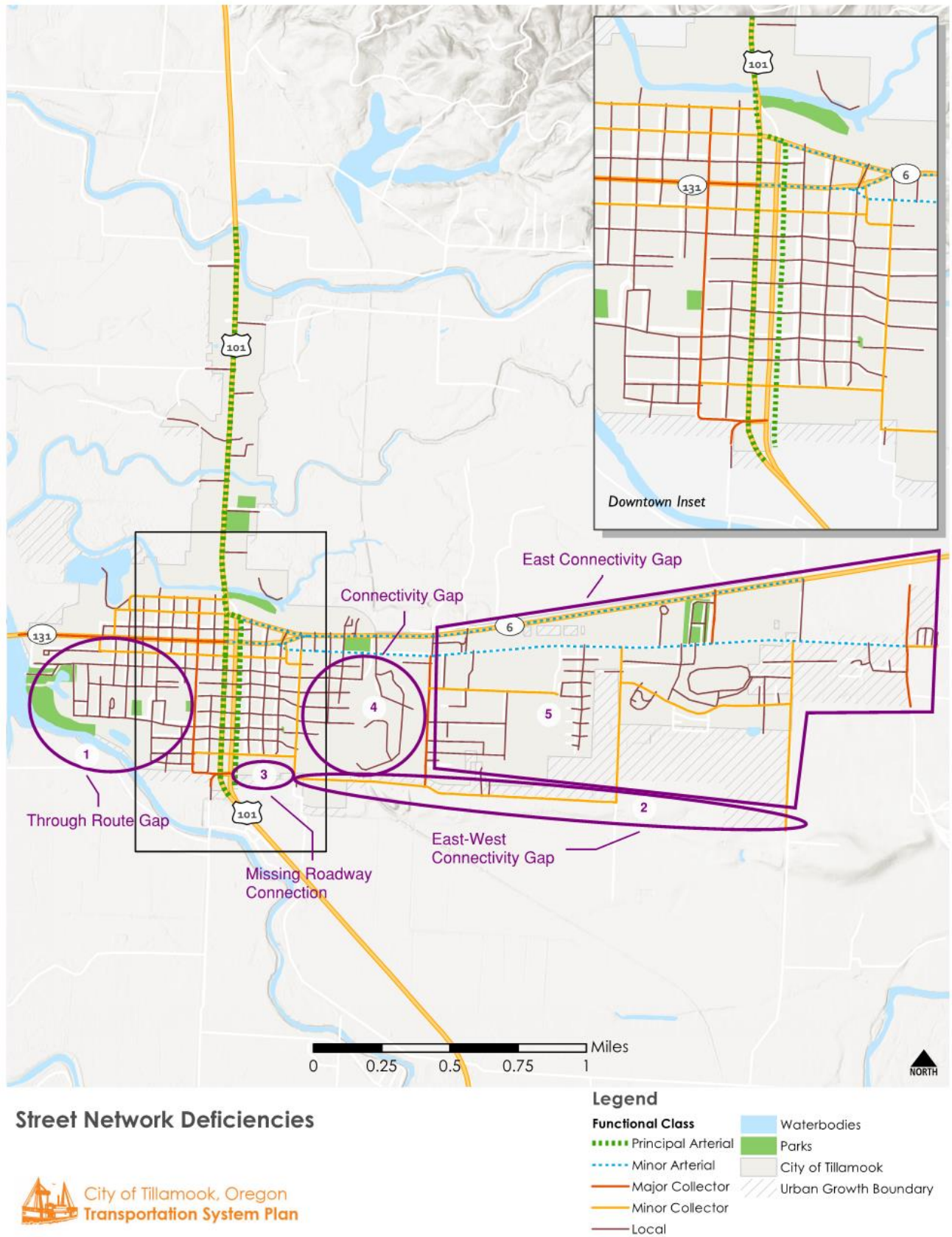
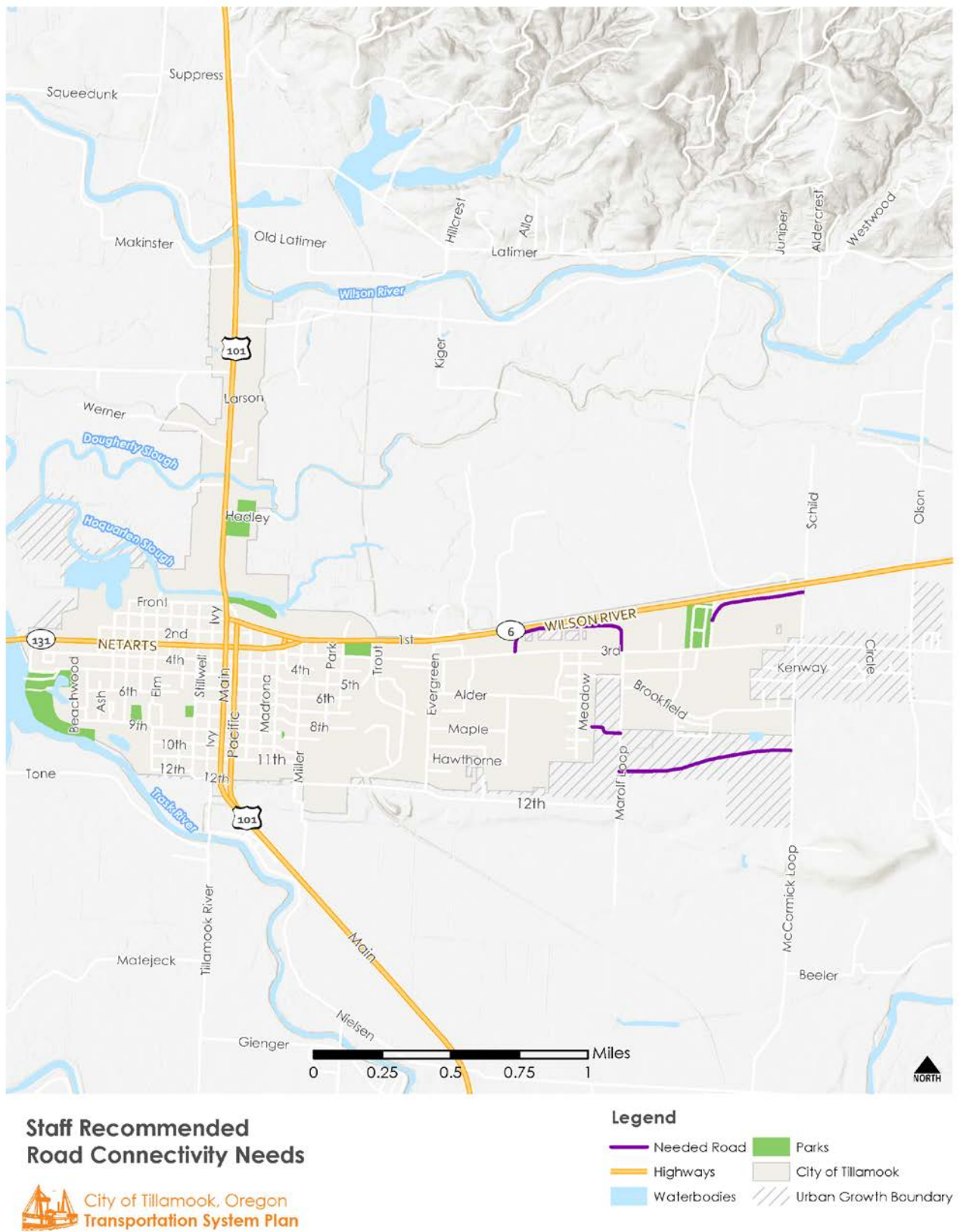


FIGURE 4. STAFF RECOMMENDED ROAD CONNECTIVITY NEEDS



Safety Needs

Several intersections and roadway segments were flagged as safety focus locations in *Technical Memo #5: Existing Conditions*. Intersections were assessed by observed crash rate and frequent crash types. A large “excess proportion” indicates a higher frequency of a certain crash type for that intersection compared to other similar intersections in the area. The following intersections are flagged as safety focus locations:

- *US-101/Wilson River Loop*: 0.18 excess proportion of turn crashes and 2015 top 10% Safety Priority Index System¹ (SPIS) location
- *US-101 SB (Main Avenue)/OR-6 WB (1st Street)*²: 0.14 excess proportion of rear-end crashes
- *US-101 NB (Pacific Avenue)/OR-6 WB (1st Street)*³: 0.23 excess proportion of turn crashes
- *US-101 SB (Main Avenue)/4th Street*: 0.34 excess proportion of angle crashes
- *US-101 (Main Avenue)/11th Street*: observed crash rate of 0.49 which is greater than the statewide 90th percentile rate of 0.41 crashes per million entering vehicles (MEV). This intersection also has a 0.42 excess proportion of turn crashes.
- *Evergreen Drive/3rd Street*: 0.25 excess proportion of turn crashes
- *Miller Avenue/3rd Street*: 0.28 excess proportion of fixed object crashes
- *Marolf Loop Road/3rd Street*: observed crash rate of 0.40 exceeds the critical crash rate for its reference population (0.48)

The following corridor segments of the highways that run through Tillamook are flagged as safety focus locations based on segment crash rates:

- US-101 (MP 64.48-64.66) near Wilson River Loop: top 10% of the 2015 SPIS rankings
- US-101 (MP 65.64-66.26) from 1st Street to South City Limits: observed crash rates of 4.1-14.98 exceed statewide average of 2.9
- OR-6 (MP 0.00-0.29) Eastbound segment of couplet: observed crash rates 5.58-14.06 exceed statewide average of 3.22
- OR-6 (MP 0.29-2.13) end couplet to Schild Road: observed crash rates 1.63-3.56 exceed statewide averages of 1.50-3.22
- OR-131 (MP 8.29-9.08) enter Urban Area to US-101/Main Street: observed crash rates 3.14-5.08 exceed statewide averages of 1.37-1.55

These corridor findings may be skewed (artificially inflated) because most segments are less than one half mile in length, which means they are disproportionately impacted by clusters of collisions near intersections⁴. Further investigation would be required to identify segments that would benefit from applying countermeasures.

¹ SPIS is a systemic scoring method that identifies potential safety problems on state highways. It is based on crash data; SPIS sites are those with a high number of crashes and/or traffic fatalities.

² This intersection is being rebuilt as part of the US-101/OR-6 Traffic Improvement Project. Countermeasures may not be necessary.

³ See previous footnote.

⁴ Oregon Department of Transportation. Analysis Procedures Manual, Version 2, Section 4.3.4 Critical Crash Rate. 2017.

Geometric Deficiencies

A high-level assessment of the typical right-of-way of arterials and collectors in Tillamook was performed to identify roadways that do not meet current street standards. This high-level review was based on the distance between the outer edges of the combined street elements (e.g., travel lane, bike lane, parking, sidewalk, landscaping, etc.) and did not review widths for each specific feature. An assessment of bike and sidewalk facilities is provided in a subsequent section. The following arterials have deficient segments based on a typical cross-section width of 76 feet (4-lane) and 52 feet (2-lane):

- US-101: Hadley Road to Front Street (some of this segment will meet standards after the US-101/OR-6 project is completed) [70 feet] [Note: Designated truck route]
- 3rd Street: from Schild Road to Olson Road [40 feet] [Note: Designated truck route]

The following collectors have deficient segments based on a typical cross-section width of 48 feet (where segment extents are not provided, assume entire length is deficient):

- OR-131 (3rd Street): west of the hospital [40 feet]
- Birch Avenue: 1st Street to 3rd Street [40-45 feet] [Note: Designated truck route]
- 12th Street: east of Tillamook High School to Marolf Loop Road [25-40 feet]
- Evergreen Drive [30-35 feet]
- Alder Lane [35-40 feet]
- Marolf Loop Road: 3rd Street to 12th Street [25-30 feet]
- Brookfield Avenue [25-30 feet]
- Wilson River Loop: 3rd Street to OR-6 [30-40 feet] [Note: Designated truck route]
- McCormick Loop Road [25-30 feet]
- Schild Road [25-30 feet]
- Olson Road: 3rd Street to OR-6 [30 feet] [Note: Designated truck route]
- Trask River Road [25-20 feet]
- 3rd Street: east of Olson Road [35 feet]

Access Management

State highways in Tillamook generally do not meet access spacing standards. This is primarily due to business development along most of the corridors prior to implementation of current access management standards. In the downtown area, there are often multiple private driveways between blocks, which can lead to vehicular and pedestrian conflicts. The City has attempted to mitigate this by abandoning accesses on Federal Emergency Management Agency (FEMA) purchased properties with multiple driveways, as well as consolidating highway access points to adjoining parcels.

The following highway segments currently do not meet access spacing standards:

- US-101: from Northern UGB Limits to Southern UGB Limits
- OR-6: from Del Monte Avenue to US-101 North
- OR-131 WB: from US-101 South to Grove Avenue

There are many developed businesses on both sides of US-101. This leads to more driveways along the highway than the standard allows. Along OR-6, the segments to the east have less access as they are less developed. As OR-6 extends to the west, it enters a residential and more commercially developed area which has more driveways and access points, both public and private. OR-131 passes through a mix of

commercial and residential development with short city blocks, which has resulted in many public street and private driveway accesses.

Infrastructure Deficiencies

Pavement Needs

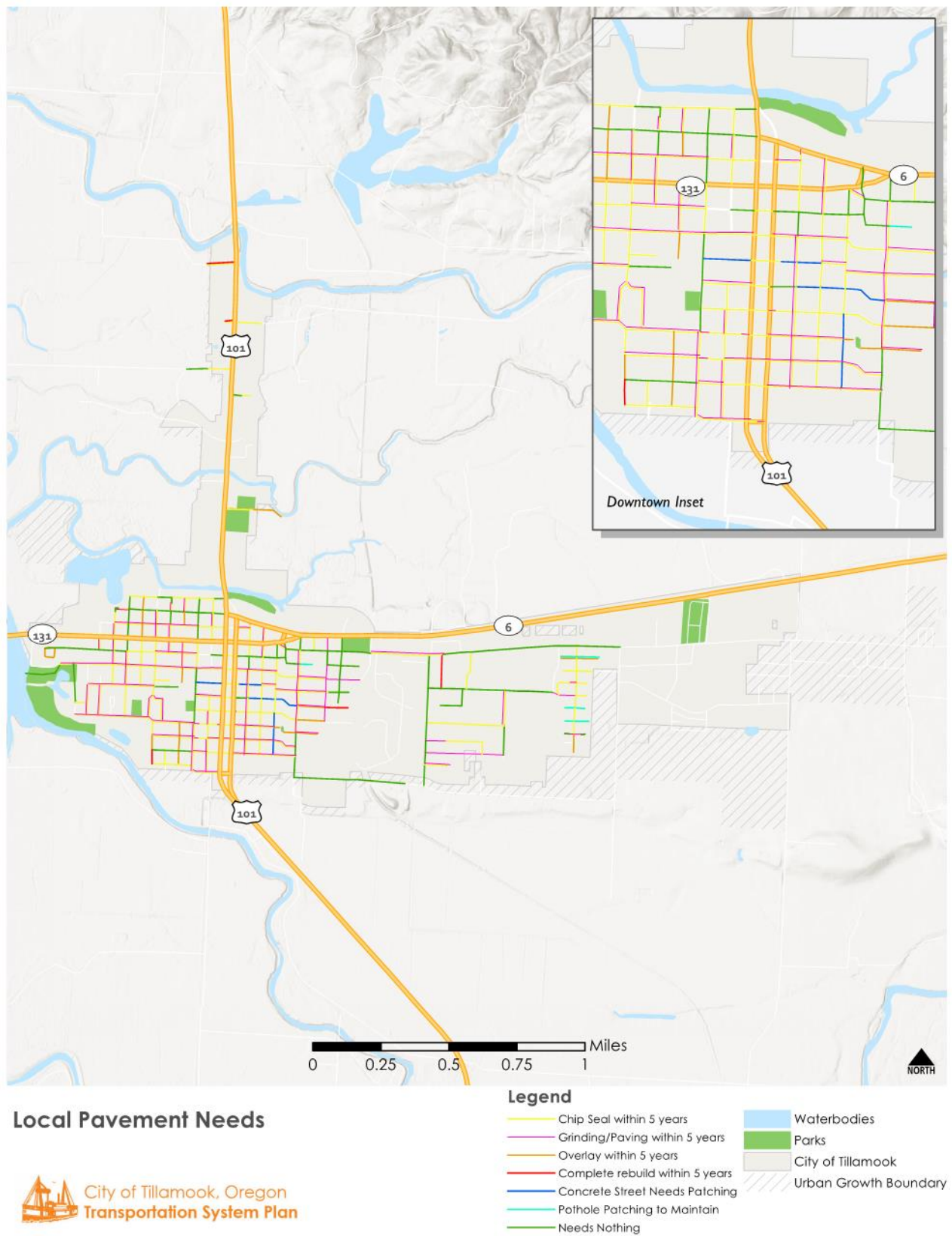
ODOT reports the pavement condition of roadways within its jurisdiction, rating them on a scale from very poor to very good⁵. Roads in fair condition have sections of patching and short sections that require maintenance. Roads in poor condition have a rough driving surface, with most of their length requiring maintenance because of potholes and cracking. Along OR-6, the segment downtown between Del Monte Avenue and Main Avenue is in poor condition. US-101 pavement condition is rated as fair along the entire segment through Tillamook, except for the northbound segment through downtown (Pacific Avenue), which is rated as poor. The current US-101/OR-6 Traffic Improvement Project will reconstruct part of the roadway, improving pavement conditions on this stretch of US-101.

Figure 5 below indicates the level of maintenance required for the local streets in Tillamook in the next five years based on a pavement condition inventory provided by the City of Tillamook⁶. A large portion of the local roadways, especially in the central downtown area, will need some level of pavement maintenance in the next several years.

⁵ ODOT. TransGIS website: Pavement Condition. <http://gis.odot.state.or.us/TransGIS/>. 2017.

⁶ City of Tillamook. Based on maps provided by Tillamook Public Works. 2017.

FIGURE 5. FUTURE PAVEMENT REHABILITATION NEEDS



Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) come in many forms and have numerous applications. In general, they include any number of ways of collecting and conveying information regarding roadway operations to agency staff managing the facility or even to motorists. This can allow both operators and motorists to make informed decisions based on real-time information, leading to quicker responses to incidents, diversion away from congestion, and increased efficiencies in roadway operation. There are no identified mobility or operation needs in Tillamook that would benefit from specific ITS system investment through 2040.

Pedestrian and Bicycle Needs and Deficiencies

This section describes pedestrian and bicycle needs and deficiencies on existing and planned roadway segments throughout the City, organized by mode. Needs were identified based on an analysis of existing and future conditions (documented in *Technical Memos #5 and #6*), and acknowledges recommendations included in the previous Tillamook TSP (2003). Needs and deficiencies are discussed in the context of missing network links, deficient crossings, and other pedestrian safety/comfort deficiencies. The needs identified in this section will serve as the basis for future solutions to support safe, accessible, and convenient multi-modal travel within the City of Tillamook.

Pedestrian and Bicycle Connectivity Needs

Needed connections for safe and convenient multi-modal travel in Tillamook are shown in Figure 6. Future solutions for these missing links are likely to include a combination of on-street facilities to close pedestrian and bicycle network gaps along collector streets near the southern portion of the City, as well as off-street shared-use facilities linking US-101, the Hoquarton Slough, and the Tillamook Creamery. Specific facility recommendations for these missing links will be described in *Technical Memo #8: Solutions Evaluation*.

As of the writing of this memorandum, the missing link along the southern perimeter of Hoquarton City Park is planned to be constructed as a shared-use path as part of the Crosstown Connections Project. The path will connect the Hoquarton Interpretive Trail and Goodspeed Park, and is also planned to provide a future connection to the Salmonberry Trail. Pedestrian and bicycle network connectivity needs are summarized in Table 3 below⁷.

⁷ Table 3 summarizes City staff identified pedestrian and bicycle connectivity needs.

TABLE 3. PEDESTRIAN AND BICYCLE CONNECTIVITY NEEDS

Location	From	To	Need
US-101 (parallel route, east of highway)	US-101 north of Hoquarton Slough	US-101 at Wilson River	Off-street path connection from Hoquarton Slough to Hadley Fields and Tillamook Creamery north of town
Southern perimeter of Hoquarton City Park	US-101 south of Hoquarton Slough	OR-6 1 st Street at Trout Street	Off-street path connection between Hoquarton Interpretive Trail, Goodspeed Park, and Salmonberry Trail
Hoquarton Slough perimeter (northwest City limits)	Front Street at Stillwell Avenue	1st Street at Birch Avenue	Shared-use loop connection around Hoquarton Slough (northwest of downtown)
12th Street extension (southern City limits)	12 th Street at US-101 NB Pacific Avenue	12 th Street at Miller Avenue	On-street pedestrian/bicycle connection between US-101 and Miller Avenue
Marolf Plaza gap	Marolf Plaza at Beech Street	Marolf Plaza at Marolf Loop Drive	On-street pedestrian/bicycle connection between Beech Street and Marolf Loop Drive
12th Street path to Maple Street	Maple Street at Williams Avenue	12 th Street west of Marolf Loop	Pedestrian/bicycle connection to residences northwest of 12 th Street at Marolf Loop and community destinations on 12 th Street
Williams Avenue gap to 12th Street	Williams Avenue at Hawthorne Lane	Williams Avenue at 12 th Street	On-street pedestrian/bicycle connection between Hawthorne Lane and 12 th Street

Sidewalk Deficiencies

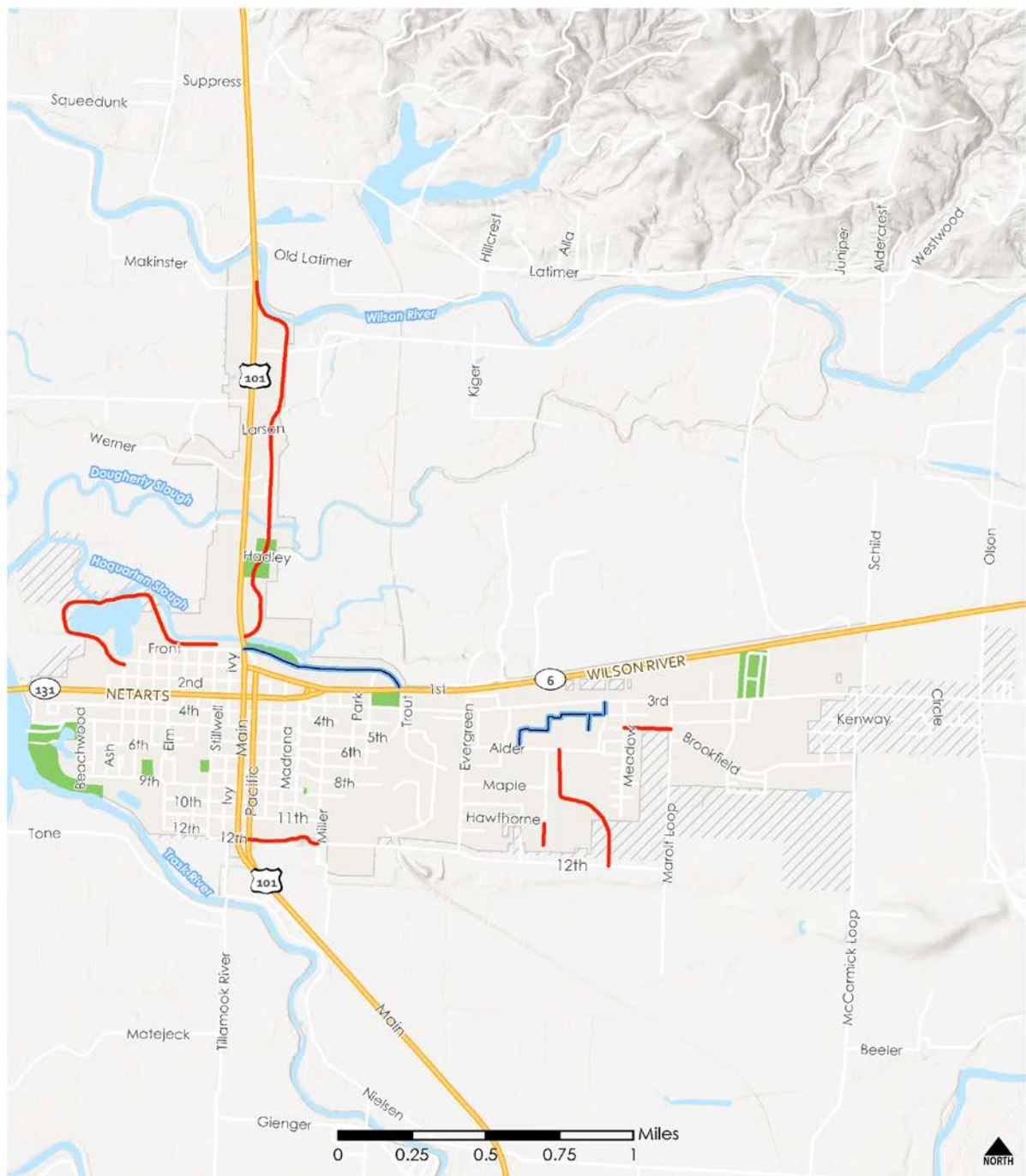
Although the sidewalk network is generally well developed within downtown Tillamook, sidewalk connectivity is inconsistent on arterial and collector streets outside of the downtown core (Figure 7). Most collector roads east of Miller Avenue currently lacks sidewalks or curb ramps. East of Miller Avenue, there are currently no sidewalks or curb ramps along OR-6 1st Street, most of 12th Street, most of Evergreen Drive, Marolf Loop Drive, Brookfield Avenue, or McCormick Loop Drive. OR 3rd Street is mostly without sidewalks east of Marolf Loop Drive. Additional sidewalk gaps on the arterial and collector network exist on one side of the street along Front and 2nd Streets, between Birch and Stillwell Avenue. Sidewalk gaps and deficiencies on one or both sides of the street are displayed in Figure 8 below.

Sidewalks are also deficient on portions of the local street network. Some neighborhoods have complete sidewalks on both sides of the street, while others do not. Where local streets are lacking sidewalks, pedestrians must share the roadway with bicyclists and vehicle traffic along narrow roadway shoulders. In more recently developed residential areas, newly constructed pedestrian facilities do not

always connect to older parts of the City, resulting in a disconnected network, requiring pedestrians to walk on paved or gravel shoulders.

Although sidewalk gaps affect pedestrian connectivity throughout the City, needs are greatest near significant pedestrian generators, such as schools, parks, and community destinations. Sidewalks are sometimes lacking in these areas, such as on the south side of 9th Street, across from Liberty Elementary School and surrounding Tillamook High School. Deficiencies near schools and community destinations can exist even when sidewalks are present. In some locations, a high number of driveways and private accesses create a barrier to safe and continuous pedestrian facilities, or sidewalks are only present on one side of the street.

FIGURE 6. PEDESTRIAN AND BICYCLE CONNECTIVITY NEEDS



Off-Street Pedestrian Connectivity



City of Tillamook, Oregon
Transportation System Plan

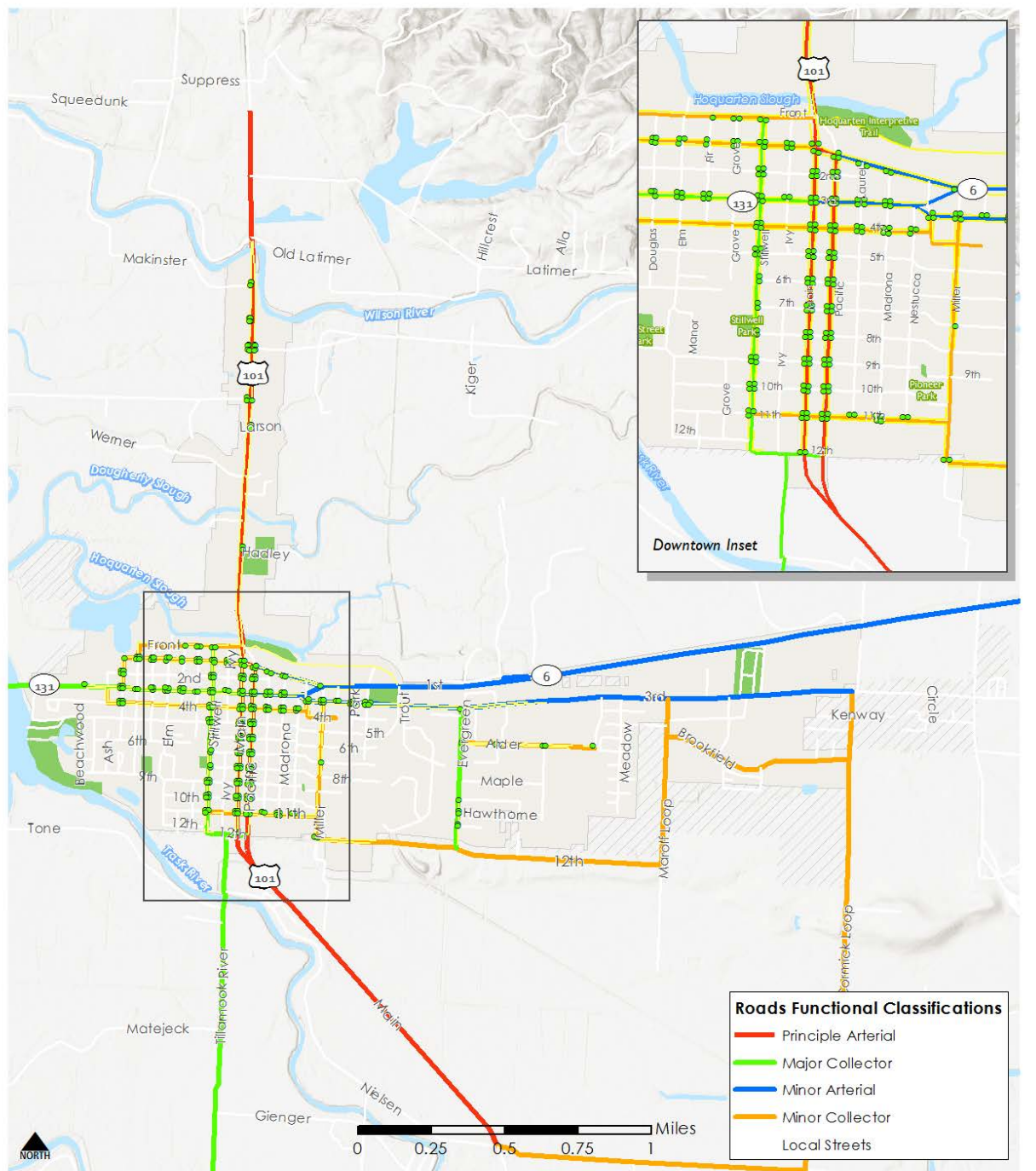
Legend

- Needed Connection
- Existing Off-Street Connection
- Highways
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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FIGURE 7. PEDESTRIAN FACILITIES - SIDEWALKS AND CURB RAMPS



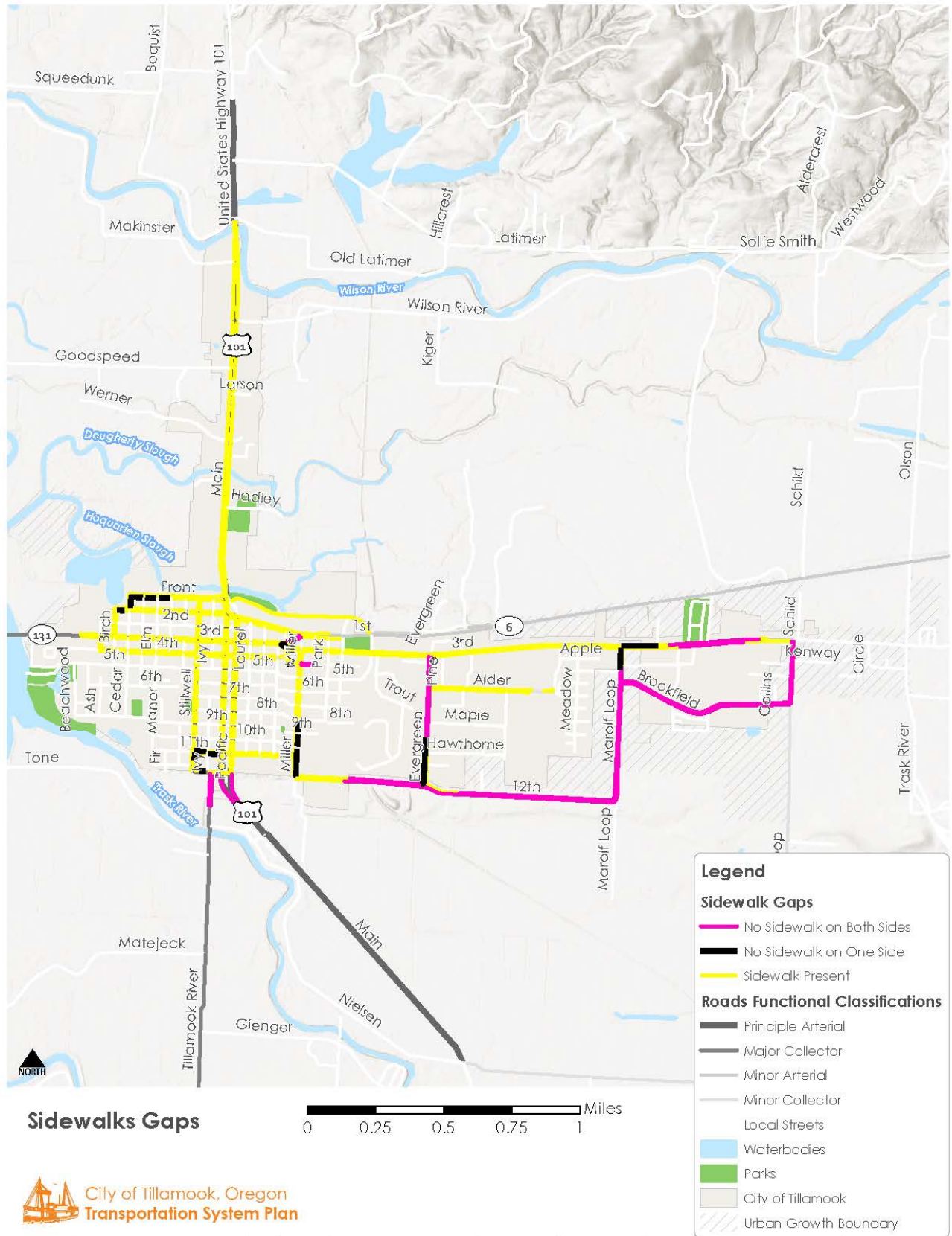
Pedestrian Facilities Sidewalks and Curb Ramps



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FIGURE 8. SIDEWALK GAPS AND DEFICIENCIES - ARTERIAL AND COLLECTOR NETWORK



Sidewalk gaps are summarized in Table 4 below.

TABLE 4. SIDEWALK GAPS

Street	From	To	Need
Pine Street	3 rd Street	Hawthorne Lane	No sidewalk on one side of the street
3rd Street	Marolf Loop	Schild Road/McCormick Loop	<ul style="list-style-type: none"> • No sidewalk on one side of the street between Marolf Loop and Tillamook Bay Community College • No sidewalk on both sides of the street between Tillamook Bay Community College and Schild Road/McCormick Loop • No sidewalk on one side of the street between Brookfield Drive and 3rd Street
Evergreen Drive	12 th Street	3 rd Street	No sidewalk on either side north of Hawthorne Lane; no sidewalk on one side south of Hawthorne Lane
12th Street	Tillamook High School	Marolf Loop Drive	No sidewalk on both sides of the street
Marolf Loop	12 th Street	Brookfield Drive	No sidewalk on both sides of the street
McCormick Loop	Brookfield Drive	3 rd Street	No sidewalk on both sides of the street
Miller Avenue intersections		See Figure 8	No sidewalk on both sides of the street

Sidewalk Conditions

Sidewalk conditions vary throughout the City. Generally, sidewalks in areas that have undergone more recent development are in better condition than sidewalks in older sections of the City. Developers are generally required to improve sidewalks, ramps, and crossings to local, county, and state standards depending on location. Sidewalk conditions are best in the vicinity of the downtown core, along US-101 SB Main and NB Pacific Avenues, and along OR-6/OR-131 1st and 3rd Streets. As of the writing of this plan, sidewalk improvements are being made on US-101, 1st, and 2nd Streets as part of the US-101 Traffic Improvement Project.

Outside of downtown, sidewalk conditions vary considerably. Several sections in east Tillamook lack sidewalks on one or both sides of the street. In other locations, sidewalks are cracked, sloped, or uneven and require repair or reconstruction.

Deficient Crossings

Pedestrian signalization, marked crosswalks, curb “bulbouts”, and curb ramps facilitate the safe and efficient movement of pedestrians. The presence of traffic signals at highway intersections varies from location to location, although pedestrian signalization is largely lacking throughout most of the City. However, based on existing and future vehicle traffic forecasts, there are minimal needs for signalized crossings at non-highway intersections.

Most of the marked crosswalks on the arterial and collector roadway network are located in the downtown core along US-101 Main and Pacific Avenues, in addition some local streets near downtown. The current condition of crosswalk markings varies from location to location. At some locations, crosswalks are marked on all intersection approaches, but the striping is faded and difficult to see. Locations with a high number of driveways and private accesses also create a barrier to continuous, connected pedestrian facilities. The City’s current crosswalk policy is to apply continental hash markings at any intersection where new paint or reapplication is needed.

As of the writing of this plan, curb “bulbouts” are present on US-101 SB Main and NB Pacific Avenues, and were recently implemented as part of the US-101 Traffic Improvement Project. Curb bulbouts shorten pedestrian crossings distance and make pedestrians waiting to cross more visible to vehicle traffic. More bulbouts are planned in some off-highway downtown locations in the Hoquarton Waterfront Plan. Bulbouts could be considered at other high vehicle traffic crossings on the arterial and collector network in Tillamook. However, bulbouts often preclude or complicate the creation of separated bicycle facilities, meaning bulbouts should be considered in context of bicycle network needs.

High-level pedestrian crossing needs are identified below; more specific facility recommendations will be identified in *Technical Memo #8: Solutions Evaluation*. For the purposes of the needs analysis, pedestrian crossing needs are organized as “basic” and “advanced” crossing needs:

- **Basic Crossing Needs** describe needs at lower vehicle traffic arterial and collector intersections. Safety concerns and/or traffic volumes are lower at these locations, and crossing improvements are likely to include restriping or completion of existing crosswalk markings, repair, or update of existing curb ramps, or signage updates.
- **Advanced Crossing Needs** describe needs at key nodes within the arterial and collector network. Safety concerns and/or traffic volumes are higher at these locations, requiring a higher level of protection for pedestrians and other vulnerable road users. Crossing improvements at these locations may augment basic crossing improvements and may include pedestrian signalization, raised crossings, curb bulbouts, and curb ramp installation or reconstruction.

Pedestrian crossing needs are summarized in Table 5 and Figure 9 below. Crossings improved as part of the US-101 Traffic Improvement Project are acknowledged in Figure 9.

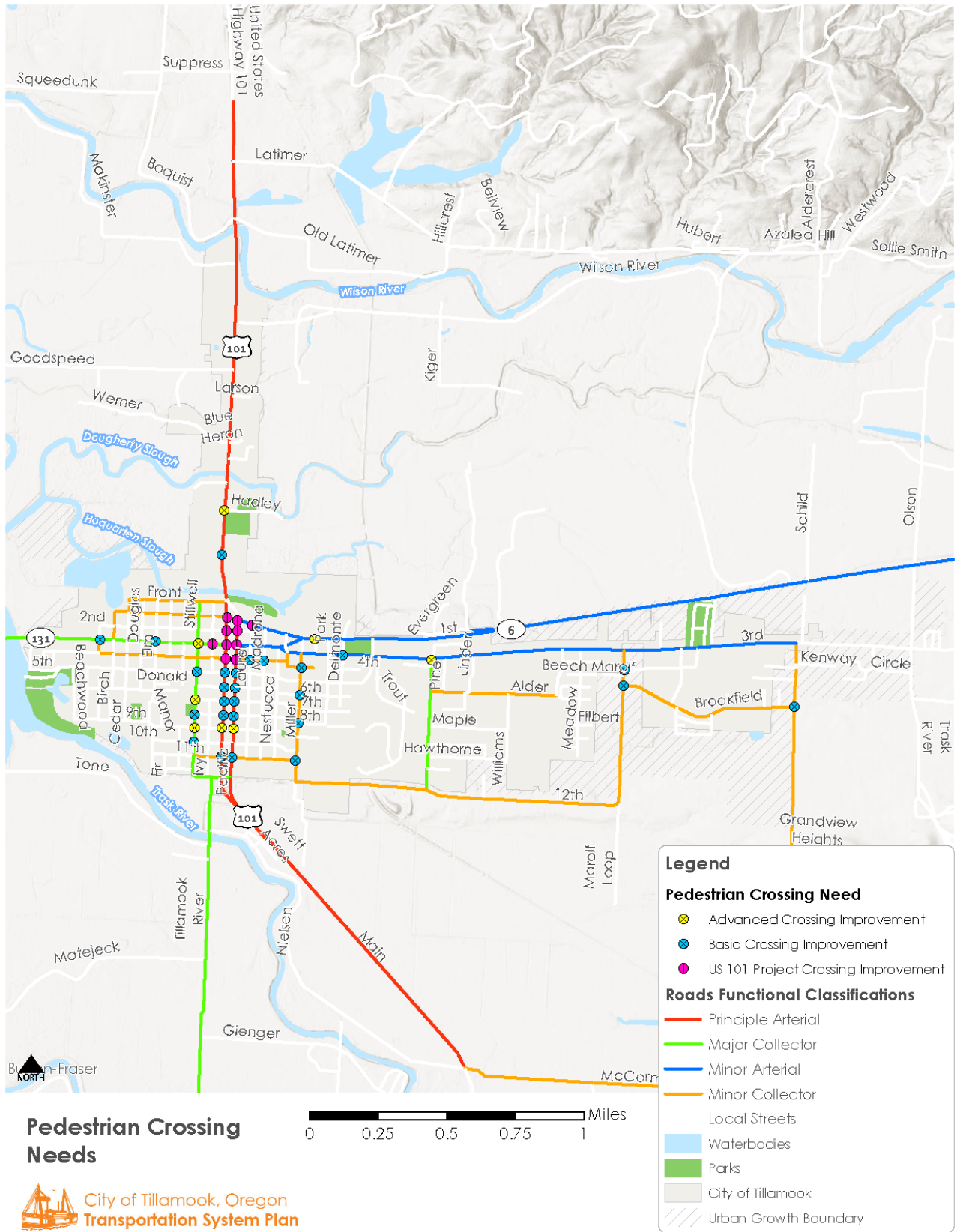
TABLE 5. PEDESTRIAN CROSSING NEEDS

Street	Notes	Need (Basic/Advanced)
OR-131/3 rd Street at Ash Avenue	Medical facility on north side of OR-131	Basic Crossing Improvement
OR-131/3 rd Street at Elm Avenue	Additional marked crossing location on OR-131	Basic Crossing Improvement

Street	Notes	Need (Basic/Advanced)
OR-6 1 st Street at Goodspeed Place	Existing marked crossing; multiple lanes of vehicle traffic at this location	Advanced Crossing Improvement
Stillwell Avenue at 5 th Street	Collector street; facilitate safe crossing to nearby school, YMCA and park	Basic Crossing Improvement
Stillwell Avenue at 8 th Street	Collector street; facilitate safe crossing to nearby school, YMCA and park	Basic Crossing Improvement
Stillwell Avenue at 10 th Street	Collector street; facilitate safe crossing to nearby school, YMCA and park	Basic Crossing Improvement
3 rd Street at Del Monte Avenue	Crossing to Goodspeed Park	Basic Crossing Improvement
4 th Street at Laurel Avenue	Minor collector crossing	Basic Crossing Improvement
4 th Street at Madrona Avenue	Minor collector crossing	Basic Crossing Improvement
US-101 Main Ave N, north of Hoquarton Slough and south of Hadley Rd N	No existing marked crossings along US-101 at this location.	Basic Crossing Improvement
US-101 Main Ave N at Hadley Rd N	No existing marked crossings along US-101 at this location.	Advanced Crossing Improvement
US-101 SB Main and NB Pacific Avenues at 5 th Street	High-traffic crossing; would improve crossing safety for students that cross US-101	Basic Crossing Improvement
US-101 SB Main and NB Pacific Avenues at 6 th Street	High-traffic crossing; would improve crossing safety for students that cross US-101	Basic Crossing Improvement
US-101 SB Main and NB Pacific Avenues at 7 th Street	High-traffic crossing; would improve crossing safety for students that cross US-101	Basic Crossing Improvement
US-101 SB Main and NB Pacific Avenues at 8 th Street	High-traffic crossing; would improve crossing safety for students that cross US-101	Basic Crossing Improvement
US-101 SB Main and NB Pacific Avenues at 9 th Street	High-traffic crossing; would improve crossing safety for students that cross US-101	Advanced Crossing Improvement
US-101 SB Main and NB Pacific Avenues at 11 th Street	High-traffic crossing; would improve crossing safety for students that cross US-101	Basic Crossing Improvement
Miller Avenue at 4 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
Miller Avenue at 6 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement

Street	Notes	Need (Basic/Advanced)
Miller Avenue at 8 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
Miller Avenue at 11 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
Evergreen Drive at 3 rd Street	Future traffic forecasts indicate significant increases in vehicle traffic at this location	Basic Crossing Improvement
Marolf Loop Drive south of 3 rd Street	Future development likely to create need for improved crossings	Basic Crossing Improvement
Marolf Loop Drive at Brookfield Drive	Future development likely to create need for improved crossings	Basic Crossing Improvement

FIGURE 9. PEDESTRIAN CROSSING NEEDS - ARTERIAL AND COLLECTOR NETWORK



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Pedestrian Lighting

Pedestrian-scale lighting can promote a safe and comfortable pedestrian environment by illuminating sidewalks, intersection crossings, and other places where pedestrians congregate such as transit stations and parks. Pedestrian lighting has also been identified as a priority in previous City planning processes, such as the Tillamook Parks and Recreation Master Plan (2013). Street lights are located on most roadways within the City, although many require upgrade, relocation, or repair. On many streets, street light poles are widely spaced, creating illumination gaps for all road users.

Despite their presence on many roadways, nearly all the City's street lights are constructed to illuminate the vehicle right-of-way as opposed to illuminating the pedestrian environment. Pedestrian-scale lighting only exists in a few locations throughout the City, and mostly within recently improved parks and community centers. In 2007, the perimeter of the Coatsville Park and adjacent streets (9th Street and Elm Avenue) received lighting updates to increase the use and safety of the park. The Tillamook Parks and Recreation Master Plan (2013) provides concept-level pedestrian lighting recommendations for all parks within the City. Additional pedestrian lighting improvements are planned as part of the Crosstown Connections Project.

There is a need to implement pedestrian-scale lighting on the arterial system within the downtown core. Pedestrian-scale lighting is also needed near all schools, parks, and community centers within the City. Opportunities also exist to enhanced pedestrian lighting within the local street network, particularly near intersections with higher speed and/or higher volume roadway facilities. Existing and planned trails also require adequate pedestrian lighting to ensure safe and comfortable use for pedestrians and bicycle riders. Specific lighting improvement recommendations will be developed in subsequent phases of the TSP update process.

Accessibility Needs

Most sidewalks in downtown Tillamook have been upgraded with curb ramps. Generally, ramps in front of newer development or commercial centers are ADA-compliant. However, some of the older ramps in downtown are not to ADA standard due to being too steep or cracked. Many sidewalks do not have ADA-compliant sidewalk ramps, although most sidewalks meet minimum ADA width and maximum slope standards. In other cases, curb ramps are not present on all intersection approaches. West of Stillwell Avenue, curb ramps are missing at some or all intersection approaches on Front Street, OR-6/OR-131 1st and 3rd Streets, and 4th Street. Curb ramps are also missing along most of OR-6/ 1st Street east of US-101 SB/ Pacific Avenue. Figure 7 above displays existing ADA curb ramps overlaid on City street functional classifications and generalized sidewalks. For information about ADA facilities on state highways, please refer to the ODOT Americans with Disabilities Act Title 11 Transition Plan Update.

East of Miller Avenue, there are currently no curb ramps along most of OR-6/OR-131 1st and 3rd Streets, 12th Street, most of Evergreen Drive, Marolf Loop Drive, Brookfield Avenue, or McCormick Loop Drive. Additional sidewalk gaps on the arterial and collector network exist on one side of the street along Front and 2nd Streets, between Birch and Stillwell Avenue.

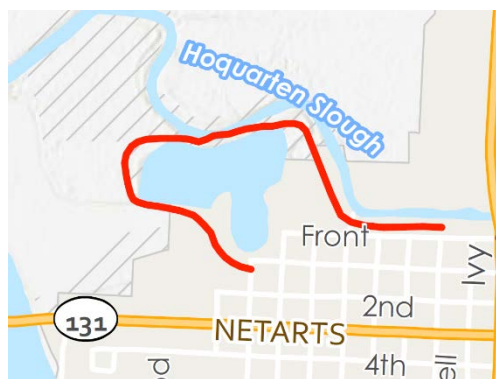
Off-Street Path and Trail Needs

City of Tillamook staff have identified needed off-street path and trail connections, as previously shown in Figure 6, and summarized in Table 6 below. One of these segments identifies a planned shared-use path linking Hoquarton Interpretive Trail and Goodspeed Park, which is under construction as of this writing as part of the Crosstown Connections Project.

Staff have also identified a need for an off-street trail connection from the northern City limits (figure to the right) to the Hoquarton Slough running parallel to US-101. This future off-street connection would need to run to the east of US-101 to provide a connection through Hadley Fields to the Wilson River, and to the Tillamook Creamery north of the City. Although specific facility recommendations for this segment will be developed as part of the TSP update process, this segment will need to provide adequate bicycle and pedestrian improvements to ensure a safe and convenience shared-use environment for all users.



Another needed off-street connection identified by City staff is a loop around Hoquarton Slough in the northwest quadrant of the City. Based on aerial imagery, the loop follows an informal path already frequently used by pedestrians and bicyclists. The loop termini are on Front Street at Stillwell Avenue and on 1st Street at Birch Avenue. As improvements are developed as part of the TSP update process, there is a need to implement safe crossings at the loop termini, as well as bicycle and pedestrian amenities on the loop itself. There will also be a need to create a shared-space environment that is adequately wide to minimize any potential collisions between active transportation users.



There is also a need to evaluate crossings accessing the Tillamook Junior High School property and the Bud Gienger Community Fitness Trail, which follows the entire perimeter of the school and connects to the City's sidewalk system. The trail features an eight-foot wide paved path as well as lighting and fitness stations located along the trail. A potentially off-street connection between the trail and 12th Street to the south is also desired.

TABLE 6. OFF-STREET PATH AND TRAIL NEEDS

Location	From	To	Need
US-101 (parallel route, east of highway)	US-101 north of Hoquarton Slough	US-101 at Wilson River	Off-street connection from Hoquarton Slough to Hadley Fields and Tillamook Creamery north of town

Hoquarton Slough perimeter (northwest City limits)	Front Street at Stillwell Avenue	1st Street at Birch Avenue	Off-street loop connection around Hoquarton Slough (northwest of downtown)
Tillamook Junior High	Tillamook Junior high	12 th Street	Off-street connection between the Bud Geinger Fitness Trail/Tillamook Junior High and 12 th Street
12 th Street	12 th Street	US 101	Connection from High School west to US 101.

Bicycle Needs and Deficiencies

The existing transportation network in Tillamook has few dedicated bicycle facilities. Bicycle signage and markings are also minimal throughout most parts of the City, and most bicycle facilities within the City require bicyclists to mix with traffic on arterial and collector roadways. The 2003 Tillamook TSP identified a designated bicycle network for arterial and collector roadways, as shown in Figure 11 below. The bicycle deficiencies and needs described in this section are discussed in the context of building out the designated bicycle network as identified in the previous TSP. Table 7 summarizes on-street bicycle needs and deficiencies.

TABLE 7. BICYCLE NEEDS AND DEFICIENCIES

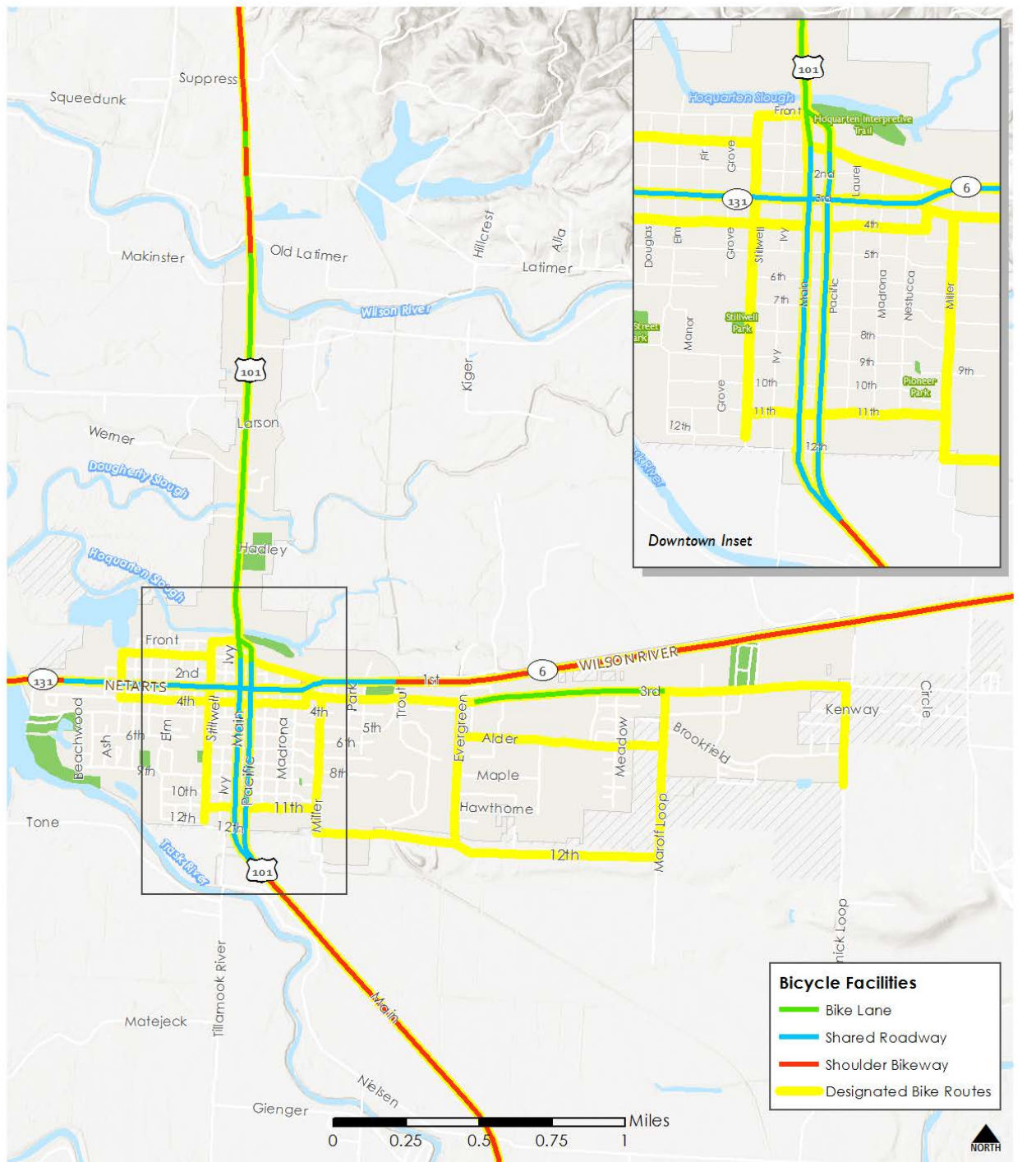
Facility Need	Location
Shared Roadway	1 st Street, US 101 to Cedar Street Cedar Street, 1 st Street to OR 131 2 nd Street, US 101 to Elm Street Elm Street, 2 nd Street to 4 th Street 4 th Street, Elm Street to Stillwell Stillwell, 4 th Street to 11 th Street 9 th Street, 9 th Street Park to Stillwell 11 th Street, Stillwell to Miller Miller, Tillamook High School to 3 rd Street 12 th Street, Tillamook High School to Marolf Loop Evergreen Drive, 12 th Street to 3 rd Street Alder, Evergreen to Meadow Avenue Marolf Loop, 12 th Street to 3 rd Street
Separated Bike Facility	3 rd Street, Goodspeed Park to McCormick Loop Road US 101 (Main and Pacific Avenues), 12 th Street to 4 th Street OR 131 (3 rd Street), Main Avenue to west City Limit
Off-Street Bike Connection	Tillamook Junior High to 12 th Street

As of the writing of this plan, the only bicycle facilities that have been implemented on the City's designated bicycle network are on the arterial network. The Crosstown Connections and US 101/OR 6 projects, presently under construction, will add bicycle lanes on a section of US 101 in downtown and

share lane markings on Stillwell, 4th and parts of 3rd Street east to Goodspeed Park; these facilities are shown as “existing” on Figure 11. Additional network needs include development of a cohesive shared roadway network on local streets and some collectors, including shared roadway treatments on Marolf Loop, 12th Street, 11th Street, and Stilwell Avenue as shown in Figure 11. The Hoquarton Waterfront Plan identified shared lane treatments on Front and 2nd Streets which not been implemented as of this writing.

A separated bicycle facility is needed on 3rd Street east of Goodspeed Park east to Olson Road. 3rd Street is a collector and though it does not have high traffic now in this area, much of the City’s anticipated growth is expected to occur south of 3rd Street, creating a need for separating cyclists from traffic. A separated bike facility is also needed on OR 6/3rd Street and US 101 south to 12th Street, given traffic volumes and speeds. The feasibility of these improvements will be evaluated further in *Technical Memo #8: Solutions Evaluation*.

FIGURE 10. TILLAMOOK BICYCLE NETWORK AND 2003 TSP DESIGNATED BICYCLE NETWORK



Existing Bicycle Facilities and Designated Bicycle Routes

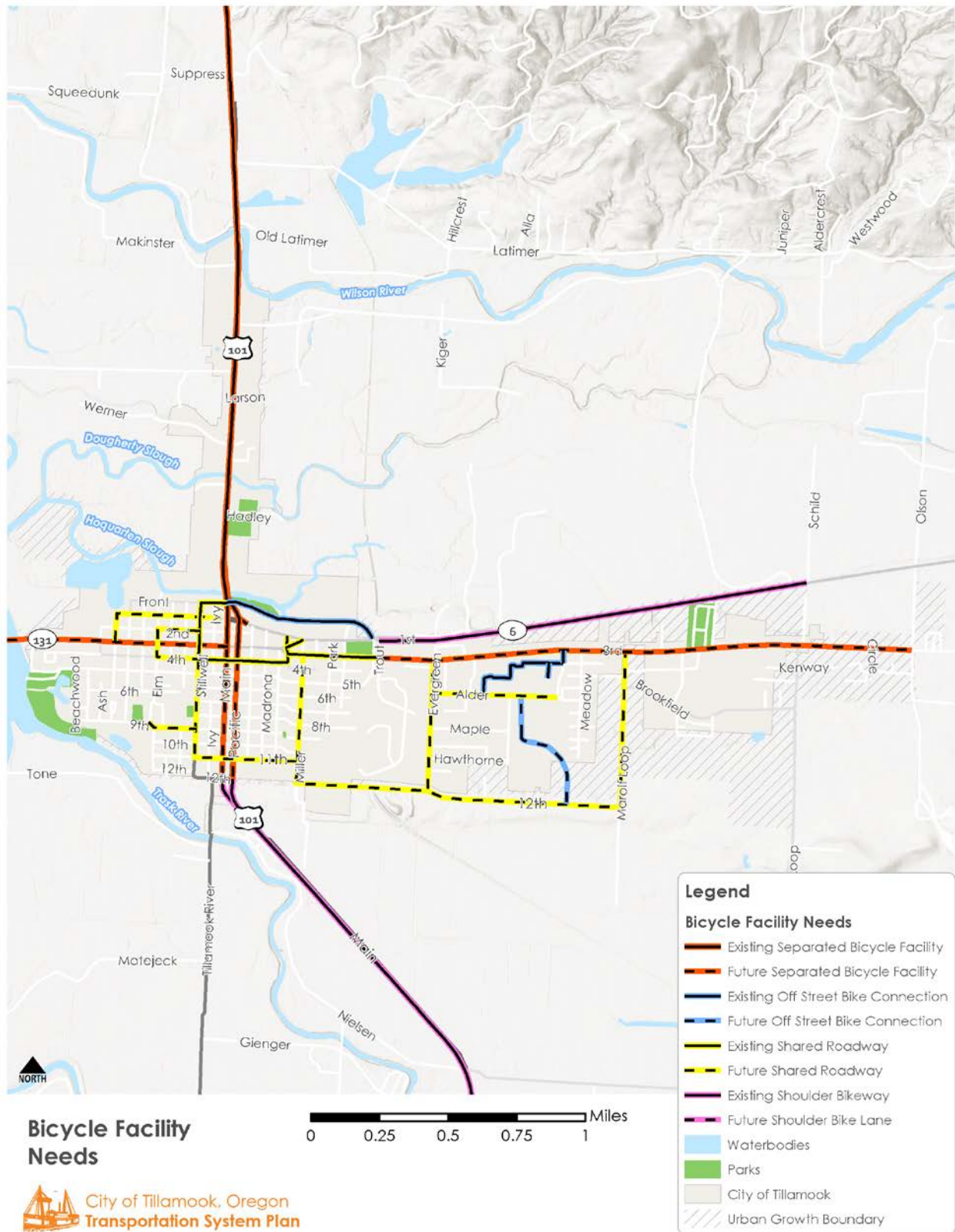


City of Tillamook, Oregon
Transportation System Plan

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FIGURE 11. BICYCLE FACILITY NEEDS



Public Transportation System Service Gaps and Deficiencies

Tillamook's growth is expected to place a greater demand on the City's existing public transportation services. The TCTD Transit Development Plan (TDP) estimates that between 2010 and 2040, transit demand is expected to increase by at least 20 percent. TDP-identified needs provide the basis for the needs described below. Other public transportation needs may be heard during the public outreach process for the TSP Update.

The size of the TCTD fleet is determined by the service needs. The financial forecast documented in the TDP has indicated that TCTD has a capacity to support up to three new buses. Currently, TCTD operates a fleet of 23 vehicles, comprised of five vehicle types. The TDP recommends that the fleet be standardized to two types of vehicles: medium-sized (approximately 30 to 32-foot) buses to provide fixed-route service, and mini-vans or small buses for paratransit services. Additional recommendations for the fleet include purchasing heavy-duty buses for fixed-route service, purchasing vehicles in larger batches, maintaining an average fleet age that is less than half of the average life span of the vehicles, and continuing to purchase low-floor buses, with the goal of eventually replacing all of the currently operating high-floor buses with low-floor models as part of the normal bus replacement schedule.

TABLE 8. CURRENT FLEET INVENTORY

Vehicle Type	Fuel	Capacity (Seats)	Useful Life	Count
B: Medium-Size, Heavy-Duty Transit Bus	Diesel	28-33	10yr/350,000 mile	9
C: Medium-Size, Medium Duty Bus & Van Chassis Cutaway Bus	Gas	14-18	7yr/250,000 mil	1
D: Medium-Size, Light-Duty Bus & Van Chassis Cutaway Bus	Diesel	14-18	5yr/150,000 mile	4
E1: Small, Light-duty Bus	Gas	9	4yr/100,000 mile	2
E3: Modified Minivans	Gas	5-6	4yr/100,000 mile	7
B: Medium-Size, Heavy-Duty Transit Bus	Diesel	28-33	10yr/350,000 mile	9
TOTAL		70 – 84		23

Source: Tillamook Transit Development Plan (2016)

Based on the useful life of the fleet and the date of purchase, approximately 18 of TCTD's 23 vehicles will need to be replaced by 2020, which equates to a total cost of \$2,240,000. It is anticipated that 75 percent of these new buses will be funded through Section 5339 and the remainder through local match. Given the need to replace buses, the TDP recommends that TCTD develops a long-range fleet financing plan. The plan would include both a replacement schedule of existing buses as they reach the end of their useful life, as well as possible fleet expansion to accommodate service growth.

Table 9 summarizes high-level public transportation service gaps and deficiencies as described in the TDP.

TABLE 9. TCTD PUBLIC TRANSPORTATION SYSTEM GAPS AND DEFICIENCIES

Route Number	Route Name	Deficiency Type	Description
N/A	N/A	Service Coverage	Consider expanding Routes 3 and 4 to include popular deviated fixed route destinations
N/A	N/A	Service Coverage	Add more stops in Tillamook, Nehalem, and Manzanita
N/A	N/A	Service Coverage	Add new service to Mohler/Highway 53 and Neah Kanie
N/A	N/A	Service Coverage	Add or increase service to key community destinations, such as the Tillamook PO, YMCA, and VA Clinics
N/A	N/A	Service Frequency	Increase service frequency to heavily-trafficked areas on north-south routes
1	Tillamook Town Loop	Service Coverage	Expand local fixed route service within the City limits. Currently, Route 1 is the only city-specific route.
1	Tillamook Town Loop	Service Frequency	Provide earlier morning and later evening service
2	Tillamook – Oceanside – Netarts	Service Frequency	Increase frequency between PM peak travel period
3	Tillamook – Manzanita – Cannon Beach	Service Frequency	Increase mid-day service and extend evening hours
4	Tillamook – Lincoln City	Service Coverage	Provide fixed-route bus service to the Port of Tillamook Bay, Woods (Route 4)
4	Tillamook – Lincoln City	Service Frequency	Provide earlier service to shelters in Hebo, Cloverdale, and Beaver
5	Tillamook – Portland	Service Coverage	Provide connections to Beaverton and Hillsboro (Route 5)
6	Coastal Connector	Service Frequency	Extend service hours to Lincoln City, Salem, and Grande Ronde

Source: Tillamook Transit Development Plan (2016)

Truck Freight Needs and Deficiencies

Potential truck freight needs were reviewed and identified based on the following factors to accommodate safe and efficient freight movement:

- Connectivity – Is the freight network defined and connected, providing for regional truck trips as well as access to industrial and commercial areas within Tillamook?
- Geometrics – Are designated truck routes modernized and built to current standards?
- Mobility – Have locations along key truck routes been identified as congestion or mobility issues?

Truck Routes and Connectivity

The intent of a truck route is to provide the most efficient route that minimizes the modal conflicts while providing adequate connections between the state and local systems. While it is preferred to separate trucks from other modes as much as possible, conflicts with other modes in some areas (such as downtown) are unavoidable due to the confluence of land uses and the regional highway junctions.

The current truck routes generally provide access to industrial areas. Two main industrial areas in town are the mill site (bordered by 3rd Street, Evergreen Drive, and 12th Street) and the downtown industrial area on Front Street and 1st Street. These areas are served by local freight routes on 10th Street, 3rd Street, Front Street, and 1st Street to access the regional highways in Tillamook. There may be need for an additional east-west local truck route, potentially on 12th Street. This local freight route could serve the mill and any nearby farms with large equipment transportation needs. It's important to note that even with designated truck routes, trucks still may need to use other roads to reach their destination. Adequately signing designated truck routes could reduce the amount of truck traffic using non-designated streets.

Truck Route Geometrics

Roadways that do not meet current cross-section standards are noted in a prior section. Several of these roads are located on designated truck routes:

- US-101: Hadley Road to Front Street (some of this segment will meet standards after the US-101/OR-6 project is completed)
- 3rd Street: from Schild Road to Olson Road
- Birch Avenue: 1st Street to 3rd Street
- Wilson River Loop: 3rd Street to OR-6
- Olson Road: 3rd Street to OR-6

Truck Mobility Needs

Traffic mobility was summarized in a prior section for identified study intersections. None of the study intersection movements⁸ located along truck routes are projected to exceed mobility standards by 2040.

⁸ The northbound left turn movement on Evergreen Drive at 3rd Street exceeds the mobility standard. While 3rd Street is a truck route, the movement from Evergreen Drive is not along the truck route.

Bridges

There are five bridges along the state highway system. There are no bridges on local roadways that are being assessed in the TSP. Sufficiency ratings from 2016 were acquired from ODOT and were used to determine the condition of the bridges. A bridge with a sufficiency rating of less than 45 is considered poor condition. The Wilson River bridge along US 101 at the north end of the city has a sufficiency rating of 41.3 and thus is in poor condition. All other bridges were deemed sufficient.

Air, Marine, and Rail Systems

Due to the nominal growth expected in the planning horizon, there are no anticipated needs for air, marine, or rail transportation in Tillamook. It should be noted that the Tillamook Airport is classified as a Tier 2 airport in the Oregon Resilience Plan⁹, which means it will be needed to provide access to rural areas and restore major commercial operations in the event of a major earthquake. Thus, it is important to maintain the same level of service at this facility in the future.

City and Port of Tillamook Bay staff have also noted a need for enacting regulations governing the use of drones within the City and vicinity of the airport; the Federal Aviation Administration regulates use of drones as well, including requirements that local airports be notified if drone use will occur within 5 miles of an airport and that drone users maintain site of the drone at all times during use.

There is a need for formalized boat launch access points within the City to access the Tillamook County Water Trail system. Potential boat launch points will be described in *Technical Memo #8: Solutions Evaluation*.

Emergency Response and Evacuation Routes

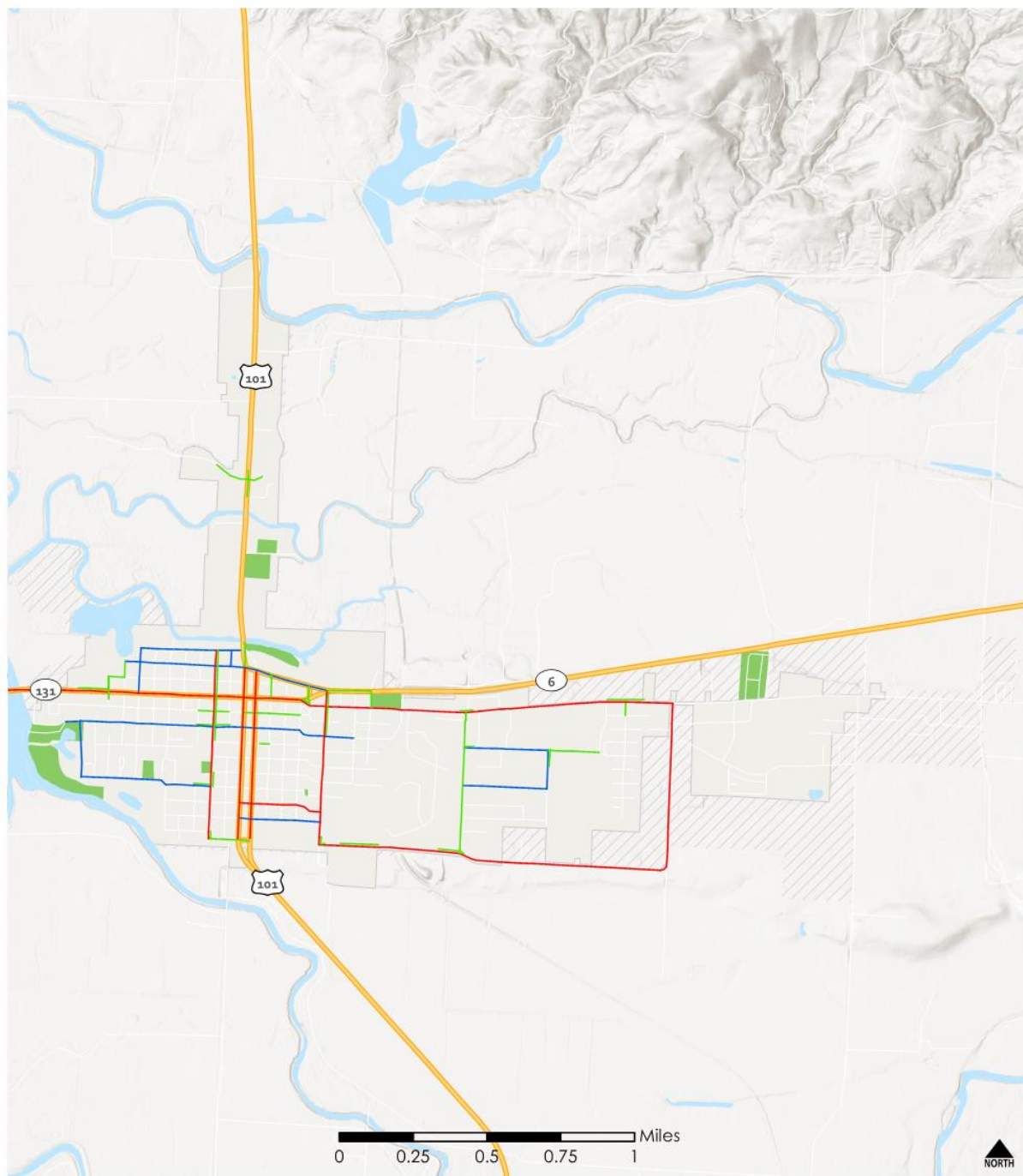
Tillamook is in a tsunami evacuation area, which makes it crucial to have an established emergency response plan. The current tsunami evacuation map is provided under existing conditions. In addition, a map prioritizing the local emergency response routes in the city is presented in Figure 12. This map shows essential roadways to be cleared after a natural disaster or during hazardous weather conditions.

The map includes the following designations:

- Ice Routes – The de-icing routes were identified to provide emergency response vehicle mobility as the first priority. The second consideration included school bus routes.
- Emergency Level 1 – These are the priority routes related to natural disasters (flooding, wind event, earthquake, etc.). These are the primary routes that provide east-west and north-south connectivity around and through Tillamook and give access to all parts of the city for emergency responders. Third Street is designated as Level 1 due to the hospital, ambulance barn, city hall, county courthouse, police department, 911 call center, and fire department all being located along or near the corridor.
- Emergency Level 2 – These are the secondary emergency routes that connect several of the primary streets and provide more north-south and east-west streets to connect the neighborhoods for local access.

⁹ Oregon Seismic Safety Policy Advisory Commission (OSSPAC). The Oregon Resilience Plan, page 129. February 2013.

FIGURE 12. LOCAL ROADWAY PRIORITIZATION MAP



Emergency Prioritization



Legend

- Ice
- Level 1
- Level 2
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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Effects on Title VI and Environmental Justice Populations

This section identifies Title IV (1964 Civil Rights Act) and Environmental Justice Populations (collectively referred to as “communities of concern”) within the City of Tillamook to provide a basis for understanding how system needs and deficiencies may or may not disproportionately affect communities of concern. The following demographic indicators are used to define Title VI and Environmental Justice populations for the purposes of this planning process.

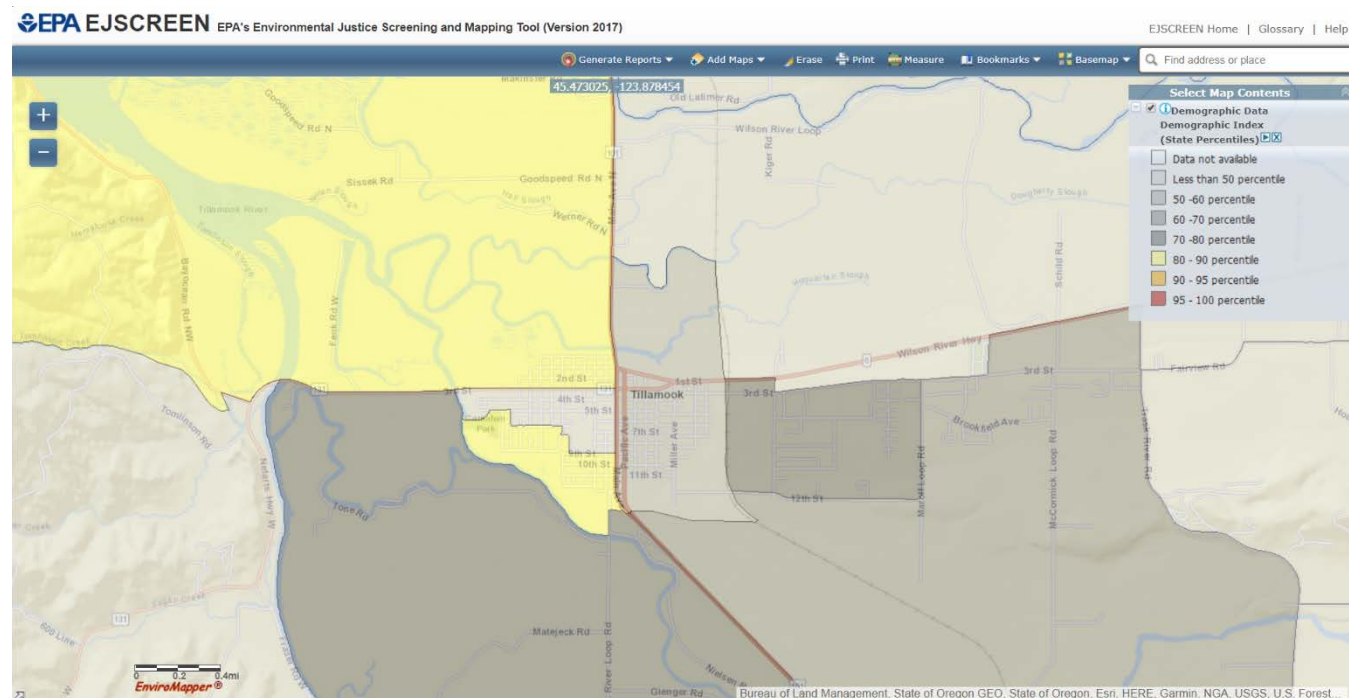
- **Percent minority:** Percent minority as a fraction of population, where minority is defined as all Non-White, Non-Hispanic.
- **Percent low-income:** Percent of individuals whose ratio of household income to poverty level in the past 12 months was less than 2 (as a fraction of individuals for whom ratio was determined).
- **Percent less than high school education:** Percent of individuals age 25 and over with less than high school degree.
- **Percent Limited English Proficiency (linguistic isolation):** Percent of households in which no one age 14 and over speaks English "very well" or speaks English only (as a fraction of households).
- **Percent over age 64:** Percent of individuals over age 64 as a fraction of the population.
- **Percent under age 5:** Percent of individuals under age 5 as a fraction of population.

The project team used the U.S. Environmental Protection Agency’s (EPA) “EJ Screen” tool to assess specifically the locations of minority and low-income residents (Figure 13). Based on this data, the highest concentrations of minority and low-income residents are located in the northwest quadrant of the City, north of 3rd Street and west of US-101. The other major concentration is south of OR-131 and west of US-101, near the southern City limits along the Trask River. There are also concentrations of low income and minority residents between the railroad and Marolf Loop Road, between OR-6 and 12th Street.¹⁰

Census data will be augmented through public outreach to ensure a full understanding of the needs and impacts of transportation deficiencies on all communities of concerns identified above. Since communities of concern may have reduced mobility due to limited or no access to a personal vehicle, it is reasonable to assume that addressing the bicycle, pedestrian, and public transportation needs identified in this memorandum are likely to especially benefit these populations.

¹⁰ Percentiles are calculated from the statewide population, based U.S. Census Bureau's American Community Survey (2011-2015) 5-Year Estimates at the block group level.

FIGURE 3. EPA ENVIRONMENTAL JUSTICE SCREENING - DEMOGRAPHIC INDEX (STATE PERCENTILES)



Appendix H

Solutions Evaluation



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Technical Memorandum #8 - Solutions Evaluation

July 19, 2018

Prepared for: Paul Wyntergreen, City of Tillamook
Ken Shonkwiler, ODOT

Prepared by: Eddie Montejo, Jacobs
Ryan Farncomb, Jacobs
Garth Appanaitis, DKS
Amanda Deering, DKS

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Introduction

This memorandum describes recommended solutions and strategies for addressing transportation deficiencies and needs in the City of Tillamook. Recommended solutions address each modal element of the City's transportation system and build off staff analysis as well as input received to date from City staff, the Project Advisory Committee (PAC), and community stakeholders. Many of the solutions in this memorandum are previously recommended projects in other plans that have not been implemented. In other cases, solutions address recently identified needs as part of the Tillamook Transportation System Plan (TSP) update process.

As part of the needs identification process, public and stakeholder feedback was organized into themes corresponding to transportation system needs in Tillamook. As draft transportation solutions were developed, these themes were considered to ensure that system solutions reflected the values of the community. A general theme that emerged from this process was the desire to achieve balanced modal priorities as the City plans for future transportation investments.

This memorandum first identifies solutions and strategies that improve the existing transportation system that do not add vehicle capacity, such as Safe Routes to Schools improvements, single occupancy trip reduction programs, corridor management strategies, and Intelligent Transportation System strategies.

The 2003 Tillamook TSP identified several improvements to improve pedestrian, bicycle, and vehicle safety in the downtown area, including changes to intersections on US-101 and a recommendation for consideration as a Special Transportation Area (STA), which the Oregon Department of Transportation (ODOT) subsequently conferred. Many of the projects described in this memorandum are derived from the 2003 TSP and the 2016 Hoquarton Waterfront Plan. The Hoquarton Waterfront Plan and subsequent amendments have been recently adopted by the City and the projects it contains will be carried forward to the updated TSP. As such, projects derived from the Hoquarton Plan are not evaluated with respect to the TSP evaluation criteria.

Planning level cost estimates, potential funding sources, and funding priorities are included for all recommended projects and strategies. This memorandum also evaluates proposed transportation solutions to determine consistency with TSP Goals and Policies, in an effort to build an actionable list of projects to recommend in the final TSP.

Transportation Demand Management (TDM)

Parking

The 2003 TSP recommended a study to identify parking issues and solutions in downtown Tillamook. The City and County addressed some of these downtown parking issues in a 2006 Transportation Refinement Plan, including recommendations to improve the management and use of existing spaces and options for creating additional spaces. Building from these recommendations, the City developed a complete Downtown Parking Plan in 2014, which gathered comprehensive information about the downtown parking environment in Tillamook and supported a process for engaging community stakeholders to identify parking management strategies and projects in the downtown area. Relevant downtown parking strategies are carried over as part of the TSP update. Strategies and projects carried over from the 2014 Parking Plan are not evaluated according to the TSP Update evaluation criteria since they were previously adopted by the City.

Additional parking solutions have been identified in the Hoquarton Waterfront Plan (2016). Relevant parking management solutions are also carried forward from this plan.

During the needs identification process as part of the TSP update, community members expressed a desire for a TSP that balances a healthy local economy and business environment with bicycle infrastructure needs, including support for adequate on-street parking in the downtown area.

Parking solutions are summarized in Table 1 below.

TABLE 1. PARKING SOLUTIONS

Solution	Solution Description	Type of Action (project, policy, or program)	Source
Balance modal priorities in TSP Update	Balance modal priorities in TSP update to include business-supportive parking management strategies	Policy	TSP Update (2018)
Preserve angled parking on Ivy Avenue	Implement Ivy Avenue streetscape improvements to preserve angled parking.	Project	Hoquarton Waterfront Plan (2016)
Implement Development Opportunity City-owned parking lot	Activate underutilized land along 1 st Street between Stillwell and Main Avenues to create City-owned parking lot for gas vehicles, electric vehicles, and bicycles.	Project	Hoquarton Waterfront Plan (2016)
Implement parking management strategies in the Hoquarton Area	Implement proposed on-street parking; use wayfinding signs to guide visitors to off-street parking lots (particularly at 1 st and Ivy Avenue); manage utilization of on-street parking; actively manage turnover/spillover; provide strategic longer-term parking near boat/kayak launches	Program	Hoquarton Waterfront Plan (2016)
Site Design Parking zone overlay	Require parking lots to be located to the side or rear of buildings and integrate pedestrian and bike access and circulation.	Policy	Hoquarton Waterfront Plan (2016)
Off-street parking zone overlay	Reduce or eliminate off-street parking requirements for some types of development. Use and expand existing options for on-street parking credits, shared parking, and off-site parking in municipal or other shared lots. Require screening and separation of parking areas to minimize their visual and functional impact.	Policy	Hoquarton Waterfront Plan (2016)
Shared loading/parking area	Construct a parking area at the corner of Douglas and Front on a brownfield site, which will be used to cap the environmental contaminants. This lot could be used among businesses and for the future Foundry Park.	Project	Hoquarton Waterfront Plan (2016)

Extend Hoquarton House parking	Extend parking lot and connect trails to the Hoquarton Park and boardwalk.	Project	Hoquarton Waterfront Plan (2016)
Douglas Avenue, Front Street to Second Street	Streetscape improvements between 1st Street and 2nd Street to accommodate angled parking on the east side of Douglas Avenue.	Project	Hoquarton Waterfront Plan (2016)
Increase Enforcement	Deploy more resources to enforce downtown parking policies. (Near-term, 0-12 months)	Policy	Parking Management Plan (2014)
Dedicated employee parking	Implement dedicated employee parking in the downtown core. (Near-term, 0-12 months)	Policy	Parking Management Plan (2014)
Surface parking management	Implement uniform design standards (e.g. striping, landscaping, lighting, etc.) and on-site signage to improve surface parking facilities. (Near-term, 0-12 months)	Policy	Parking Management Plan (2014)
Structured and consistent parking system	Implement structured and consistent parking system in downtown Tillamook (e.g. signage, striping, communication, etc.). (Near-term, 0-12 months)	Policy	Parking Management Plan (2014)
Stripe on-street parking	Strip all on-street parking in all commercial parking areas of the downtown to better identify parking availability and location. (Near-term, 0-12 months)	Project	Parking Management Plan (2014)
Upgrade on-street signage	Upgrade on-street signage to create uniform time stays by area and implement a common signage “brand” within the context of the upgrade. (Near-term, 0-12 months)	Project	Parking Management Plan (2014)
Distinct parking areas	Create distinct parking areas to reduce conflicts between visitors and employees. (Near-term, 0-12 months)	Project	Parking Management Plan (2014)
Initiate limited parking enforcement	Initiate limited parking enforcement activities in the downtown to assure existing time zones are honored and system utilization/turnover is operating as intended. (Near-term, 0-12 months)	Program	Parking Management Plan (2014)
Downtown Parking Working Group	Establish a Downtown Parking Working Group as a forum for addressing parking solutions in the downtown. (Near-term, 0-12 months)	Program	Parking Management Plan (2014)
Report to Parking Working Group	Develop, initiate, and routinely report on enforcement actions to the Parking Working Group. (Mid-term, 12-24 months)	Program	Parking Management Plan (2014)
Provide parking information via the City’s website	Initiate development of parking information via the City’s website (e.g., color maps showing parking areas by time stay, rules, and expectations, etc.) (Mid-term, 12-24 months)	Project	Parking Management Plan (2014)

Develop marketing/communications system	Partner with the business community to develop/refine a broad-based marketing and communication system for access in Tillamook. The marketing/communication system could include (but not be limited to): branding, maps and Transportation Demand Management (TDM) alternatives. (Mid-term, 12-24 months)	Program	Parking Management Plan (2014)
Parking inventory and occupancy study	Initiate a complete parking inventory and occupancy study soon after implementation of near-term strategies. This could be coordinated as a “before and after” analysis of parking timed to the US-101/OR-6 Traffic Improvement Project. (Mid-term, 12-24 months)	Project	Parking Management Plan (2014)
Negotiate shared use and/or lease agreements	Negotiate shared use and/or lease agreements with owners of strategically placed existing private surface lots in the downtown to provide for an interim supply of parking where needed. Begin focus on facilities identified as having surplus parking. (Mid-term, 12-24 months)	Project	Parking Management Plan (2014)
Improve the quality of surface parking	Improve the quality of surface parking lots in the downtown. (Mid-term, 12-24 months)	Project	Parking Management Plan (2014)
Develop a Residential Parking Permit Zone (RPPZ) Policy and Program	Develop a Residential Parking Permit Zone (RPPZ) Policy and Program for adoption by the City Council for future implementation in residential areas affected by spillover from commercial parking. (Mid-term, 12-24 months)	Policy	Parking Management Plan (2014)
Establish business-to-business outreach and communication plan	Establish business-to-business outreach and communication plan to downtown business on parking issues and planning. (Mid-term, 12-24 months)	Project	Parking Management Plan (2014)

Transportation System Management and Operations (TSMO)

TSMO solutions we considered at both the broad city-wide level and to address individual mobility needs. This section focuses on the broad city-wide solutions, while TSMO solutions for individual mobility needs are included within the traffic improvements section.

Current ITS equipment in and near Tillamook is limited to Highway Advisory Radio (HAR) Beacon Signs (along US-101 north and south of the city as well as OR-6 east of the city) and a weather warning system located east of the City (to warn for potential landslides). Variable message signs (VMS) could relay alternate routes to regional traffic in the event of an incident (accident, flooding, etc.) in the city. However, these future considerations do not address an identified need.

Policies

The following policies could be considered to enhance TSMO in Tillamook:

- Install conduit for communications systems when building/rebuilding roads along planned ITS corridors.

Pedestrian and Bicycle System Solutions

The project team identified pedestrian and bicycle needs and deficiencies on existing and planned roadway segments throughout the City, based on an analysis of existing and future conditions (documented in *Technical Memos #5 and #6*), and taking into consideration recommendations from previous plans and studies, such as the 2003 Tillamook TSP. Additional pedestrian and bicycle system needs have been identified by members of the public and project stakeholders as part of the Tillamook TSP update.

A full discussion of pedestrian and bicycle system needs can be found in to *Technical Memo #7: Transportation Needs and Deficiencies*. The following sections describes pedestrian and bicycle system solutions, organized by mode.

Pedestrian System

The 2003 TSP recommended several improvements to the pedestrian system to address sidewalk gaps and deficiencies. The 2016 Hoquarton Waterfront Plan recommended additional policies, projects, and programs to improve the pedestrian system in the Hoquarton Area. Table 2 below carries forward recommendations that have not yet been implemented and should be considered now.

TABLE 2. PEDESTRIAN SYSTEM SOLUTIONS (2003 TSP AND 2016 HOQUARTON WATERFRONT PLAN)

Project ID	Solution	Solution Description	Type of Action (project, policy, or program)	Source
P-1	Streetscape - Front Street, Ivy Avenue to US-101	Streetscape: sidewalk infill (450 linear feet), curb rehabilitation, pedestrian ramps, and roadway striping and signage.	Project	Hoquarton Waterfront Plan (2016)
P-1	Streetscape - 2nd Street, Fir Avenue to US-101	Streetscape: sidewalk/curb rehabilitation (600 linear feet) between Grove Ave and Fir Ave to accommodate extension of one-way section; roadway striping and signage through segment	Project	Hoquarton Waterfront Plan (2016)
P-1	Streetscape - Fir Avenue, Front Street to 2nd Street	Streetscape: sidewalk infill (875 linear feet), curb rehabilitation, pedestrian ramps, curb extensions, and roadway striping and signage.	Project	Hoquarton Waterfront Plan (2016)
P-1	Streetscape - Grove Avenue, 1st	Streetscape: sidewalk infill (500 linear feet), curb rehabilitation, pedestrian	Project	Hoquarton Waterfront Plan (2016)

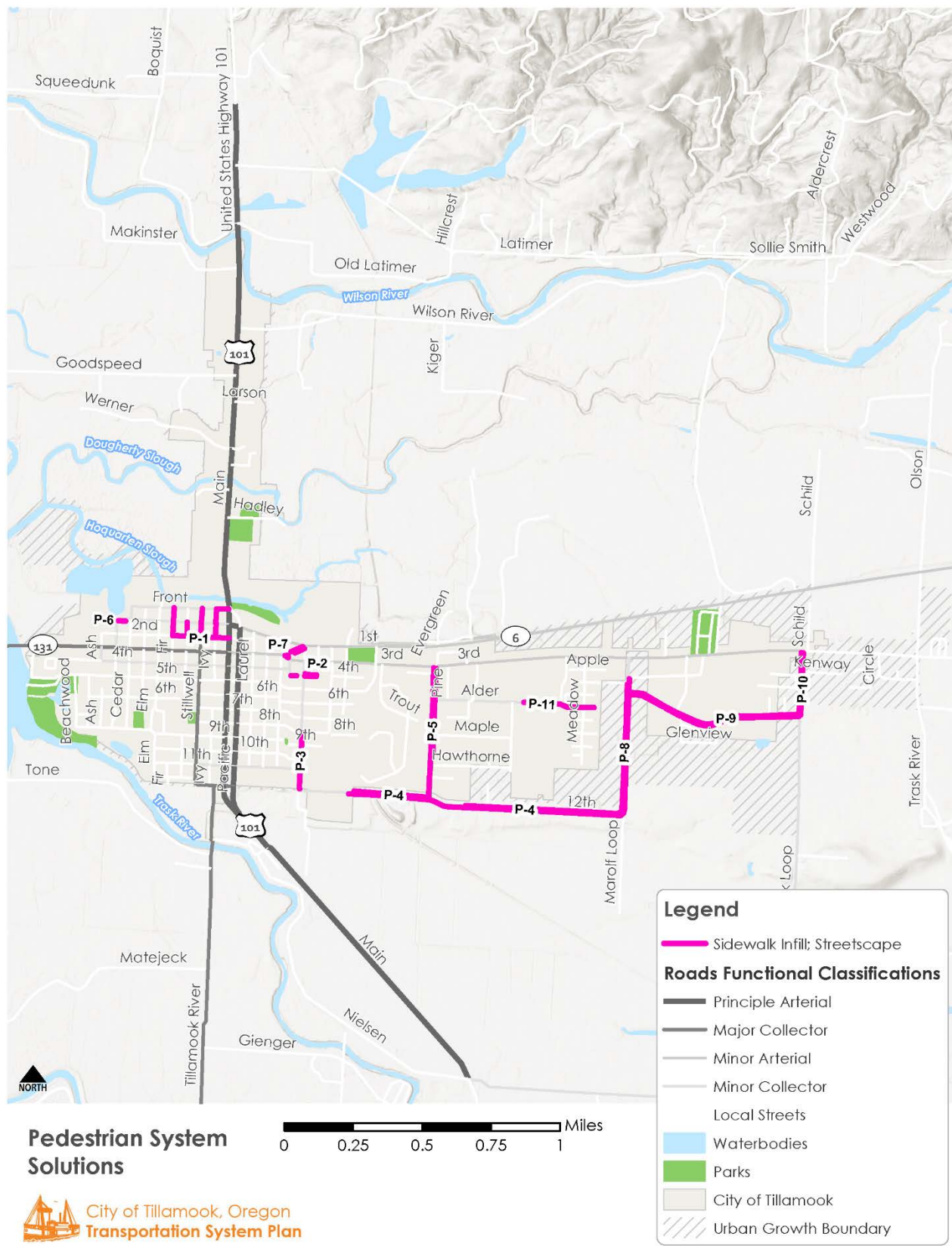
	Street to 2nd Street	ramps, curb extensions, and roadway striping and signage.		
P-1	Streetscape - Stillwell Avenue, Front Street to 2nd Street	Streetscape: curb extensions, roadway striping and signage.	Project	Hoquarton Waterfront Plan (2016)
P-1	Streetscape - Ivy Avenue, Front Street to 2nd Street	Streetscape: sidewalk infill (125 linear feet), curb rehabilitation, pedestrian ramps, and roadway striping and signage.	Project	Hoquarton Waterfront Plan (2016)
P-1	Streetscape – Hoquarton Slough to 4th Street	Downtown sidewalk construction/replacement from Hoquarton Slough to 4 th Street. Includes bulb-outs at 2 nd , 3 rd , and 4 th Streets (Phase 1 of the transportation enhancement project)	Program	Tillamook TSP (2003)

Sidewalks

The project team identified several sidewalk gaps and deficiencies for arterial and collector streets as part of the needs analysis for the Tillamook TSP update. Sidewalk gaps on local streets were not specifically assessed as part of this process, although some local street gaps were identified where warranted by access and connectivity needs.¹ Table 3 below summarizes all sidewalk solutions identified through this process. In assessing the system-wide pedestrian network needs, off-street trail and multi-use connections were also identified. These off-street trail and multi-use connections are considered part of Tillamook’s pedestrian system although these facilities can be shared by pedestrians and bicyclists. Additional sidewalk needs and deficiencies were identified via public involvement as part of the needs analysis process. Sidewalk and off-street pedestrian solutions identified as part of the needs analysis and stakeholder involvement process are summarized in Figure 1 below.

¹ A full discussion of sidewalk gaps and deficiencies, refer to *Technical Memo #7: Transportation Needs and Deficiencies*.

FIGURE 1. PEDESTRIAN SYSTEM SOLUTIONS – SIDEWALK SOLUTIONS ARTERIAL AND COLLECTOR NETWORK



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TABLE 3. PEDESTRIAN SYSTEM SOLUTIONS – SIDEWALK SOLUTIONS ARTERIAL AND COLLECTOR NETWORK

Project Id	Street	From	To	Need
P-2	4 th Street	Miller Street	Park Street	Sidewalk infill needed on east and west sides of Miller Street, just east of 4 th and Ocean
P-3	Miller Avenue	9th Street	12 th Street	No sidewalk on one side of the street; There is a sidewalk gap at the Miller Street entrance to the Tillamook High School parking lot
P-4	12th Street	Tillamook High School	Marolf Loop Drive	No sidewalk on both sides of the street
P-5	Evergreen Drive	12 th Street	3 rd Street	No sidewalk on either side north of Hawthorne Lane; no sidewalk on one side south of Hawthorne Lane
P-6	1 st Street	Birch Street	Cedar Street	Sidewalk infill needed; potentially connect to future off-street path around Hoquarton Slough
P-7	1 st /3 rd Street	Miller Avenue		Sidewalk infill on 1 st , 3 rd , and Ocean Streets connecting to Miller Avenue
P-8	Marolf Loop	12 th Street	Brookfield Drive	No sidewalk on both sides of the street
P-9	Brookfield Drive	Marolf Loop Drive	McCormick Loop Drive	No sidewalk on both sides of street
P-10	McCormick Loop	Brookfield Drive	3 rd Street	No sidewalk on both sides of the street
P-11	Alder Lane/Dogwood Avenue	Near Tillamook Jr. High School and East Elementary School		Sidewalks are needed on Dogwood Avenue near Tillamook Jr. High School and East Elementary School

Crossings

The project team have identified crossing improvement needs. Additional crossing solutions have been carried over from previous planning efforts, including the 2003 Tillamook TSP and Hoquarton Waterfront Plan (2016). Needed pedestrian crossing improvements are summarized in the tables and maps below (Figures 2 and 3, Table 4). Pedestrian crossing solutions are organized into two generalized categories for cost estimation purposes:

- **Basic Crossing Needs** describe needs at lower vehicle traffic arterial and collector intersections. Safety concerns and/or traffic volumes are lower at these locations, and crossing improvements are likely to include restriping or completion of existing crosswalk markings, repair, or update of existing curb ramps, or signage updates.
- **Advanced Crossing Needs** describe needs at key nodes within the arterial and collector network. Safety concerns and/or traffic volumes are higher at these locations, requiring a higher level of protection for pedestrians and other vulnerable road users. Crossing improvements at these locations may augment basic crossing improvements and may include pedestrian signalization², raised crossings, curb bulb outs, and curb ramp installation or reconstruction.

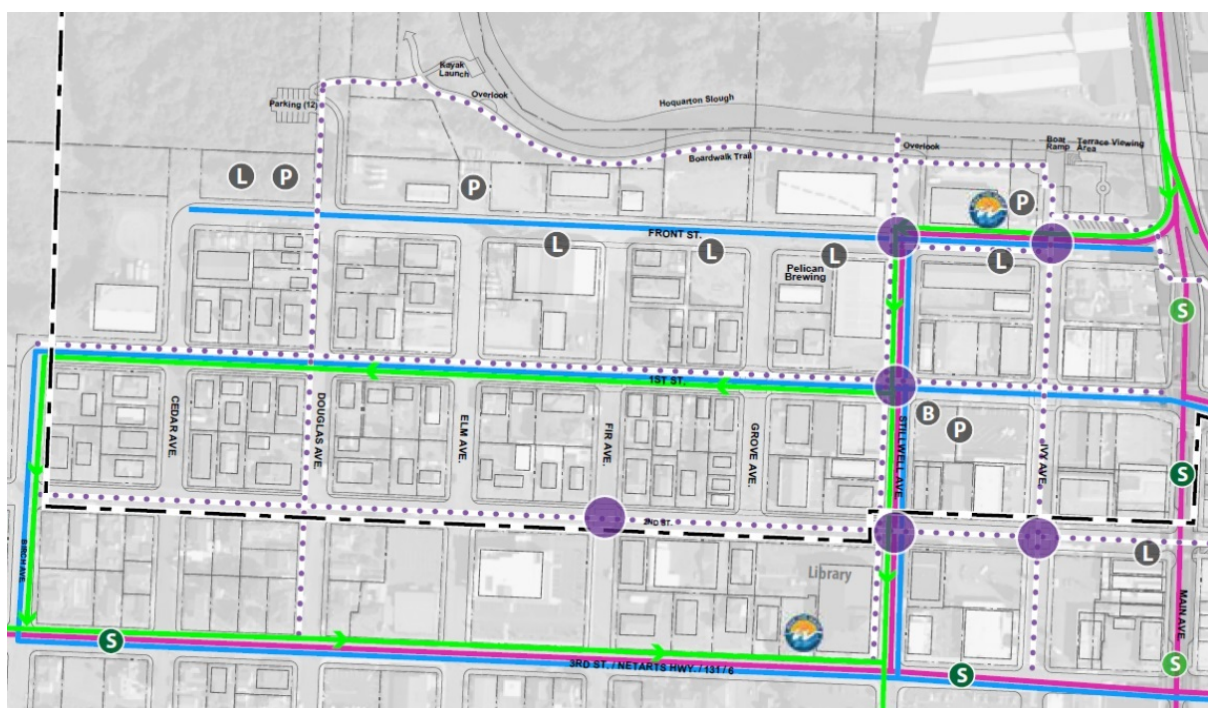
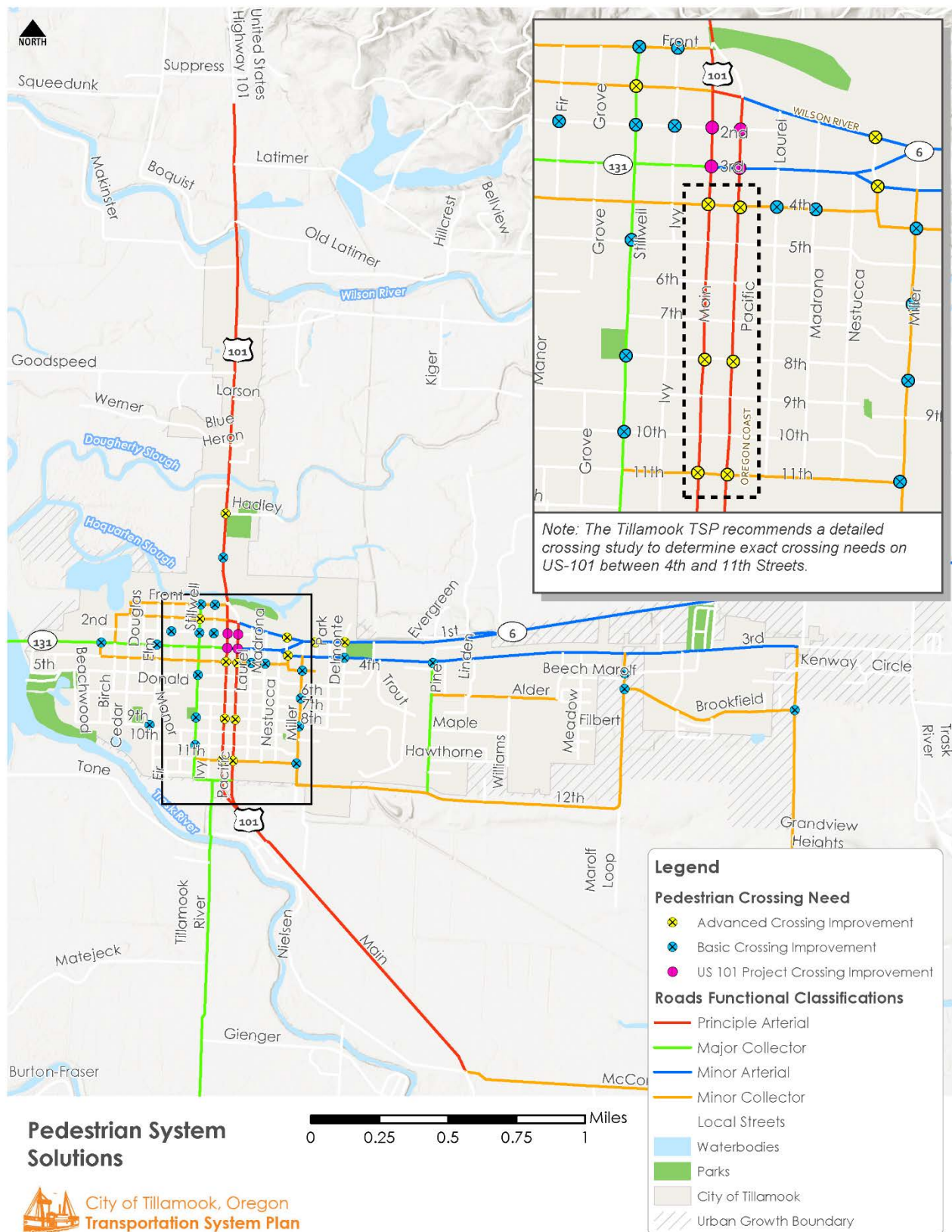


FIGURE 2. HOQUARTON WATERFRONT PLAN (2016) - RECOMMENDED ENHANCED CROSSINGS ARE SHOWN IN PURPLE

² Pedestrian signal improvements may need to be considered separately in order of magnitude costing exercise, as the cost will increase significantly from other crossing enhancements.

FIGURE 3. PEDESTRIAN SYSTEM SOLUTIONS - CROSSING IMPROVEMENTS ON ARTERIAL AND COLLECTOR NETWORK



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TABLE 4. PEDESTRIAN CROSSING SOLUTIONS

Corridor	Location	Description/Justification	Need (Basic/Advanced)
OR-131/3 rd Street and OR-6 1 st and 3 rd Streets	OR-131/3 rd Street at Ash Avenue	Medical facility on north side of OR-131	Basic Crossing Improvement
	OR-131/3 rd Street at Elm Avenue	Additional marked crossing location on OR-131	Basic Crossing Improvement
	OR-6/1 st Street at Goodspeed Place	Existing marked crossing; multiple lanes of vehicle traffic at this location	Advanced Crossing Improvement
	OR-6/1 st Street at Delmonte	Implement marked crossing and curb bulb outs at Delmonte	Advanced Crossing Improvement
	OR-6/1 st and 3 rd Streets at Ocean Avenue	2003 TSP: Provide a raised island at Ocean Place and 4th and 3rd Streets for a safe pedestrian refuge with marked crosswalks on every approach. Designate Ocean Place between the OR-6 couplet as northbound only.	Advanced Crossing Improvement
Stillwell Avenue	Stillwell at Front Street	Hoquarton Waterfront Plan: Enhanced Crossing Improvement Location	Basic Crossing Improvement
	Stillwell at 1 st Avenue	Build a crosswalk and consider a 4-way stop to facilitate safe pedestrian travel at this location; Hoquarton Waterfront Plan recommends an Enhanced Crossing here	Advanced Crossing Improvement
	Stillwell at 2 nd Avenue	Hoquarton Waterfront Plan: Enhanced Crossing Improvement Location	Basic Crossing Improvement
	Stillwell Avenue at 5 th Street	Collector street; facilitate safe crossing to nearby school, YMCA and park	Basic Crossing Improvement
	Stillwell Avenue at 8 th Street	Collector street; facilitate safe crossing to nearby school, YMCA and park	Basic Crossing Improvement
	Stillwell Avenue at 10 th Street	Collector street; facilitate safe crossing to nearby school, YMCA and park	Basic Crossing Improvement
3 rd Street (east of Miller Ave)	3 rd Street at Del Monte Avenue	Crossing to Goodspeed Park	Basic Crossing Improvement
	Evergreen Drive at 3 rd Street	Future traffic forecasts indicate significant increases in vehicle traffic at this location	Basic Crossing Improvement
4 th Street	4 th Street at Laurel Avenue	Minor collector crossing	Basic Crossing Improvement
	4 th Street at Madrona Avenue	Minor collector crossing	Basic Crossing Improvement
9 th Street	9 th Street at Elm Street	Improve deficient pedestrian crossing	Basic Crossing Improvement
US-101 NB Main and SB Pacific Avenues	US-101 Main Ave N, north of Hoquarton Slough and south of Hadley Rd N	No existing marked crossings along US-101 at this location.	Basic Crossing Improvement
	US-101 Main Ave N at Hadley Rd N	No existing marked crossings along US-101 at this location.	Advanced Crossing Improvement

Corridor	Location	Description/Justification	Need (Basic/Advanced)
	at 4 th Street	High-traffic crossing; implement marked crosswalks and signage	Advanced Crossing Improvement
	at 8 th Street	High-traffic crossing; implement marked crosswalks and signage and consider pedestrian activated signalization to facilitate crossings	Advanced Crossing Improvement
	at 11 th Street	High-traffic crossing; implement marked crosswalks and signage and consider pedestrian activated signalization to facilitate crossings	Advanced Crossing Improvement
Ivy Avenue	Ivy Avenue at Front Street	Hoquarton Waterfront Plan: Enhanced Crossing Improvement Location	Basic Crossing Improvement
	Ivy Avenue at 2 nd Street	Hoquarton Waterfront Plan: Enhanced Crossing Improvement Location	Basic Crossing Improvement
Fir Avenue	Fir Avenue at 2 nd Street	Hoquarton Waterfront Plan: Enhanced Crossing Improvement Location	Basic Crossing Improvement
Miller Avenue	Miller Avenue at 4 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
	Miller Avenue at 6 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
	Miller Avenue at 8 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
	Miller Avenue at 11 th Street	Improve crossings in vicinity of the mill site.	Basic Crossing Improvement
Marolf Loop Drive	Marolf Loop Drive south of 3 rd Street	Future development likely to create need for improved crossings	Basic Crossing Improvement
	Marolf Loop Drive at Brookfield Drive	Future development likely to create need for improved crossings	Basic Crossing Improvement

Downtown Pedestrian Crossings Study

As part of the needs identification process, a need to conduct a Downtown Pedestrian Crossings Study was determined. The purpose of the study would be to obtain a more precise understanding of crossing needs in downtown Tillamook, including the exact locations where crossings, pedestrian signalization, and signage ought to be deployed. The study is to be conducted as an implementation action of the TSP update, and is to be coordinated with the pedestrian system recommendations made as part of the Tillamook TSP update.

Policies

Additional policy recommendations to enhance pedestrian crossings in Tillamook:

- Implement findings from Tillamook Wayfinding Plan.
- Implement traffic calming on US-101 Main and Pacific Streets through downtown Tillamook, building off recent crossing improvements as part of the US-101/OR-6 Traffic Improvement Project.

Bicycle System Solutions

A designated bicycle network was previously identified in the 2003 TSP to establish safe bicycle access and connectivity on arterial and collector roadways throughout the City. Most of this network was never built out, requiring cyclists to continue mixing with traffic on unprotected, shared-use facilities. The 2016 Hoquarton Waterfront Plan and amendments established additional policies, projects, and programs to improve the bicycle system in the Hoquarton Area, including changes to the 2003 designated bicycle network west of US-101 and north of OR-131. Table 5 and Figure 4 below summarizes bicycle system solutions identified as part of the Tillamook TSP update process, as well as solutions brought forward from previous plans that have not yet been implemented and should be considered now.

TABLE 5. BICYCLE SYSTEM SOLUTIONS³

Facility	Location	Cost Estimate	Description/Justification
Shared Roadway (assumes shared roadway markings and signage) <i>*Project ID B-1</i>	<ul style="list-style-type: none"> 2nd Street, US-101 to Elm Street Elm Street, 2nd Street to 4th Street 4th Street, Elm Street to Miller Stillwell, 4th Street to 11th Street 9th Street, 9th Street Park to Stillwell 11th Street, Stillwell to Miller Miller, Tillamook High School to 3rd Street 12th Street, Tillamook High School to Marolf Loop Evergreen Drive, 12th Street to 3rd Street Alder, Evergreen to Meadow Avenue Marolf Loop, 12th Street to 3rd Street 	Shared Roadway ⁴ Cost per mile: \$26,400	2003 TSP identified designated bicycle network was not implemented, and there are few dedicated bicycle facilities in the City. Improvements at these locations assume relatively small levels of capital investment to support treatments such as shared roadway marking (“sharrows”) and wayfinding signage.
Bike Facilities (assumes traditional painted bike lanes)	<ul style="list-style-type: none"> (B-2) OR-131/3rd Street, Trask River to McCormick Loop Road (B-3) US-101 (Main and Pacific Avenues), 12th Street to 4th Street (B-4) 1st Street: Birch to Main Street (B-5) Birch Street: 1st to OR-131/3rd Street 	Separated Bike Facility ⁵ Cost per mile: \$32,000	Improvements in these locations assume moderate levels of capital investment to support facilities such as striped bike lanes, signage, and buffer zones where safety issues are present.
OR-131 Trask River Bicycle Cantilever	<ul style="list-style-type: none"> OR-131 bridge over Trask River 	N/A	Discuss option for cantilevering bikes off the bridge; conditional on replacement/adequate widening of the bridge to accommodate bicyclists.

³ It is recommended that where applicable, bicycle and pedestrian projects be coordinated to exact potential construction savings.

⁴ Assumes pavement markings and signage only: Two sharrows per every 500’ and two signs per every 750’

⁵ Assumes pavement markings only: 8” white striping on one side, and two bike lane legends per 750’

Facility	Location	Cost Estimate	Description/Justification
Bicycle Plaza	<ul style="list-style-type: none"> Southeast corner of 4th and Main Street 	Approx. \$8,000 - \$10,000 ⁶	Assumes tubular bike rack for 8-12 bicycles and overhead shelter.
Hoquarton Waterfront Plan (2016)			
Bike Facilities (assumes traditional painted bike lanes)	<ul style="list-style-type: none"> (B-3) SB US-101 through north City gateway (B-6) Front Street, Stillwell Avenue to US-101/SB Main Avenue (B-7) Stillwell Avenue, Front Street to south of OR-131/3rd Street (B-2) OR-131/3rd Street, Stillwell Avenue to Birch Street (B-5) Birch Street, 1st Street to OR-131/3rd Street 	Separated Bike Facility ⁷ Cost per mile: \$31,680	<p>The Hoquarton Plan designates these locations as “primary bike routes”, which assumes a higher level of protection that a shared street environment.</p> <p>Improvements in these locations assume moderate levels of capital investment to support facilities such as striped bike lanes, signage, and buffer zones where safety issues are present.</p>

Policies

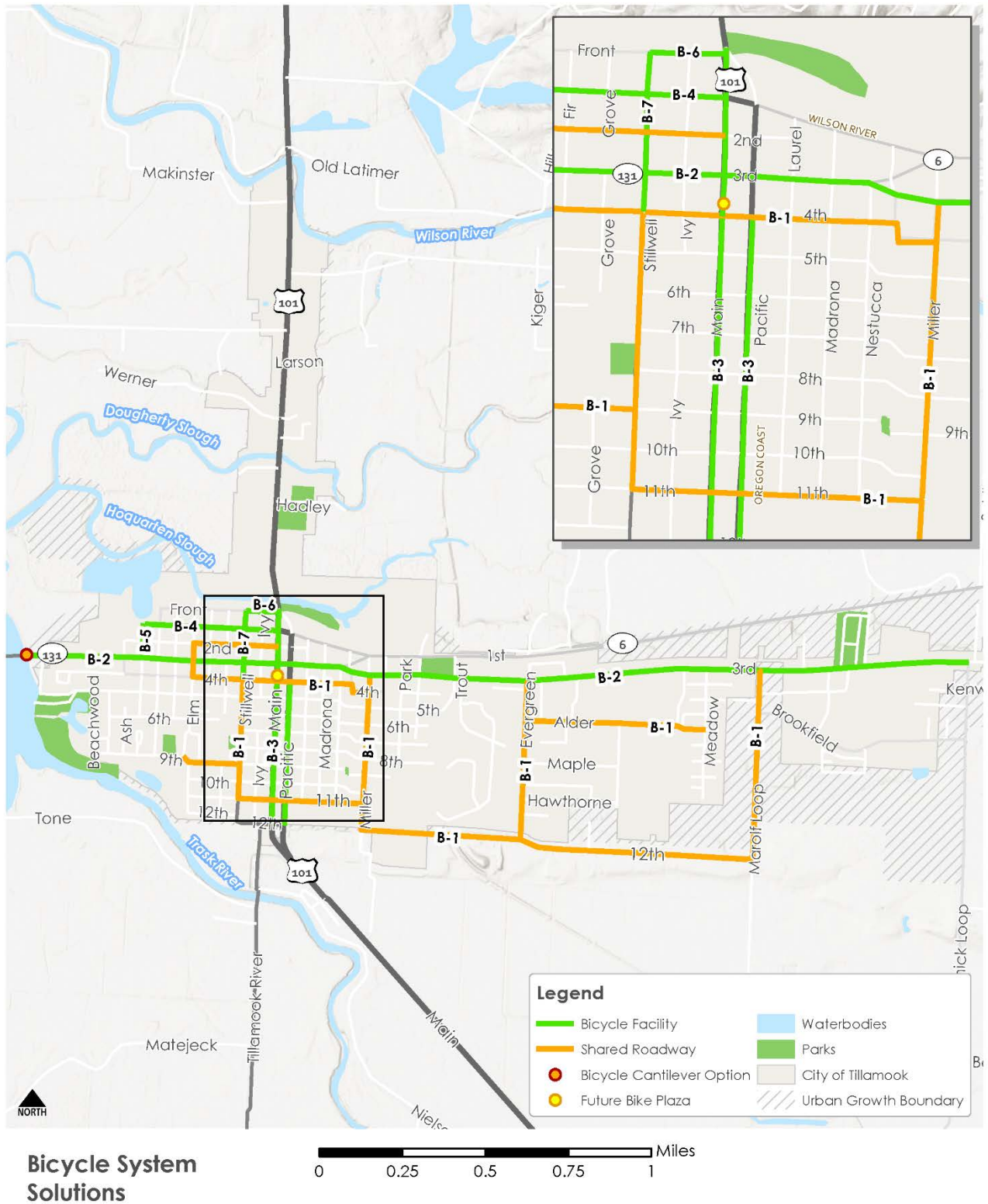
Additional policy recommendations to bicycle travel in Tillamook:

- Implement findings from Tillamook Wayfinding Plan.
- Implement traffic calming on US-101 Main and Pacific Streets through downtown Tillamook
- Consider seasonal parking policies to accommodate peak bicycle use during busy season without permanent parking removal

⁶ Based on [Staten Island Bicycle Parking Hardware Options Report](#) (1998), published by Staten Island Bicycle Parking at Transit. Unit cost information assumes standard covered bike parking for less than 12 bicycles.

⁷ Assumes pavement markings only: 8" white striping on one side, and two bike lane legends per 750'

FIGURE 4. BICYCLE SYSTEM SOLUTIONS - ARTERIAL AND COLLECTOR NETWORK



Safe Routes to School

The Safe Routes to School (SRTS) National Partnership works to advance safe walking and bicycling to and from schools to improve the health and wellbeing of all kids.⁸ With the passage of the 2017 Keep Oregon Moving Act, the Oregon Legislature has allocated an annual \$10 million investment in Oregon's SRTS Fund, increasing to \$15 million in 2023. Projects to construct or improve bicycle lanes, sidewalks, reductions in vehicle speeds, and crossings within 1 mile of a public school are eligible to receive state SRTS funds.

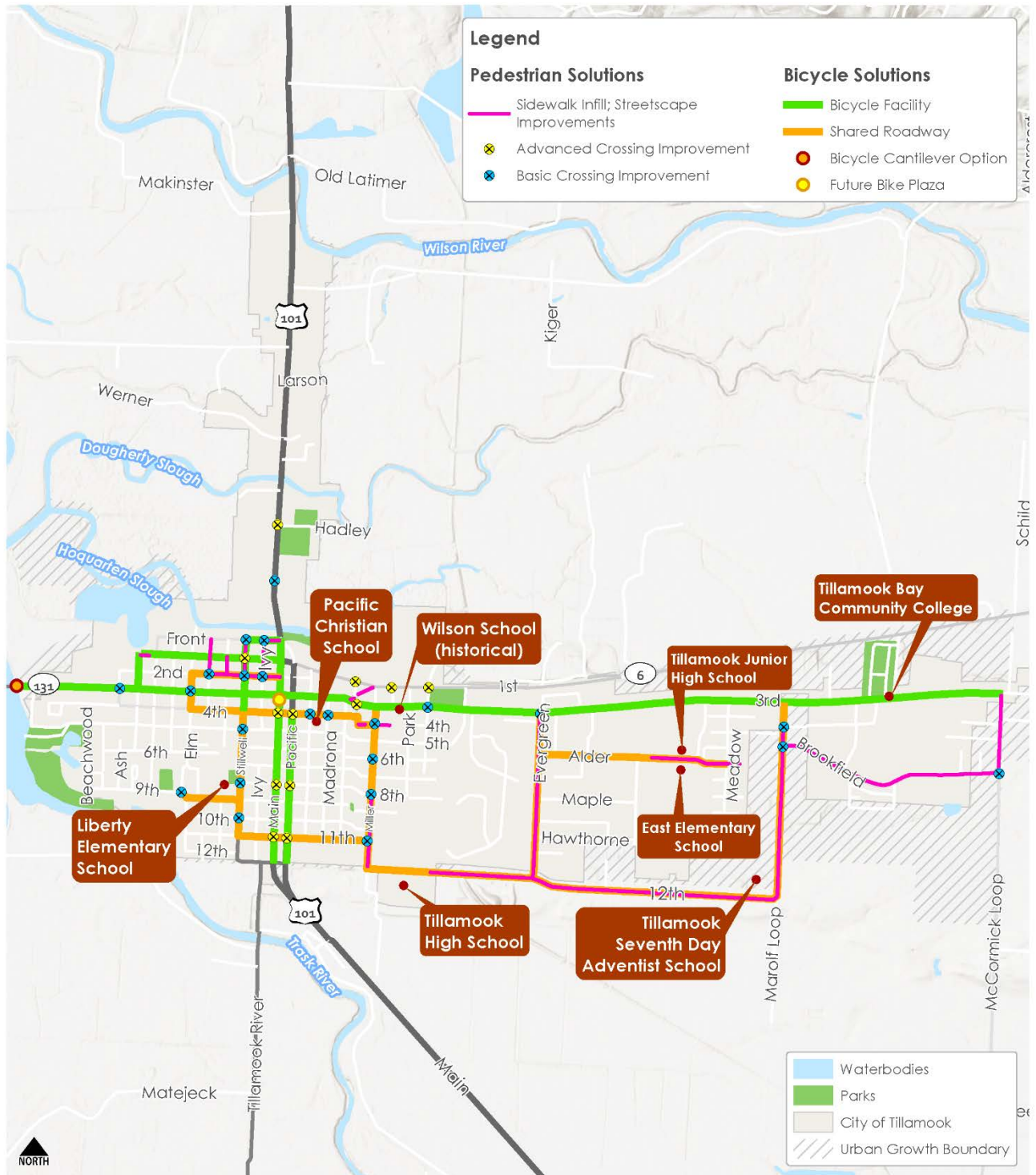
There are seven schools in the City of Tillamook; four are administered by the Tillamook School District, two are private, and the other is the Tillamook Bay Community College.⁹ For the purposes of the solutions evaluation process, improvements to the bicycle and pedestrian system within ¼ mile of any of these schools are considered as being within a school transportation zone. Although these ¼ mile "zones" are not formally designated per SRTS eligibility guidelines, acknowledgement of the transportation networks in the vicinity of school sites (both private and public) was a useful construct in determining transportation system needs and solutions for the City of Tillamook. Given the close distancing of schools, many of these zones clustered to form broader bicycle and pedestrian networks concentrated in Downtown Tillamook and East Tillamook.

All proposed bike and pedestrian solutions were within 1 mile of a public school and therefore potentially eligible to receive SRTS funding. SRTS-eligible projects were assigned a higher priority over all other projects to promote a safe, convenient, and accessible transportation for students travelling to and from school on foot or by bike. The following sections characterize the desired transportation networks within these school transportation zones (Figure 5). Pursuant to ORS 195.115, it is recommended that the City of Tillamook work with Tillamook County School District to develop a Safe Routes to School Action Plan or Safe Route to Schools Infrastructure Plan (OAR 737-025-0060).

⁸ Safe Routes to School National Partnership (2018). Our Mission and Vision. <https://www.saferoutespartnership.org/about/mission>

⁹ Although college campuses are not traditionally included in Safe Routes to School efforts, improved bicycle and pedestrian connections for Tillamook Bay Community College students who access the TBCC campus are considered and prioritized as part of the TSP update.

FIGURE 5. SAFE ROUTES TO SCHOOL-ELIGIBLE BICYCLE AND PEDESTRIAN SOLUTIONS



Safe Routes to School Solutions



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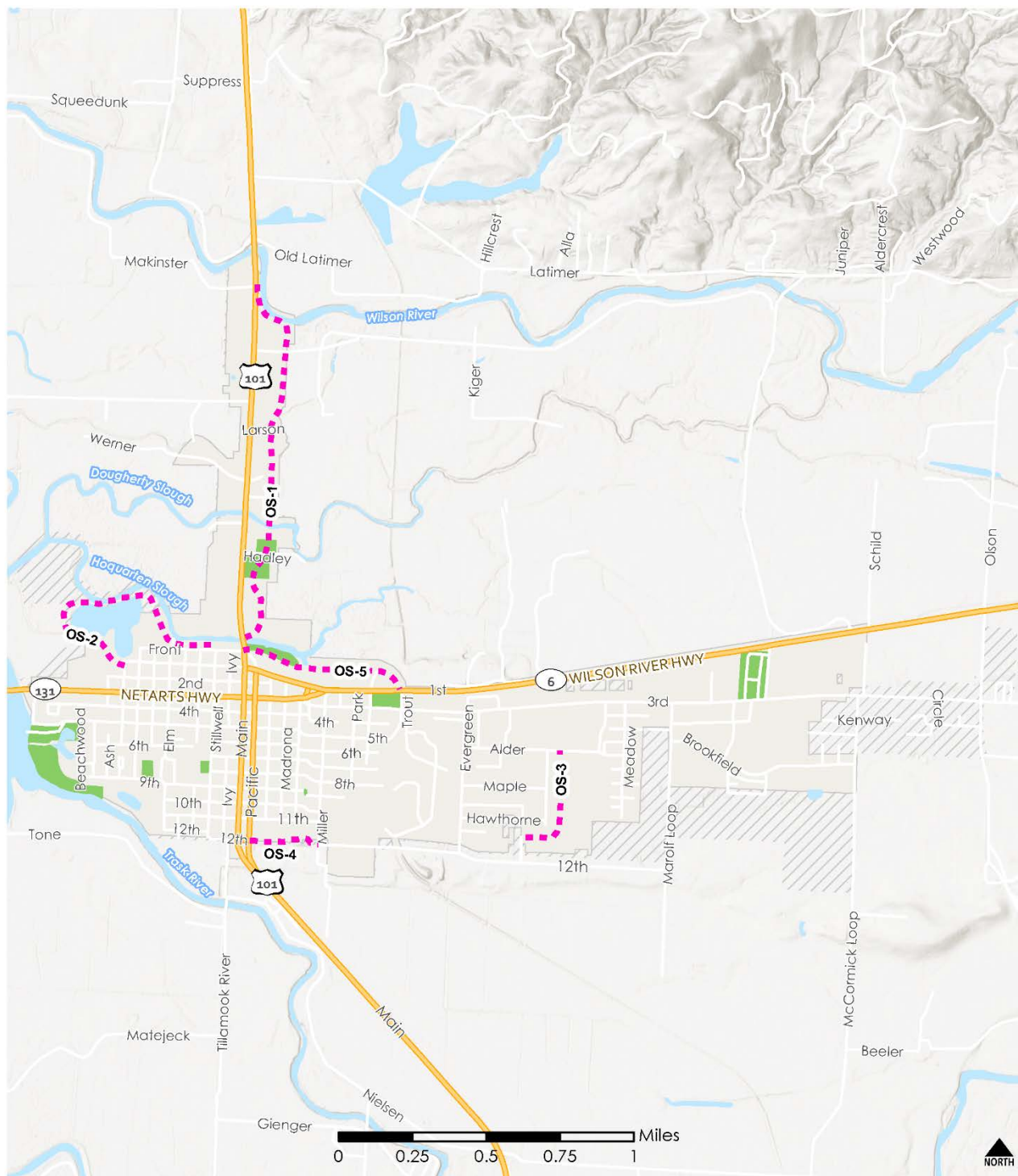
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Note: All projects are within 1 mile of a public school and eligible to receive SRTS funds and given priority in the solutions evaluation process. 1/4 Mile School Transportation Zones are for analysis purposes only.

Off-Street Paths and Trails

City of Tillamook staff have identified a number needed off-street path and trail connections to enhance the pedestrian system in Tillamook, including an off-street trail connection that runs parallel to US-101 from the northern City limits to the Hoquarton Slough, a multi-use loop around Hoquarton Slough in the northwest quadrant of the City, and potential improvements to the Bud Geinger Community Fitness Trail, which follows the perimeter of Tillamook Junior High School (Figure 6). One of these segments identifies a planned shared-use path linking Hoquarton Interpretive Trail and Goodspeed Park, which is under construction as of this writing as part of the Crosstown Connections Project.

FIGURE 6. OFF-STREET PATH AND MULTI-USE TRAIL SOLUTIONS



Off-Street Trail and Multi-Use Path Solutions



City of Tillamook, Oregon
Transportation System Plan

Legend

- Off-Street Bike / Pedestrian Connection
- Highways
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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Off-street path solutions are summarized in Table 6 below.

TABLE 6. OFF-STREET PATH AND MULTI-USE TRAIL SOLUTIONS

Project ID	Location	From	To	Cost	Solution
OS-1	Hadley Fields Crossing - US-101 (parallel route, east of highway)	US-101 north of Hoquarton Slough	US-101 at Wilson River	\$438,000	Off-street connection from Hoquarton Slough to Hadley Fields and Tillamook Creamery north of town
OS-2	Hoquarton Slough perimeter (northwest City limits)	Front Street at Stillwell Avenue	1st Street at Birch Avenue	\$1,039,000	Off-street loop connection around Hoquarton Slough (northwest of downtown)
OS-3	Tillamook Junior High	Tillamook Junior high	12 th Street	\$602,000	Off-street connection between the Bud Geinger Fitness Trail/Tillamook Junior High and 12 th Street
OS-4	12 th Street	12 th Street	US-101/NB Pacific Avenue	\$224,000	Connection from Miller Avenue to US-101/NB Pacific Avenue from Tillamook High School (undeveloped ROW)
OS-5	Salmonberry Trail Improvements (TBD) ¹⁰	Hoquarton City Park	US-101	\$629,000	Crosstown Connection will build a link to the Salmonberry Corridor along the southern perimeter of Hoquarton City Park.

Freight System Solutions

Truck Access Alternatives to Hampton Lumber Company

Revisions to the Hampton Lumber Company access have been completed that were identified in the Tillamook Transportation Refinement Plan (2006):

- Develop 3rd Street access
- Site circulation changes to allow 10th Street access and 3rd Street access

No additional ongoing needs related to truck access were identified.

Freight Routes

Potential modifications to existing local/state freight routes will be made in conjunction with the proposed functional class updated include in *Technical Memorandum #10*.

¹⁰ For the purposes of unit-level cost estimation, it is assumed that improvements will include a multi-use path (0.55 miles), right of way acquisition, and Sensitive Area Impact Mitigation.

Roadway, Traffic, and Safety Improvements

System Connectivity

Several projects were evaluated to address roadway connectivity gaps and improve the connectivity of the primary collector and arterial system in Tillamook. Connectivity projects were evaluated to determine the potential to shift traffic from the 3rd Street corridor, which is a critical east-west corridor (and is projected to carry additional future traffic as growth occurs in the eastern area of the city). While these projects were evaluated based on traffic mobility, each connection would provide full multi-modal travel. The connectivity projects were evaluated using the small community forecast tool (travel model) developed for the Tillamook roadway system. In some cases, several alignments were analyzed for a single gap. None of the connectivity projects were individually found to provide significant traffic relief to 3rd Street. Thus, the intention of these projects remains to be a focus on connectivity (providing alternate routes, reducing travel distance, etc.), rather than mobility and congestion relief. Table 7 below summarizes roadway, traffic, and safety solutions identified as part of the TSP update, as well as solutions identified in the 2003 TSP and 2016 Hoquarton Waterfront Plan that have not been implemented but should be considered now.

TABLE 7. ROADWAY SYSTEM SOLUTIONS

Project ID	Solution	Solution Description	Source
R-1	3rd and Evergreen Intersection Improvement	3rd and Evergreen Drive Intersection Improvement – Three (3) alternatives: 1) Roundabout; 2) Signal and Single Lane Approach; 3) Two-Way Left Turn Lane	TSP Update (2018)
R-2	3rd and Marolf Loop Road Intersection Improvement	3rd and Marolf Loop Road Intersection Improvement – Three (3) alternatives: 1) Roundabout; 2) Signal and Single Lane Approach; 3) Two-Way Left Turn Lane	TSP Update (2018)
R-3	5th to Alder Street Extension	Enhance 5 th Street collector street connectivity by extending 5 th Street across northern end of Hampton Lumber Company site, connecting to Alder.	TSP Update (2018)
R-4	Dogwood to Brookfield Street Extension	Enhance 5 th Street collector street connectivity by extending Dogwood to Brookfield.	TSP Update (2018)
R-5	McCormick to Trask River Street Extension	Enhance 5th Street collector street connectivity by extending Brookfield from McCormick to Trask River Street.	TSP Update (2018)
R-6	1st/3rd Couplet	Create a one-way couplet system along 1 st Street (westbound and Netarts Highway (131) (3 rd Street) (eastbound) between Stillwell Avenue and US-101 (Main Avenue). Project includes signing, channelization/restriping and intersections signal equipment and timing modifications.	Tillamook TSP (2003)

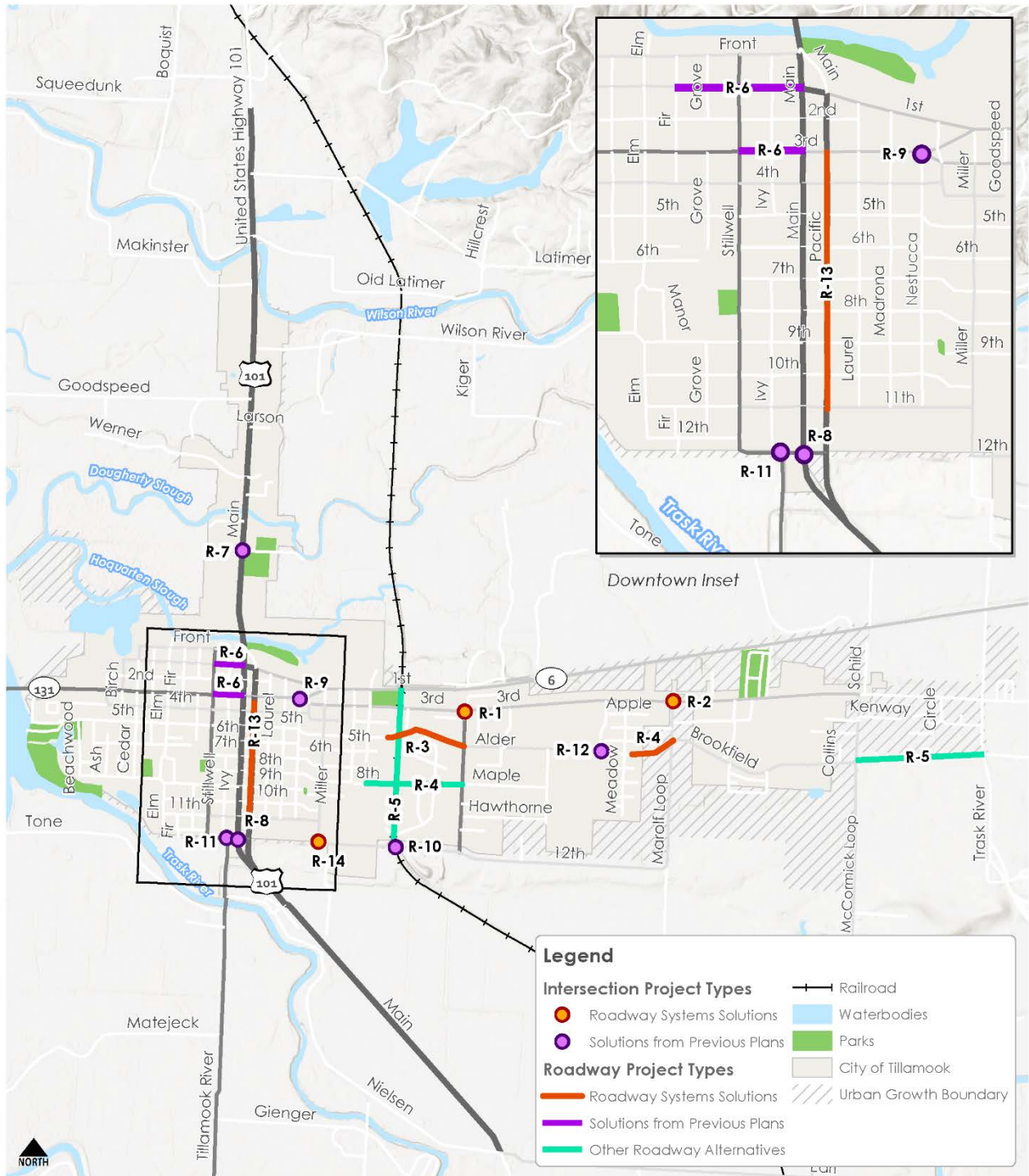
R-7	US-101/ Hadley Access Control	Consolidate driveways near intersection of US-101 and Hadley Road and provide a median barrier to restrict the driveways near the intersection to right-in right-out	Tillamook TSP (2003)
R-8	US-101 / 12th Street	Realign 12 th Street and US-101 (Pacific Avenue)	Tillamook TSP (2003)
R-9	Ocean Place Roundabout	Construct a roundabout at Ocean Place and 3 rd and 4 th Streets, and realign approaches. Provide advanced signing and striping to provide safe operating conditions.	Tillamook TSP (2003)
R-10	12th Street Rail Crossing	Upgrade 12 th Street railroad crossing with safety measures, such as gate and flashing lights. First step would be study by ODOT rail.	Tillamook TSP (2003)
R-11	12th Street / Tillamook River Road	12 th Street and Tillamook River Road – relocate stop bar to provide better sight distance	Tillamook TSP (2003)
R-12	Alder Street/Cypress Street	Redesign the intersection at Alder Lane and Dogwood and Cypress Streets to remove the parking area (or revise to not interfere with intersection operations), provide all-way, stop-controlled intersection. Provide shoulder along east side of intersection for pedestrians and revise crosswalk locations.	Tillamook TSP (2003)
R-13	US-101/NB Pacific Avenue Speed Signs	Install speed feedback signs on US-101/NB Pacific Avenue	TSP Update (2018)
R-14	12th Street/Miller Avenue Safety Study	Conduct safety study at 12 th Street and Miller Avenue	TSP Update (2018)

Roadway system solutions are also summarized in Figure 7 below.

12th Street Corridor

The 12th Street corridor is a minor collector that extends from Miller Avenue to Marolf Loop Road and provides an alternative route for east-west travel to 3rd Street. Several potential extensions and modifications to the corridor were analyzed to determine potential benefits to traffic mobility. Extending 12th Street directly east from its current terminus at Marold Loop Road is not feasible since this would be located outside the urban growth boundary (UGB). An extension located approximately 500 feet to the north (along the southern UGB boundary) could provide a connection to McCormick Loop Road as these properties develop. This connection could be further enhanced for east-west travel by realigning the current 12th Street segment to the north at Marolf Loop Road (which would require right of way of developed property). However, neither improvement would carry significant traffic (due in part to limited connection to downtown) and the future connection may more appropriately serve as local access rather than collector level east-west connectivity.

FIGURE 7. ROADWAY SYSTEM SOLUTIONS



Roadway System Solutions



City of Tillamook, Oregon
Transportation System Plan

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Three potential alignments were evaluated for extending the western terminus of 12th Street from Miller Avenue to Pacific Avenue (R-7). These alignments included:

- Due west connection (through wetland)
- North realignment (realign 11th Street to 12th Street)
- South extension (extend 12th Street south of the wetland to reduce cost)

The due west connection has the greatest potential to shift traffic and would carry approximately 250 vehicles in each direction during the p.m. peak hour. However, any potential relief to 3rd Street is not likely to be experienced east of Evergreen Drive and may add traffic to Evergreen Avenue, increasing delay at the intersection of 3rd/Evergreen.

The realignment of 11th Street with 12th Street to facilitate east-west travel would not shift significant traffic from 3rd Street (less than 50 vehicles each direction during the p.m. peak hour). Therefore, the minor benefits provided by this project would be outweighed by the cost and right of way impacts.

The south extension of 12th Street would likely be a lower cost option since the wetland could generally be avoided. The extension could also provide an opportunity for creating a gateway to downtown south of the couplet. However, the alignment south of the wetland would fall outside the UGB and would not likely be feasible. Therefore, none of the western extensions to 12th Street were advanced as recommendations.

Mill Site Connectivity

Several connections through the mill site were evaluated to determine potential long-term traffic benefits if the property redevelops. These connections included east-west extensions of 5th Street and 8th Street, as well as a north-south route (generally located between Evergreen Drive and Miller Avenue). Both a 5th Street and 8th Street extension would carry similar traffic loads (approximately 50 to 100 vehicles each direction during the p.m. peak hour) and would draw traffic from both 3rd Street and 12th Street. The 5th Street connection would be the more likely collector-alignment candidate, as it could intersect Evergreen Drive at Alder Lane (an existing minor collector) and extends through the western portion of downtown (whereas 8th Street terminates at Stillwell Avenue). Further, the 5th Street extension could be part of a long-range east-west collector enhancement that connects to the existing Alder Lane and Brookfield Avenue segments.

A north-south connection through the mill site could provide better connectivity for future development and reduce reliance on Miller Avenue and Evergreen Drive. However, the utility of such a connection would be limited to local access since there are no potential connections south of 12th Street or north of 3rd Street.

5th Street Collector Corridor

In addition to potential future connectivity through the mill site, several other segments were identified as potential gaps that could be filled in a future east-west collector route. These connections include:

- (R-2) Meadow Avenue (at Dogwood Avenue) to Marolf Loop Road (at Brookfield Avenue) – This connection would require additional right of way of developed properties.
- (R-11) Marolf Loop Road to Olson Road – A direct east connection from the existing terminus of Brookfield Avenue would require structure to span the wetland. Alternatively, a local street connection to the north would provide similar mobility benefit.

These connections would individually provide limited mobility benefit for east-west travel. However, as part of a broader strategy for the 5th Street collector corridor, these connections (along with connectivity through the mill site) could provide an alternate route to 3rd Street. This broader corridor strategy (including considerations for intersection control and stop sign configuration) could shift approximately 50 to 200 vehicles each direction from 3rd Street, with higher shifts occurring just east of downtown.

While there is a benefit to providing the full collector corridor, disjointed individual improvements will have limited benefit due to the following challenges:

- Limited speed – Alder Lane is fronted by schools and the gap connecting to Brookfield Avenue has residential frontage, while 3rd Street is a higher speed facility.
- Connectivity to downtown – The existing 3rd Street alignment provides direct connection to downtown, including signalized intersections along the US-101 couplet, which facilitate east-west travel. The 5th Street intersections at stop controlled at the couplet.
- Potential draw – Limited vehicles travel the full distance from downtown to Olson Road. Therefore, traffic shifting from 3rd Street to 5th Street is drawing from a limited pool of travelers, though there are more potential travelers that could shift nearer to downtown along the western portion of the corridor.

Therefore, the corridor connections should be pursued as opportunities occur to improve the comprehensive network connectivity. However, realizing the full mobility benefits from a full 5th Street collector corridor likely be a lengthy process, due to the number of gaps that need to be filled, including those through existing development that will constrain the timing of completion.

OR-6 Connectivity Alternatives

Several potential connections to OR-6 between Miller Avenue and McCormick Loop Road were analyzed to determine potential mobility benefits. Each connection would provide only localized traffic relief and would not provide significant relief to 3rd Street or other corridors. The following connection alternatives were analyzed:

- Evergreen Drive full access (all turn movements allowed at OR-6)
- Evergreen Drive partial access (only allow right turns)
- Marolf Loop Road full access
- Marold Loop Road partial access

None of the connections are recommended due to the limited traffic relief provided by each connection.

3rd/Evergreen Mobility Improvements

Future (2040) PM peak hour traffic operations were evaluated at 20 study intersections and only one intersection failed to meet mobility standards. The intersection of 3rd Street/Evergreen Drive would operate at LOS F on the northbound approach, which exceeds the mobility standard of LOS D. To mitigate this future deficiency, several TSMO alternatives were analyzed and summarized in Table 8.

As previously listed, adding a northbound left turn lane would not adequately address the approach delay and the approach would continue to operate at LOS F. Widening 3rd Street to include a central two-way left turn lane (TWLTL) would allow traffic turning left from Evergreen Drive to make a two-stage left turn, turning first into the median refuge on 3rd Street and then pulling into westbound traffic

flow as a second movement. This improvement would allow the intersection to meet mobility targets of LOS D. Note that adding a northbound left turn lane along with the TWLTL would not provide significant additional benefit. Upgrading the intersection traffic control to a traffic signal or a roundabout would allow the intersection to operate with lower delay and LOS B. However, due to the low traffic volumes at the intersection, a traffic signal may not be warranted until additional growth. Under future 2040 conditions, this intersection would meet peak hour signal warrants¹¹. This intersection should continue to be monitored for future traffic control improvements.

TABLE 8. POTENTIAL MITIGATIONS FOR 3RD STREET/EVERGREEN DRIVE

Alternative	Mobility Standard	LOS	V/C Ratio
Future No Build	LOS D	F	1.31
Northbound Left Turn Lane	LOS D	F	1.24
Center Two Way Left Turn Lane on 3 rd Street	LOS D	D	0.57
Northbound Left Turn Lane and Center Two Way Left Turn Lane on 3 rd Street	LOS D	D	0.51
Traffic Signal	LOS D	B	0.71
Note: LOS and v/c ratio are reported for the worst movement for unsignalized intersections and for the intersection overall for signalized intersections			

3rd/Marolf Mobility Improvements

The 3rd Street/Marolf Loop Road intersection did not exceed the v/c standard ($v/c \leq 0.85$) cited in the Future (2040) PM peak hour traffic operations analysis. However, this intersection would operate at LOS E on the northbound approach, which exceeds the City's mobility standard of LOS D. To mitigate this potential future deficiency, several TSMO alternatives were analyzed and summarized in Table 9.

As with 3rd Street/Evergreen Drive, adding a northbound left turn lane would not adequately address the approach delay and the approach would continue to operate at LOS E. Widening 3rd Street to include a central two-way left turn lane (TWLTL) would allow traffic turning left from Marolf Loop Road to make a two-stage left turn, turning first into the median refuge on 3rd Street and then pulling into westbound traffic flow as a second movement. This improvement would allow the intersection to meet mobility targets of LOS D. Note that adding a northbound left turn lane along with the TWLTL would not provide significant additional benefit. Upgrading the intersection traffic control to a traffic signal or a roundabout would allow the intersection to operate with lower delay and LOS A. However, due to the low traffic volumes at the intersection, a traffic signal may not be warranted until additional growth occurs. Under future 2040 conditions, this intersection would meet peak hour signal warrants¹². This intersection should continue to be monitored for future traffic control improvements.

TABLE 9. POTENTIAL MITIGATIONS FOR 3RD STREET/MAROLF LOOP ROAD

Alternative	Mobility Standard*	LOS	V/C Ratio
Future No Build	LOS D	E	0.67
Northbound Left Turn Lane	LOS D	E	0.56
Center Two Way Left Turn Lane on 3 rd Street	LOS D	C	0.39
Traffic Signal	LOS D	A	0.58

¹¹ Per the Peak Hour (70% Factor) Warrants in the Manual on Uniform Traffic Control Devices (MUTCD)

¹² Per the Peak Hour (70% Factor) Warrants in the Manual on Uniform Traffic Control Devices (MUTCD)

Safety Improvements

Many of the safety needs were identified at locations along the US-101 couplet that are currently being rebuilt. These areas should continue to be monitored to determine if the needs have been resolved or if any new issues arise.¹³

The intersection of Evergreen Drive/3rd Street was identified as having a high excess proportion of turn crashes. The mobility solutions that reduce delay at this intersection would likely resolve drivers trying to turn when sufficient gaps are not present.

There is also a need for speed feedback signs on US-101/NB Pacific Avenue entering the southern City limits.

Although not identified from the collision analysis, community members brought up a safety issue at 12th Street/Miller Avenue. In addition to the offset geometry of the intersection and pedestrian activity, members of the community reported frequent “near-misses” at this location. Since near-misses do not result in a crash, such occurrences are not observed when reviewing crash data. Additional review and observations at the intersection as part of a future safety study could refine needs at this location and appropriate treatment (if needed). A follow up intersection safety study is recommended at this location to assess the potential safety needs in greater detail.

Policies

As property located along state highways redevelop, consider opportunities for access consolidation or shared access to reduce connections and improve access spacing.

Transit Solutions

The TCTD Transit Development Plan (TDP) provides the basis for public transportation solutions in Tillamook. The TDP proposed a suite of near and longer-term improvements to support the transit system in the City. Transit solutions are summarized in the table below, which were developed through a combination of stakeholder input, an analysis of transit needs within Tillamook, and carrying forward longer-term recommendations originally introduced in the TDP.

TABLE 8. TCTD PUBLIC TRANSPORTATION SOLUTIONS

Route Number	Route Name	Solution Type	Description	Priority
N/A	N/A	Service Coverage	Consider expanding Routes 3 and 4 to include popular deviated fixed route destinations	Medium
N/A	N/A	Service Coverage	Add more stops in Tillamook, Nehalem, and Manzanita	Medium

¹³ The intersection of US 101 / Wilson River Loop was identified as having a high proportion of turn crashes and being located on a top 10% SPIS site. Individual crash records at this location will be reviewed to determine a potential solution.

Route Number	Route Name	Solution Type	Description	Priority
N/A	N/A	Service Coverage	Add new service to Mohler/Highway 53 and Neah-Kah-Nie	High
N/A	N/A	Service Coverage	Add or increase service to key community destinations, such as the Tillamook PO, YMCA, and VA Clinics	High
N/A	N/A	Service Frequency	Increase service frequency to heavily-trafficked areas on north-south routes	Medium
1	Tillamook Town Loop	Service Coverage	Expand local fixed route service within the City limits. Currently, Route 1 is the only city-specific route.	High
1	Tillamook Town Loop	Service Frequency	Provide earlier morning and later evening service	Medium
2	Tillamook – Oceanside – Netarts	Service Frequency	Increase frequency between PM peak travel period	Medium
3	Tillamook – Manzanita – Cannon Beach	Service Frequency	Increase mid-day service and extend evening hours	Medium
4	Tillamook – Lincoln City	Service Coverage	Provide fixed-route bus service to the Port of Tillamook Bay, Woods (Route 4)	High
4	Tillamook – Lincoln City	Service Frequency	Provide earlier service to shelters in Hebo, Cloverdale, and Beaver	Medium
5	Tillamook – Portland	Service Coverage	Provide connections to Beaverton and Hillsboro (Route 5)	High
6	Coastal Connector	Service Frequency	Extend service hours to Lincoln City, Salem, and Grande Ronde	Medium

Source: Tillamook Transit Development Plan (2016)

Policies

As part of the 2003 TSP process, TCTD provided county-level policy recommendations that are applicable to public transportation services in Tillamook. Policy recommendations are broad-based and include a mix of and long-term investment strategies to operate, maintain, and invest in public transportation services on an on-going basis. The following table carries forward County-level TCTD policy recommendations to improve public transportation service that may have not yet been implemented but should be considered now.

TABLE 9. POTENTIAL POLICIES/PROJECT IDEAS TO CARRY FORWARD FROM 2003 TSP

Solution Type	Solution Type	Description	Priority
Policy	Route expansion policy	Provide annual incremental route expansion	High

Program	Connectivity/Intercity Services	Improve connections and ongoing coordination with NW Connector System and Greyhound	High
Policy	Transit pull-outs	Provide transit pull-outs on state and county facilities	Medium
Program	Transit shelter enhancements	Add additional shelters at stops where there are none	High
Project	Additional services at 2 nd Street/Laurel Avenue transit center stop	Provide bike racks	Medium
Program	Advertising Program	Advertise and promote TCTD Services	Medium
Program	TDM Programs	Coordinate TCTD, ODOT, and Tillamook County efforts to explore the need for implementing TDM measures, such as carpooling and vanpooling in the County.	Medium

Solutions Evaluation

This section provides a summary of project solutions and evaluates them with respect to the criteria established in *Technical Memorandum #4: Goals and Objectives*. Project evaluation criteria are shown below in Table 12. Table 13 provides an evaluation of the projects with respect to these criteria, a recommendation for inclusion in the final TSP, and a proposed priority level. There are multiple evaluation criteria for each goal area; Table 12 includes a summary evaluation for the relevant criteria associated with each goal. Projects are scored based on a “Consumer Reports” style system, as shown below:

- Project fully meets criteria
- ◐ Project partially meets or is neutral (neither beneficial nor harmful) with respect to the criteria
- Project does not meet criteria
- N/A Criterion is not applicable to the project

Projects are prioritized by timeframe for implementation: “short term (0 – 5 years),” “medium term (5 – 10 years),” and “long term (beyond 10 years).” The evaluation and prioritization recommendations will be reviewed and revised based on feedback from the PMT, the PAC, and the public prior to completing the TSP.

TABLE 10. PROJECT EVALUATION CRITERIA

TSP Goal	Criteria
Goal 1: Coordination	Is consistent with local, state, and federal plans and policies
	Supports the City’s land use vision
Goal 2: Safety	Improves transportation safety
	Improves crossing safety (rail, pedestrian, etc.)
	Enhances emergency preparedness/community resiliency

Goal 3: Livability and Economic Vitality	Improves or provides access to key destinations (e.g., parks, downtown)
	Addresses parking issues in downtown
Goal 4: Accessibility and Connectivity	Enhances the active transportation or transit network
	Improves facilities for those using mobility devices
Goal 5: Mobility	Enhances mobility for all modes
	Addresses known access issues on state highways or major arterials
Goal 6: System Preservation	Preserves or maintains existing transportation facilities
Goal 7: Public Transportation	Enhances public transportation services (e.g., new routes, shelters)
	Improves bicycle and pedestrian connections to public transportation stops
Goal 8: Bicycle and Pedestrian Facilities	Enhances bicycle and pedestrian facilities within and to downtown
	Enhances bicycle and pedestrian facilities to schools
	Develops new trails or connects to trails, in accordance with local trail plans
Goal 9: Environment	Minimizes impacts to natural resources
Goal 10: Funding	Is cost effective
	Could be eligible for multiple federal, state, or local funding or financing programs

TABLE 11. SOLUTIONS EVALUATION SUMMARY

Project	Goal 1: Coordination	Goal 2: Safety	Goal 3: Livability & Economic Vitality	Goal 4: Accessibility and Connectivity	Goal 5: Mobility	Goal 6: System Preservation	Goal 7: Public Transportation	Goal 8: Bicycle and Pedestrian Facilities	Goal 9: Environment	Goal 10: Funding	Project Cost	Recommend for TSP?	Proposed Priority	Notes
Pedestrian System														
Basic Crossing Improvements (C-1)	◐	●	◐	◐	◐	◐	◐	●	◐	●	\$550,000	Yes	Short/ Medium	There are 23 basic crossing improvements proposed; these improvements are evaluated and prioritized as a bundle. However, it is not expected that all crossing improvements would be constructed as part of the same project or at the same time.
Advanced Crossing Improvements (C-2)	◐	●	◐	●	◐	◐	◐	●	◐	●	\$492,000	Yes	Short	There are 12 advanced crossing improvements proposed; these improvements are evaluated and prioritized as a bundle. However, it is not expected that all crossing improvements would be constructed as part of the same project or at the same time. Further analysis could determine a higher level of investment of pedestrian signalization is required at a given location.
Sidewalk Infill, Construction, and Streetscaping Improvements (P-1 through P-11)	◐	●	◐	●	●	○	◐	●	●	◐	\$2,607,000	Yes	Short – Long	There are 16 proposed sidewalk infill, construction, and streetscaping improvements, including 6 infill and streetscaping projects carried over from the Hoquarton Waterfront Plan (2016). Sidewalk connectivity is prioritized in SRTS zones and in East Tillamook where the greatest gaps exist. Lower priority infill projects can be implemented over time.
Bicycle System														
Shared Roadway Improvements (B-1)	◐	◐	◐	◐	◐	●	◐	●	◐	●	\$136,000	Yes	Medium	The 11 shared roadway segments discussed in this memo comprise improvement to the majority of Tillamook’s bicycle network. As such, they are all evaluated as a single project here, but may be constructed at different times as part of other projects. These improvements have a relatively low cost on a per mile basis.
OR-131: Trask River to McCormick Loop (B-2) Separated Bike Facility	◐	◐	◐	●	●	●	◐	●	◐	◐	\$150,000- \$428,000 ¹⁴	Yes	Short	This project will provide a continuous on-street bike facility on OR-131/3 rd Street, creating a needed east-west neighborhood connection and enhanced bicycle access to Tillamook Regional Medical Center, the proposed off-street multi-use path around the perimeter of the Hoquarton Slough, Tillamook Bay Community College, Tillamook Junior High School, East Elementary School, and Tillamook Seventh Day Adventist School.

¹⁴ The cost range associated with this project reflects a low-build scenario (paint markings, substandard bike lane width) and a full-build scenario (includes estimated cost required to widen shoulders to achieve standard bike lane width). If shoulder widening is not elected for the final project, the substandard bike lanes may need to be deployed in select locations.

Project	Goal 1: Coordination	Goal 2: Safety	Goal 3: Livability & Economic Vitality	Goal 4: Accessibility and Connectivity	Goal 5: Mobility	Goal 6: System Preservation	Goal 7: Public Transportation	Goal 8: Bicycle and Pedestrian Facilities	Goal 9: Environment	Goal 10: Funding	Project Cost	Recommend for TSP?	Proposed Priority	Notes
US-101 Separated Bike Facilities (B-3) Main – Front Street to 12th St Pacific - 4th St to 12 th St	◐	●	●	●	●	●	N/A	●	◐	◐	\$28,000 - \$65,000 ¹⁴	No	N/A	This project will provide a needed minimum level of separation between bicycles and motor vehicles along US-101, creating an enhanced north-south connection for bicyclists travelling through downtown Tillamook.
1st Street – Birch to Main Street (B-4) Separated Bike Facility	◐	●	●	●	●	●	N/A	●	◐	◐	\$21,000- \$65,000 ¹⁴	Yes	Short	This project provides a needed east-west bicycle connection as an alternative to travelling along OR-131/3 rd Street. This project also connects to a potential off-street path around the Hoquarton Slough.
Birch Street – 1st Street to Main Avenue (B-5) Separated Bike Facility	◐	●	●	●	●	●	N/A	●	◐	◐	\$6,000- \$8,000 ¹⁴	Yes	Short	This project connects the proposed bike lanes on 1 st and 4 th Streets, providing a bike linkage to the potential off-street connection around the Hoquarton Slough and the Trask River at the west end of town.
Front Street – Main Avenue to Stillwell Avenue (B-6)	◐	●	●	●	●	●	N/A	●	◐	◐	\$6,000- \$8,000 ¹⁴	Yes	Short	This project provides an on-street bike connection between the two proposed off-street connections near Sue H. Elmore Park and the Hoquarton Slough. This connection also provides east-west and north-south access through downtown Tillamook.
Stillwell Avenue – 4th to Front Street (B-7) Separated Bike Facility	◐	●	●	●	●	●	N/A	●	◐	◐	\$11,000- \$23,000 ¹⁴	Yes	Short	This project recommends a separated bicycle facility north of 4 th Street, creating a north-south connection on Stillwell Avenue to Hoquarton Slough. This bike lane would also connect to potential off-street improvements along the southern front of Sue H. Elmore Park and future Salmonberry Trail Improvements.
Bicycle Plaza: Vicinity of 4 th and Main Street	◐	◐	◐	●	◐	○	N/A	●	◐	●	Approx. \$8,000 - \$12,000 ¹⁵	Yes	Medium	Assumes tubular bike rack for 8-12 bicycles and overhead shelter.
OR-131 Bridge - Bicycle Cantilever over Trask River	●	●	◐	●	●	○	N/A	●	○	○	TBD	No	N/A	Discuss option for cantilevering bikes off the bridge; conditional on replacement/adequate widening of the bridge to accommodate bicyclists. This project is not recommended due to the likely high cost of retrofitting the bridge; bike lanes and pedestrian facilities should be considered during design of the eventual replacement for the structure.

¹⁵ Based on [Staten Island Bicycle Parking Hardware Options Report](#) (1998), published by Staten Island Bicycle Parking at Transit. Unit cost information assumes standard covered bike parking for less than 12 bicycles.

Project	Goal 1: Coordination	Goal 2: Safety	Goal 3: Livability & Economic Vitality	Goal 4: Accessibility and Connectivity	Goal 5: Mobility	Goal 6: System Preservation	Goal 7: Public Transportation	Goal 8: Bicycle and Pedestrian Facilities	Goal 9: Environment	Goal 10: Funding	Project Cost	Recommend for TSP?	Proposed Priority	Notes
Off-Street Trail and Multi-Use Path Improvements														
Hadley Fields Crossing (OS-1) Hoquarton Waterfront Park and US-101	◐	●	●	●	●	○	N/A	●	◐	◐	\$438,000	Yes	Short - Medium	Project provides a north-south connection from Hoquarton Park to the Wilson River adjacent to US-101. The route passes through Hadley Fields and provides increased recreational opportunities for local and touring pedestrians and cyclists. The project can also enhance the City’s portion of the Oregon Coastal Bike Route.
Hoquarton Slough Perimeter (OS-2) Front St at Stillwell to 1st St at Birch	◐	●	◐	●	◐	◐	N/A	●	◐	◐	\$1,039,000	Yes	Long	This project will formalize an existing demand path around the perimeter of the Hoquarton Slough just northwest of downtown Tillamook. The project increases off-street recreational opportunities for local and touring pedestrians and cyclists.
Tillamook Junior High to 12th Street (OS-3)	◐	●	◐	●	●	○	N/A	●	○	◐	\$602,000	Yes	Long	Off-street pedestrian connection from Dogwood Avenue to 12 th Street through wetland area to the south. Includes potential Sensitive Wetland Area mitigation costs and a pedestrian bridge to minimize environmental impacts.
12th Street Off-Street Connection (OS-4) Tillamook High School to Pacific Avenue	◐	●	●	●	◐	○	N/A	●	○	◐	\$224,000	Yes	Long	This project proposes an off-street extension of 12 th Street through wetland area to connect Miller Avenue to US-101 NB Pacific Avenue. Includes potential Sensitive Wetland Area mitigation costs and a pedestrian ramp to minimize environmental impacts.
Salmonberry Trail Improvements (OS-5)	◐	●	●	●	◐	○	N/A	●	●	◐	\$629,000	Yes	Short - Medium	This project proposes an enhanced off-street pedestrian/bicycle link between Hoquarton Park and US-101 to facilitate future connections to the Salmonberry Trail. Project assumes no wetland impacts or structures needed.
Roadway Projects														
3rd and Evergreen Drive Intersection Improvement (R-1) – Alternative 1 Roundabout	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$758,000	No	N/A	There are 3 intersection improvement alternatives to improve mobility and safety at the intersection at 3 rd Street and Evergreen. This alternative improves mobility, but at a high cost.
3rd and Evergreen Drive Intersection Improvement (R-1) – Alternative 3 Two-Way Left Turn Lane	◐	●	◐	◐	●	○	N/A	◐	○	○	\$234,000	Yes	Long	This alternative provides the greatest mobility benefit at the lowest cost.
3rd and Evergreen Drive Intersection Improvement (R-1) – Alternative 2 Signal and Single Lane Approach	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$563,000	No	N/A	This alternative would improve mobility, but at a relatively high cost.

Project	Goal 1: Coordination	Goal 2: Safety	Goal 3: Livability & Economic Vitality	Goal 4: Accessibility and Connectivity	Goal 5: Mobility	Goal 6: System Preservation	Goal 7: Public Transportation	Goal 8: Bicycle and Pedestrian Facilities	Goal 9: Environment	Goal 10: Funding	Project Cost	Recommend for TSP?	Proposed Priority	Notes
3 rd and Marolf Loop Road Intersection Improvement (R-2) – Alternative 1 Roundabout	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$758,000	No	Long	There are 3 intersection improvement alternatives to improve mobility and safety at the intersection at 3 rd Street and Marolf Loop Road. This alternative improves mobility, but at a high cost.
3 rd and Marolf Loop Road Intersection Improvement (R-2) – Alternative 3 Two-Way Left Turn Lane	◐	●	◐	◐	●	○	N/A	◐	○	○	\$234,000	Yes	Long	This alternative provides the greatest mobility benefit at the lowest cost.
3 rd and Marolf Loop Road Intersection Improvement (R-2) – Alternative 2 Signal and Single Lane Approach	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$563,000	No	Long	This alternative would improve mobility, but at a relatively high cost.
5th to Alder Street Extension (R-3)	◐	○	○	◐	◐	○	○	○	○	○	\$2,763,000	No	N/A	There are 3 proposed roadway extension projects. These projects are not recommended as part of the TSP, as potential mobility/connectivity benefits do not justify the high cost per mile and impacts to the community. Alternatively, connectivity could be achieved incrementally through development
Dogwood to Brookfield Street Extension (R-4)	◐	○	○	◐	◐	○	○	○	○	○	\$1,789,000	No	N/A	
McCormick Loop to Trask River Street Extension (R-5)	◐	○	○	◐	◐	○	○	○	○	○	\$3,423,000	No	N/A	
1 st /3 rd Couplet (R-6)	◐	◐	◐	◐	●	○	N/A	◐	○	○	\$170,000*	Yes	Long	Create a one-way couplet system along 1 st Street (westbound and Netarts Highway (131) (3 rd Street) (eastbound) between Stillwell Avenue and US-101 (Main Avenue). Project includes signing, channelization/restriping and intersections signal equipment and timing modifications.
US-101/ Hadley Access Control (R-7)	◐	●	◐	○	◐	○	N/A	◐	○	○	\$85,000*	Yes	Long	Consolidate driveways near intersection of US-101 an Hadley Road and provide a median barrier to restrict the driveways near the intersection to right-in right-out
US-101 / 12 th Street (R-8)	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$425,000*	Yes	Long	Realign 12 th Street and US-101 (Pacific Avenue)
Ocean Place Roundabout (R-9)	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$1,275,000*	Yes	Long	Construct a roundabout at Ocean Place and 3 rd and 4 th Streets, and realign approaches. Provide advanced signing and striping to provide safe operating conditions.
12 th Street Rail Crossing (R-10)	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$425,000*	Yes	Long	Upgrade 12 th Street railroad crossing with safety measures, such as gate and flashing lights. First step would be study by ODOT rail.
12 th Street / Tillamook River Road (R-11)	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$8,500*	Yes	Long	12 th Street and Tillamook River Road – relocate stop bar to provide better sight distance
Alder Street/Cypress Street (R-12)	◐	●	◐	◐	◐	○	N/A	◐	○	○	\$170,000*	Yes	Long	Redesign the intersection at Alder Lane and Dogwood and Cypress Streets to remove the parking area (or revise to not interfere with intersection operations), provide all-way, stop-controlled intersection. Provide shoulder along east side of intersection for pedestrians and revise crosswalk locations.

Project	Goal 1: Coordination	Goal 2: Safety	Goal 3: Livability & Economic Vitality	Goal 4: Accessibility and Connectivity	Goal 5: Mobility	Goal 6: System Preservation	Goal 7: Public Transportation	Goal 8: Bicycle and Pedestrian Facilities	Goal 9: Environment	Goal 10: Funding	Project Cost	Recommend for TSP?	Proposed Priority	Notes
Speed Feedback Signs on US-101/NB Pacific Avenue (R-13)	○	●	○	○	○	○	N/A	○	○	●	\$Approx. \$20,000 ¹⁶	Yes	Short	Speed Feedback Signs on US-101/NB Pacific Avenue
Intersection Safety Study at 12 th Street/Miller Avenue (R-14)	◐	●	◐	◐	◐	◐	N/A	◐	◐	●	\$25,000	Yes	Short	Conduct intersection safety study at 12 th Street/Miller Avenue to identify potential safety improvements

Note: * Cost is indexed for construction cost inflation (70% increase) for cost prepared in 2003 TS

¹⁶ Colorado Department of Transportation (2018). Historical Bid Data. <https://www.codot.gov/business/eema/documents/2018/2018-cost-data-book/view>



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Appendix I

Finance Program



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Finance Program – Final Technical Memorandum #9

July 19, 2018

Prepared for: Paul Wyntergreen, City of Tillamook

Copy to: Ken Shonkwiler, ODOT

Prepared by: Brooke Jordan, CH2M
Ryan Farncomb, CH2M

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Introduction

This memorandum provides an overview of revenue sources and funding and finance mechanisms for the City of Tillamook that could be used to fund future projects identified in the Transportation System Plan (TSP). The memorandum outlines existing revenue and funding sources, levels of funding, and provides an estimate of future transportation revenues. An overview of other funding sources, eligibility, and available funds are presented to identify potential sources of funding that the City could pursue for transportation investments.

Existing Funding Sources

The City's primary sources of transportation revenues includes the state gas tax, local fuel tax, and recently, ODOT Special City Allotment (SCA) Grants, and general fund revenues. Table 1 outlines transportation revenue from various sources from fiscal years 2012 to 2017.

Share of State Gas Tax

The City's allotment of state gas tax revenue has been relatively stable over the last five years except for fiscal year 2014-15, during which the allotment increased by approximately 48 percent over the previous fiscal year. City revenue from state gas tax distributions are likely to remain steady or grow slightly, in real dollar terms, depending on action taken at the state level to increase transportation revenues.

ODOT Special City Allotment Grant

The City was granted ODOT SCA funds in fiscal years 2012-13, 2015-16, and 2016-17. The SCA program is an annual allocation of state funds for local transportation projects in cities with 5,000 or fewer residents. Eligible projects must be on city streets that are not part of a county road or the state highway system. Additionally, SCA funds can only be used on streets that are "inadequate for the capacity they serve or are in a condition detrimental to safety" (ORS 366.805). Some agencies use SCA funds as a local match for larger projects that also meet the intent of SCA. Individual project funding under the SCA program is limited to \$50,000 per project. Cities can request an advance of up to one half (\$25,000). The City of Tillamook may not remain eligible for SCA funds in the future given the population thresholds of the program. As of the 2015 Census, the City had a population of 4,958.

Local Fuel Tax

Tillamook levies a local gas tax of \$0.015 per gallon of gasoline sold within the City. Local fuel tax revenue has marginally increased since fiscal year 2012-13 except for fiscal year 2015-16, during which revenue decreased by 9 percent over the previous fiscal year.

Streets, Storm, Drainage, and Park Fund

The City's Public Works department is largely funded through three separate funds: Water, Sewer, and the "Streets, Storm Drainage, and Park Fund." In each year, the majority of the City's street fund is used for maintenance and roadway preservation. This is a deliberate strategy to maximize the useful benefit of transportation expenditures, since preservation of existing facilities is generally far less costly than investments in large-scale rehabilitation or reconstruction.

TABLE 1. TILLAMOOK GENERALIZED TRANSPORTATION REVENUES (2012-2017)

	2012-13	2013-14	2014-15	2015-16	2016-17
	Actual	Actual	Actual	Actual	Adopted
State Gas Tax	\$179,060	\$187,926	\$277,679	\$281,381	\$281,603
ODOT Special City Allotment Grant¹	\$78,036	--	--	\$50,000	\$100,000*
Local Fuel Tax	\$121,516	\$125,799	\$131,753	\$120,000	\$130,000
Total Transportation Revenues	\$378,612	\$313,725	\$409,432	\$451,381	\$511,603
Total Streets, Storm Drainage, and Parks Fund Revenues	\$797,443	\$1,230,817	\$1,150,446	\$1,512,395	\$2,308,103

Source: City of Tillamook (2017). Total Streets, Storm Drainage, and Parks Fund includes unallocated funds that can be expended on transportation projects.

The City spent approximately \$1.7 million on transportation capital improvements, materials and service, and personnel between fiscal years 2012-13 and 2016-17. Most of these expenditures (88 percent) went to personnel related to transportation system maintenance, with less than 7 percent spent on capital improvements.²

Between 2012 and 2017, the City's Personnel budget has increased from approximately \$294,000 to \$373,000. During the same period, the City's Materials and Services budget increased from approximately \$294,000 to \$480,000. The capital subsection of the Street fund has approximately \$90,000 to fund street and sidewalk maintenance expenses, but fluctuates considerably depending on grant and other external funds. Whenever possible, the City maximizes water and sewer project with accompanying street overlays. Table 2 below summarizes actual reported expenditures between 2012 and 2017.

TABLE 2. TILLAMOOK GENERALIZED TRANSPORTATION EXPENDITURES (2012 – 2017)

	2012-13	2013-14	2014-15	2015-16	2016-17
	Actual	Actual	Actual	Actual	Adopted
Capital Improvements	\$35,311	\$33,618	\$0	\$42,826	\$5,637

¹ ODOT SCA funds for fiscal year 2015-16 were not expended and were subsequently combined with fiscal year 2016-17 SCA funds.

² It is difficult to determine a history of 'street' or other maintenance costs, since the Streets, Storm Drainage, and Parks Fund contains three different elements within its parameters. Therefore, information related to transportation expenditures is based the City's best knowledge and spending assumptions.

Materials & Services	\$4,139	\$5,798	\$9,920	\$64,391	\$4,147
Personnel	\$278,858	\$383,802	\$290,645	\$260,315	\$327,514
TOTAL	\$318,308	\$423,218	\$300,565	\$367,532	\$337,299

Source: City of Tillamook (2017).

Future Revenue Forecast

Table 3 details the estimated revenue the City is likely to have available for capital projects in the next 25 years. This section assesses funds that the City is reasonably expected to continue to accrue; it does not account for one-time capital grants such as those for STIP-eligible projects. The City currently does not have a dedicated fund to implement TSP projects and programs. However, there are other potential dedicated and one-time revenue sources the City could pursue to augment its funds for capital improvement projects and they are discussed in the Next Steps section of this memorandum.

TABLE 3. ESTIMATED FUTURE TRANSPORTATION REVENUE (IN 2017 DOLLARS)

Source	2017	2040	Total over 25-year life of plan	Notes
State and local gas tax revenue	\$41,500	\$41,500	\$1,037,500	The City typically expends on average 11% of its transportation revenue on capital projects. This estimate assumes that the City will continue to have approximately this amount available for capital projects.
SCA Grants	\$100,000	\$0	\$100,000	These funds are available for capital projects. However, Tillamook will likely exceed the population threshold for this grant program and no longer be eligible for funding. This assumes that Tillamook's population will exceed 5,000 by the 2020 Census. Assuming that applicants would reasonably be granted an award every 4 years, this source of funding would no longer be available after 2018.
TOTAL ESTIMATED FUNDS AVAILABLE FOR CAPITAL PROJECTS:			\$1,137,500	

Funding and Finance Options

A variety of established funding sources from federal, state, and local sources are available to fund future transportation projects in the City of Tillamook. Table 4 provides an overview of each funding source, eligible projects, funding dollar amount, funding restrictions, and other considerations.

TABLE 4. FUNDING SOURCES OVERVIEW

Source	Funding \$ Available	Eligibility/Restrictions	Public support/other considerations
Statewide Transportation Improvement Program (includes pass-through federal funds) <i>Enhance</i> <i>Fix-It</i> <i>Local Programs</i> <i>Non-Highway</i> <i>Other Functions</i> <i>Safety</i>	Varies	<p>Many types of projects</p> <hr/> <p>Must be ‘repair’ projects; wide variety of project types accepted</p> <hr/> <p>Varies; direct funding to local governments</p> <hr/> <p>Must be bicycle, pedestrian, public transportation, and transportation options programs</p> <hr/> <p>Funds workforce development, planning, data collection and indirect cost recovery</p> <hr/> <p>Funds projects that reduce serious injury and fatal crashes</p>	For most of these programs, projects must be on federal functionally classified roadways (collector or higher order streets). In most cases, local streets in Tillamook would not be eligible for funding through these programs.
Recreational Trails Program	About \$1.5 million statewide (per year)	Must be a trail project; preference given to “non-transportation” trails	
Federal Lands Access Program (FLAP)	\$36,533,405 (2017)	Projects that improve transportation facilities that provide access to, are adjacent to, or are location within Federal lands.	
ConnectOregon	\$49 million available in 2015-2017 biennium	Many types of projects	
Oregon Immediate Opportunity Fund	Between \$250K and \$2 million, depending on project type	Primarily focused on projects that provide economic development benefits	
Oregon Transportation Infrastructure Bank	Loan amounts vary	Many types of projects	Loans may be controversial, in that their repayment may require city financial resources that could be spent elsewhere
Special City Allotment (SCA) Grants	Up to \$50,000 per project	Many types of projects, with preference given to those projects that remedy safety or capacity issues. Grants available only to cities under 5,000 people.	The City of Tillamook is likely to be ineligible in the future due to population size.

Source	Funding \$ Available	Eligibility/Restrictions	Public support/other considerations
Safe Routes to School (SRTS)	<i>Non-Infrastructure:</i> \$300K annually <i>Infrastructure:</i> \$10 million annually; \$15 million in 2023	Projects that improve, educate, or encourage children safely walking or biking to school.	
Statewide Transportation Improvement Fund	\$115 million annually	Improvements in all types of public transportation service except light rail; Planning, deployment, operation, and administration of STIF projects; Local match for federal transit funds	NW Connector would qualify for funding; the City should coordinate with the transit district to pursue funding for transit improvements.
Local fuel tax	Tillamook currently levies a tax of \$0.015 per gallon	Any city in Oregon can levy a gas tax	Increases in fuel tax can be controversial
Transportation maintenance Fee	Varies	Any city in Oregon can implement a Transportation maintenance fee	These funds are not generally used for capital projects, but free up other resources for capital projects. Potential equity impacts on low-income households
Tax Increment Financing/Urban Renewal Area (URA)	\$294,182 (2016-2017)	Already implemented in Tillamook	
System Development Charges (SDC)	Varies. Depends on type, number, and structure of SDCs and level of development.	Any city in Oregon can implement SDCs	Can be controversial with developer community.
Parking fees	Potential revenue dependent on parking fee rate and amount of parking charged	Downtown is the area most likely suited to charging for parking.	Potentially controversial; depends on how well utilized parking is and any need for demand management.
Bonds	Varies	Factors to consider include the type of bond (revenue or general obligation), city's credit rating, and project scope	General obligation bonds may require significant city resources to repay; revenue bonds require new taxes or fees (like property tax levies) that may be controversial and have disproportionately negative impacts on low income residents.
Local Improvement Districts (LID)	Dependent on size of LID and levy rate	Wide variety of projects could be funded in specific neighborhoods	Usually initiated by property owners. May disproportionately harm low-income home owners.

Federal Grants

Highway Trust Fund

Revenues to the federal Highway Trust Fund (HTF) are comprised of motor vehicle fuel taxes, sales taxes on heavy trucks and trailers, tire taxes and annual heavy truck use fees. HTF funds are split into two accounts – the highway account and transit account. Funds are appropriated to the states annually, based on allocation formulas in the current legislation governing the HTF. Fixing America's Surface Transportation Act (FAST Act) is the current federal transportation program legislation, which became effective December 4, 2015.

FAST Act was the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorized \$305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act, for the first time, provides a dedicated source of federal dollars for freight projects.

Most federal grant monies are distributed by the Oregon Department of Transportation (ODOT) through the Statewide Transportation Improvement Program (STIP). The application process for federal funds is described below in the Statewide Transportation Improvement Program section.

Federal Lands Access Program

The Federal Lands Access Program (Access Program) was established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The Access Program supplements State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators.

The Access Program is funded by contract authority from the Highway Trust Fund and funds are allocated among States using a statutory formula based on road mileage, number of bridges, land area, and visitation. Program funds are subject to obligation limitation. The FAST Act allocated up to \$36,533,405 to Oregon for fiscal year 2017.

Projects are selected by a Programming Decision Committee (PDC) in each state. The PDCs request project applications through a call for projects. Oregon, in addition to Alaska, Idaho, Montana, and Washington comprise the Western Federal Lands. The Western Federal Lands details a program of projects in the *Western Federal Lands Transportation Improvement Plan*. The Oregon PDC 2018 request for proposals is closed as of this writing, but the fiscal year 2019 request for proposals is likely to open in December 2018. More information can be found on the Oregon PDC web page at: <https://flh.fhwa.dot.gov/programs/flap/or/>.

State Grants

State Highway Fund

State funds are distributed by the Oregon Transportation Commission (OTC). Fund Revenues are comprised of fuel taxes, vehicle registration and title fees, driver's license fees and the truck weight-mile tax. State funds may be used for construction and maintenance of state and local highways, bridges and roadside rest areas. State law requires that a minimum of one percent of all highway funds be used for

pedestrian and bicycle projects in any given fiscal year. However, cities and counties receiving state funds may “bank” their pedestrian and bicycle allotment for larger projects.

Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) is the four-year capital improvement program for the state of Oregon. It provides a schedule and identifies funding for projects throughout the state. Projects included in the STIP are generally “regionally significant” and are prioritized by Metropolitan Planning Organizations and Area Commissions on Transportation (ACTs). ACTs are regional advisory bodies, and the relevant ACT for Tillamook is the Northwest ACT. All regionally significant state and local projects and federally-funded projects and programs must be included in the STIP.

Approximately 80 percent of STIP projects use federal funds, most of which originate from FAST Act programs. In addition, Regional Flexible Funds competitive grants are awarded every two years towards bicycle, pedestrian, transit and Transportation Demand Management (TDM) projects and are now included in the STIP. The STIP is the major transportation funding program for most state and federal transportation funds.

The Oregon Transportation Commission approved an allocation of \$2.4 billion for the 2021-2024 STIP. The 2021-2024 STIP diverges from the “Enhance” and “Fix-It” funding categories used in the 2015-2018 program and divided funding into six categories: (1) Enhance Highway, (2) Fix-it, (3) Local Programs, (4) Non-Highway, (5) Other Functions, and (6) Safety. A description of each category is included below:

- **Enhance Highway** – funds projects that expand or enhance the state highway system.
- **Fix-It** – includes all the capital funding programs that maintain or fix the state highway system. Examples of programs within the Fix-It category include, but are not limited to state bridge, pavement, preservation, culverts, and operations.
- **Local Programs** – directs funding to local governments through several different programs.
- **Non-Highway** – funds projects that improve bicycle, pedestrian, public transportation, and transportation options programs. Includes two sub-categories: Discretionary Non-Highway (OTC has discretion over the allocation of funds and Required Non-Highway (allocation required by state or federal legislative mandate).
- **Other Functions** – includes workforce development, planning, data collection and indirect cost recovery using federal resources.
- **Safety** – funds projects that are focused on reducing serious injury and fatal crashes on Oregon’s roads.

The Commission allocated most discretionary funding to Fix-It programs, but also infused the Enhance Highway programs with funding to support improving roads and address growing congestion and freight mobility. ODOT created three leverage programs that provide the opportunity to add features to Fix-It projects: State Highway, Safety, and Active Transportation. In addition to the over \$600 million allocated in House Bill (HB) 2017 for Enhance projects, \$24 million will be directed to the State Highway Leverage program that will allow ACTs to add Enhance features to Fix-It projects. More information on the Statewide Transportation Improvement Program can be found at <http://www.oregon.gov/ODOT/TD/STIP/Pages/default.aspx>.

Eligibility

Only certain streets are eligible to receive federal funds – generally those streets with federal functional classification as “major collector” and higher order streets. US 101, OR-6/Wilson River Highway, US-131/Netarts Highway, and 3rd Street meet this funding criteria. However, STIP projects are also funded

by other sources, meaning some local streets in Tillamook may be eligible under the six funding categories described above. To ensure that Tillamook is involved in the STIP decision-making process and to advocate for projects important to the community, the City should actively participate in the Northwest ACT.

An additional step the City or local school district could take to improve the likelihood of funding through the Non-Highway funding category of the STIP is to complete a Safe Routes to School Action Plan. More information on the Safe Routes to School funding program is included below.

Safe Routes to School Grants (SRTS)

The Oregon Department of Transportation has two main types of Safe Routes to School programs: infrastructure and non-infrastructure. Infrastructure programs focus on making sure safe walking and biking routes exist through investments in crossings, sidewalks and bike lanes, flashing beacons, and the like. The infrastructure program includes three distinct grant programs: (1) Competitive Grant Program, (2) Rapid Response Grant Program, and (3) Project Identification Grant Program. The majority of funds, 87.5 percent or greater, will be allocated to the Competitive Grant Program to build street safety projects and reduce barriers and hazards for children walking or biking to or from schools. Up to 10 percent of funds will be used for urgent needs or systemic safety issues that occur in between Competitive Grant Program cycle. The remaining 2.5 percent will be used by ODOT to help communities identify projects that will lead to eventual construction.

Non-infrastructure programs focus on education and outreach to assure awareness and safe use of walking and biking routes. Investments include developing Safe Routes to School Action Plans, educating students on walking and biking options and how to do use them safely (laws, rules, and guidelines), among other efforts. An approved Oregon Action Plan must be received for every K-8 that is affected by the project proposal at the time of application. The plan initiates evaluation and community involvement activities that prepare the school to seek SRTS projects and activities with other funding sources. The grant requires a 12 percent local match (88 percent federal funds). More information about the SRTS program can be found at <http://www.oregon.gov/ODOT/Programs/Pages/SRTS.aspx>.

The SRTS program has received a new injection of funds from HB 2017 with new funding amounting to \$10 million statewide per year, increasing to \$15 million in 2023. This represents a substantial ongoing source of funds for SRTS capital projects. Project and program eligibility criteria are still under development as of this writing.

Recreational Trails Program

This program is administered by the Oregon Parks and Recreation Department. Recreational Trails Program (RTP) funding is intended for recreational trail projects, and can be used for acquiring land, easements, and building new trails. Grant funds pay up to 80 percent of project costs while project sponsors must match project costs by at least 20 percent. Approximately \$1.5 million in statewide funds are available annually. More information can be found at <http://www.oregon.gov/oprd/grants/Pages/trails.aspx>.

ConnectOregon Program

ConnectOregon provides grants and loans for non-highway transportation projects, backed by bonds on state lottery proceeds. \$49 million in bonds were authorized for the 2015-2017 biennium. The program funds rail, port/marine, aviation, and transit projects. In addition, the legislature mandated that bicycle and pedestrian projects not eligible for State Highway Funds be eligible to compete for ConnectOregon funding. There are several important changes to ConnectOregon resulting from the passage of HB 2017:

- Public transit projects are no longer included in Connect Oregon.
- The Connect Oregon Fund now has a portion of the new vehicle dealer privilege fee and the new \$15 bicycle excise tax in addition to lottery-backed bonds as funding sources. The bicycle excise tax will only go towards bicycle/pedestrian projects.
- The Oregon Transportation Commission is directed to distribute Connect Oregon funds to four specific projects:
 - Mid-Willamette Valley Intermodal Facility (\$25 million).
 - Treasure Valley Intermodal Facility (\$26 million).
 - Rail expansion in East Beach Industrial Park at the Port of Morrow (\$6.55 million).
 - Brooks rail siding extension (\$2.6 million).

ODOT anticipates that there will not be funding available in the 2017-2019 biennium due to the funding commitments listed above. After the projects have been funded, and if funding is available, ODOT will announce next steps for the program. If the state legislature makes further authorizations, many of Tillamook's transportation projects may be eligible based on funding criteria. More information on this program can be found at <http://www.oregon.gov/ODOT/TD/TP/pages/connector.aspx>.

Oregon Immediate Opportunity Fund

The Oregon Immediate Opportunity Fund supports economic development in Oregon through construction and improvements of streets and roads. Funds are discretionary and may only be used when other sources of financial support are unavailable or insufficient. The objectives of the Opportunity Fund are providing street or road improvements to influence the location, relocation, or retention of a firm in Oregon; providing procedures and funds for the OTC to respond quickly to economic development opportunities; and providing criteria and procedures for the Oregon Economic and Community Development Department (OECDD), other agencies, local government and the private sector to work with ODOT in providing road improvements needed to ensure specific job development opportunities for Oregon, or to revitalize business or industrial centers. More information can be found at <http://www.oregon.gov/ODOT/TD/TP/Plans/IOF.pdf>.

Oregon Transportation Infrastructure Bank (OTIB)

OTIB is a statewide revolving loan fund available for highway projects on major collectors or higher classifications and bicycle or pedestrian access projects on highway right-of-way. Applications are accepted at any time. More information can be found at <http://www.oregon.gov/ODOT/cs/fs/Pages/otib.aspx>.

Special City Allotment Grants (SCA)

Special City Allotment (SCA) Grants are distributed among cities with population of less than 5,000 to help repair or reconstruct City-maintained streets that are inadequate for the capacity they serve or are deemed unsafe. The City has received two SCA grants in the last several years. Tillamook's population was at just under 5,000 people according to the 2015 Census so it is unlikely that the City will continue to be eligible for this funding program. More information can be found at <http://www.oregon.gov/ODOT/HWY/REGION2/docs/resources/SpecialCityAllotmentGrantProgram.pdf>.

Statewide Transportation Improvement Fund (STIF)

HB 2017 established a new dedicated source of funding, Statewide Transportation Improvement Fund (STIF), for expanding public transportation service in Oregon. STIF is funded through revenue generated from a new payroll tax of one-tenth of one percent on wages paid to employees in Oregon. There are four components:

- Formula Fund: 90 percent to mass transit districts, transportation districts, or counties without either a mass transit or transportation district, and to federally-recognized tribes based on formula allocation.
- Discretionary Fund: five percent to public transportation service providers based on a competitive grant process.
- Intercommunity Discretionary Fund: four percent to public transportation service providers to improve public transportation between two or more communities based on a competitive grant process.
- Technical Resource Center: one percent to ODOT to establish a statewide public transportation technical resource center to assist public transportation providers in rural areas and for ODOT to administer STIF.

The City should coordinate with NW Connector to pursue STIF funding for transit improvements identified in the TSP. Under the current schedule, the first Formula Fund disbursements are planned to occur as early as April 2019. The first Discretionary and Intercommunity competitive grant agreements are anticipated to be effective by July 2019. More information on STIF can be found at <http://www.oregon.gov/ODOT/RPTD/Pages/STIF.aspx>.

Local Funding and Finance Sources

Most of the sources below would provide additional transportation revenue to the City that could be spent on a wide variety of projects.

Local Fuel Tax

The Tillamook City Council passed a 1.5 cent per gallon fuel dealers license tax in 1982. There have been subsequent efforts to increase the fuel tax, but they were met with public resistance and ultimately failed. On average the City collected \$125,000 annually over a five-year period from 2012 to 2017 from the local fuel tax. This revenue could be used to fund TSP projects and improvements. An increase to the local fuel tax could increase revenue for TSP project. For comparison, most cities in Oregon that levy local fuel taxes have local rates of between \$0.01 and \$0.04 per gallon.

Transportation Maintenance/Utility Fee

A transportation maintenance fee (or utility fee) is a fee based on use of the transportation system that is collected from residences and businesses. The City currently does not levy a transportation maintenance or utility fee; however, many Oregon jurisdictions levy such a fee to pay for maintenance and operations of city streets. These fees are typically assessed monthly to residents, businesses and other non-residential uses. Non-residential fees are typically assessed by type of use, square footage of the building, and/or number of parking stalls that would be required under city code for a given use.

Fees vary significantly from city to city; the City of Hillsboro currently charges each single-family home \$3.10 per month, Stayton charges \$1.00 - \$2.00 per month per home and Oregon City charges \$4.50 per single-family residence. Non-residential fees also vary, with fees ranging from less than \$0.15 to as much as \$20.00 per square foot, depending on the type and intensity of use. The City of Tigard charges \$1.12

per month per parking stall required for non-residential uses. The City could consider charging such a fee to fund a greater share of maintenance costs, thereby freeing resources for capital projects.

Tax Increment Financing (Urban Renewal Areas)

The Tillamook Urban Renewal Agency (TURA) reported a total of \$294,182 in tax revenue for fiscal years 2016-2017. The funds were allocated to various projects including façade improvements, new sidewalks, renovations to the Chamber of Commerce, and several underground electrical projects. TURA funds could be used to fund sidewalk improvement projects identified in the TSP. However, TURA funds must be expended within the TURA district boundary, are subject to an application process, and funding/financing opportunities are limited. Nonetheless, TURA funds represent a project-specific source of funds for projects within the district.

System Development Charges (SDCs)

System Development Charges (SDCs) are fees imposed on new development and can be an important means for cities to pay for increased capacity within infrastructure to accommodate new users. SDC revenue can be used for a wide variety of services including, water, sewer, stormwater, parks and recreation, and transportation improvements. SDC revenue is highly dependent on the type and amount of development occurring within a jurisdiction and the fees must be regularly adjusted based on the infrastructure needs of the City. The City of Tillamook currently charges SDCs for other utilities, but not transportation.

A 2013 League of Oregon Cities SDC Survey documented 109 Oregon municipalities have implemented SDCs, including Seaside, Cannon Beach, Bay City, and Warrenton. In the 2016-17 fiscal year, Warrenton received \$65,690 in direct revenue from transportation specific SDCs, while Stayton received \$43,906.

Table 4 summarizes information on transportation-specific SDCs implemented by a relevant sample of Oregon cities. Note that an improvement charge is a fee associated with capital improvements to be constructed, while reimbursement fee is a charge for unused capacity in capital improvements already constructed or under construction. Some jurisdictions combine these designations for one overall fee assessment.

TABLE 4. TRANSPORTATION-SPECIFIC SDC CHARGES BY PEER JURISDICTION³

Jurisdiction	Residential Charge	Non-Residential Charge ⁴	Basis of Assessment
Bandon	\$1,140 Improvement \$606 Reimbursement	\$34,306 Improvement \$18,302 Reimbursement	Fee calculated by square footage related to trip generation
Depoe Bay	\$2,699	\$49,640	Fee includes improvement and reimbursement. Trip cost X trip rate (ITE, or modified), residential per unit, nonresidential on square footage, or per room (tourist accommodation), per student (school)
Florence	\$865	\$16,301	Residential 9.55 trips per dwelling. Office 9 trips per 1,000 sq. ft. of building area

³ Source: System Development Charges Survey, August 2016, League of Oregon Cities. Available from <https://orcities.org/Portals/17/Library/2016%20SDC%20Survey%20Report.pdf>

⁴ Total amount received for non-residential sources for that jurisdiction at the time of survey.

Jurisdiction	Residential Charge	Non-Residential Charge ⁴	Basis of Assessment
Newport	\$2,040	Varies	Calculated per square foot for single family development and by Average Daily Vehicle Trip for all other users
Stayton	\$2,512	\$68,869	Fee assessment P.M. peak hour trip generation based on ITE Code
Phoenix	\$1,510 Improvement \$528 Reimbursement \$62 Other Fee	\$44,540 Improvement \$15,592 Reimbursement \$1,821 Other Fee	Fee is based on land use type, building size/square footage and peak hour trips.
Warrenton	\$1,238 Improvement	Varies	Fee assessment based on dwelling unit for residential properties and by square footage

There is an opportunity for Tillamook to levy SDCs and generate additional revenue for transportation investments identified in the TSP in addition to other infrastructure improvements.

Parking Fees

The City of Tillamook does not currently charge for parking. Income generated by charging parking fees could be used to implement a variety of transportation projects. The collection system would require purchase of parking meter infrastructure, careful study of where to install meters, and analysis of the appropriate fee amount to charge drivers. However, relatively low demand and abundant free parking on nearby neighborhood streets may mean that charging for parking is infeasible.

Bonds

Revenue or general obligation bonds can help finance construction of capital improvement projects by borrowing money and paying it back over time in smaller installments. Bonds are typically backed by new revenue, like an additional property tax levy.

Local Improvement Districts

Local Improvement Districts (LID) can be created by property owners within a district to raise revenues for infrastructure improvements within district boundaries. Typically, property owners work together to form an LID. An LID could potentially fund specific improvements in certain neighborhoods; they are often formed to make sidewalk improvements. LIDs can be difficult to establish and rely on the cooperation of property owners.

Funding Recommendation

This section discusses a draft recommended plan for increasing funding to accomplish TSP projects and programs. In the opinion of the authors, this funding plan represents a feasible and responsible path forward for generating additional revenue; this funding recommendation is subject to review and revision by the City and the Project Advisory Committee (PAC). Note that no financing, in the form of bonds or other loans, is proposed.

The City has relied on a combination of local revenue and state and federal grants to complete transportation projects in the past. The City should continue to rely on a mix of funding sources, with enhanced local revenue to support new projects and serve as matching funds for state and federal grants. The following reviews recommended local revenue enhancements.

Raise the local gas tax

The City currently levies a local fuel tax of \$0.015 per gallon of gasoline. This tax currently results in approximately \$120,000 per year in revenue. Increasing the local fuel tax to \$0.03 per gallon would

approximately double fuel tax revenue to \$240,000 per year. The City should consider the following with respect to increasing the local fuel tax:

- Tillamook's current local tax is less than that of other cities in Oregon, which typically levy local fuel taxes from between \$0.02 to \$0.04 per gallon.
- A \$0.015 increase in the fuel tax is unlikely to significantly increase transportation costs for residents of Tillamook; the increase would cost the average driver approximately an additional \$0.15 per fill-up or \$7.20 per year.⁵
- Local gas tax would also be paid by visitors and those travelling through Tillamook, whereas other forms of local revenue (like transportation maintenance fees) are typically sourced exclusively from residents and employers.
- Average fuel economy is increasing and the number of alternative fuel vehicles is growing, meaning that the gas tax generally will become a less effective revenue instrument in the future. Revenues would likely decline over the planning period. This revenue decline could be mitigated by future increases in the local gas tax rate.
- Prior efforts to raise the local gas tax in Tillamook have not been successful. The City would need to adopt a strategy for public acceptance of an increased local gas tax. Tactics that have been successful in other communities include clearly defining the projects that increased revenue would support; articulating how the increase would affect the cost of transportation; and showing the potential transportation benefits to the community.

Implement System Development Charges

System Development Charges (SDCs) are fees levied on developers during the permitting and approval process for constructing new development. Tillamook does not currently assess transportation SDCs. As noted above, several coastal communities do charge SDCs. Some considerations include:

- SDCs are commonly employed by jurisdictions. They primarily impact developers. However, depending on the magnitude of the fee, SDCs may increase the costs of developing, though SDCs typically represent a very small fraction of the costs of development and would likely have a negligible effect on construction costs.
- SDC revenue is not reliable from year to year and is completely dependent on the amount and type of development occurring. During economic downturns, SDC revenue may decline substantially.
- It is difficult to estimate SDC revenue, as revenue is dependent on the type of fee assessment; development of a SDC methodology and fee structure is beyond the scope of this TSP Update. However, at a hypothetical fee of \$2,000 per new residential unit, Tillamook could expect to generate about \$754,000 over the life of the plan in residential SDC revenue, based on a forecasted 377 additional households by 2040. For non-residential, assuming approximately 75,000 square feet of new non-residential development⁶ and a low average fee of \$2,000 per 1,000 square feet, the City could generate approximately \$140,000 additional in non-residential fees.

⁵ Based on a ten gallon fill-up and an average of 12,000 miles driven per year and 25 miles per gallon average fuel economy of the current fleet.

⁶ Based on a conservative assumption of approximately 100 square feet per new anticipated employee. Approximately 700 new employees/jobs are forecast in Tillamook by the planning horizon year.

Partnerships

While not a funding mechanism per se, partnerships represent an opportunity to leverage local City transportation dollars with partners to realize projects of mutual benefit. Some potential partnerships that should be pursued by the City include:

- Tillamook School District: the City should pursue partnerships with the school district as both a partner in Safe Routes to School grant funding requests, as well as a potential funding partner on projects. Specifically, the City and school district could partner to develop a Safe Routes to School Action Plan to initiate project development increase the changes of receiving SRTS funding.
- Tillamook Area Chamber of Commerce: the Chamber could help advocate for certain projects of particular benefit to businesses in Tillamook. Chambers of commerce in other communities have also contributed toward transit serving downtown business districts and assisted in parking management and parking improvement projects. Projects like the Salmonberry Trail through Tillamook may present opportunities for partnership.
- Tillamook County Transportation District (TCTD): The City and TCTD could partner on transit stop improvement projects in the City, leveraging each other's resources to accomplish civil improvements (e.g., new sidewalks) with transit amenities (e.g., shelters).

Leverage Utility Projects

The City is interested in developing a coordinated Capital Improvement Program (CIP) moving forward to make the best use of its street and utility funds. There are opportunities to coordinate utility maintenance and replacement projects with street projects, including overlays and sidewalk construction. Combining projects – for example, sewer main replacement with a desired overlay and sidewalk project – saves on construction costs and can be a win-win for the City.

Summary

TABLE 5. REVENUE FORECAST WITH ADDITIONAL SOURCES OF LOCAL REVENUE

Source	2017	2040	Total over 25-year life of plan	Notes
State gas and existing local gas tax revenue available for capital projects	\$41,500	\$41,500	\$1,037,500	The City typically expends on average 11% of its transportation revenue on capital projects. This estimate assumes that the City will continue to have approximately this amount available for capital projects.
SCA Grants	\$100,000	\$0	\$100,000	These funds are available for capital projects. However, Tillamook will likely exceed the population threshold for this grant program and no longer be eligible for funding. This assumes that Tillamook's population will exceed 5,000 by the 2020 Census. Assuming that applicants would reasonably be granted an award every 4 years, this source of funding would no longer be available after 2018.
Proposed: Additional \$0.015 per gallon local fuel tax revenue	N/A	\$120,000	\$3,000,000	This assumes that 100% of the additional fuel tax revenue would be available for capital projects; this figure would be reduced if these additional revenues would be needed for system maintenance and

Source	2017	2040	Total over 25-year life of plan	Notes
				preservation. Assumes that the fee is enacted at the beginning of the planning period.
Proposed: System Development Charges (SDCs)	N/A	\$35,700	\$894,000	SDC revenue is high variable and dependent entirely on the type and volume of development occurring in the City as well as the fee structure and methodology for calculating the fee. Revenues vary substantially from year to year.
TOTAL ESTIMATED FUNDS FOR CAPITAL PROJECTS with LOCAL FUNDING ENHANCEMENTS:			\$5,031,500	

The local funding mechanisms proposed above and summarized in Table 5 would generate an approximately \$3,900,000 million additional over the life of the TSP.

The total cost of recommended TSP projects is \$10,626,000.⁷ Of this amount, \$1,767,000 of projects are assumed to eligible for federal or state grant funding programs.⁸ Additionally, most of the bicycle and pedestrian improvement projects, or \$5,383,000, are likely eligible for Safe Routes to School program funds.⁹ Approximately \$3,475,000 of recommended projects are not likely eligible for federal or state grant funding and would require local funding to complete. Table 6 summarizes the City's approximate local contribution needed to fund local projects; the exact funding sources and match requirements are subject to individual project funding and financing decisions during implementation of the TSP.

TABLE 6. FUNDING SUMMARY

Project cost	Primary Funding Source	Minimum Local Match Required ¹⁰	Local Funds Required
\$1,767,000	State and Federal Grant Programs (STIP or others)	~11% (can vary from year to year)	\$194,000
\$5,383,000	Safe Routes to School	40% ¹¹	\$2,153,000

⁷ Some project costs in Technical Memorandum #8 Solutions Evaluation are presented as a range; this total cost uses the mid-range where a range of costs was given.

⁸ This includes projects on the state highways (US 101 and OR 6) and off-street path projects that are likely to become part of the future Salmonberry Trail project. Other projects on federally functionally classified roadways (e.g., 3rd Street) would potentially be eligible for state or federal funding programs, but it is less likely that they would be funded.

⁹ Final rulemaking on Safe Routes to School funding is underway at the state level as of this writing. The current proposed local match, subject to change, is 40%.

¹⁰ It is important to note that in many cases projects are more competitive for grant funding when greater local match is provided in excess of the minimum match amount.

¹¹ Draft SRTS rules for House Bill 2017 require a 40% local match. Previous match requirement was 12% when the SRTS program was primarily federally-funded.

Project cost	Primary Funding Source	Minimum Local Match Required ¹⁰	Local Funds Required
\$3,475,000	Local	N/A	\$3,475,000
TOTAL LOCAL FUNDS LIKELY REQUIRED:			\$5,822,000

With the additional local funding described in this section, the City would likely have nearly sufficient funds to provide match for state and federal grants, as well as funds available for those projects that are unlikely to be funded by other sources.

Conclusion

Although the City does not currently have adequate funding to support all potential TSP projects, there are several promising sources of local funding that could be pursued to implement transportation improvements. State and federal funds continue to be an important source of funding for future projects including STIP and SRTS funds. Many of these funding programs have recently received infusions from House Bill 2017 and should be monitored to identify eligible projects as rulemaking continues in 2018 and 2019.



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Appendix J

Transportation Standards



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Transportation Standards - Technical Memorandum #10

July 18, 2017

Prepared for:

Paul Wyntergreen, City of Tillamook
Ken Shonkwiler, ODOT

Copy to:

Kristin Hull, CH2M
Ryan Farncomb, CH2M

Prepared by:

Garth Appanaitis, DKS
Kelly White, DKS

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Introduction

The purpose of this memorandum is to provide an overview of transportation standards and guidelines in Tillamook. Some of these elements will be incorporated into the Transportation System Plan as policy elements (such as functional classification and local connectivity guidance) while other elements are provided here for reference purposes but are enacted through other documents (such as the Public Works Design Standards). Those documents (as noted in Table 1) should be referenced for the latest standards following adoption of the TSP.

Content Overview

Table 1 provides an overview of the content included in this memorandum, including which items will be included in the TSP, and which items may include new guidance. New guidance in the TSP (or other documents) may be revised pending review with the project team and others. Each item is included in the following sections.

TABLE 1. TRANSPORTATION STANDARDS AND REFERENCE DOCUMENTS

Element	Most Current Location	Intended Location	TSP Update Needs
Roadway and Access Spacing	PWDS and/or 153.051	PWDS	Reference Location
Mobility Targets	Zoning Code	TSP	Include policy in TSP
Functional Classification	TSP	TSP	Update map to include planned roadways and any recommended changes
Local Street Connectivity	None	TSP	Describe optimal connectivity and map future connections
Roadway and Shared Use Path Cross-Sections	PWDS	PWDS	Reference Location
Local Evacuation Routes (Life Line Routes)	TSP	TSP	Review and Add Map
Enhanced Pedestrian Crossing Treatment Guidelines	None	TSP	Provide New Guidance
ITS Coordination Guidelines	None	TSP	Provide New Guidance
Traffic Impact Analysis (TIA) Guidelines	Zoning Code 153.073 9.A	Title XV: Land Usage	Reference Location
Neighborhood Traffic Management Tools (including stop sign prioritization strategy)	TSP	TSP	Provide New Guidance
Freight Routes	TSP	TSP	Review and Update Map

Roadway and Access Spacing

The number and spacing of access points, such as driveways and street intersections, along a roadway affects its function and capacity. Access management is the control of these access points to achieve the desired balance between through mobility and local accessibility consistent with the functional classification of the street.

Access management is especially important on arterial and collector facilities to reduce motor vehicle congestion and crash rates for safe and efficient travel. Since each access point represents an additional location for potential conflicts, reducing or consolidating driveways on these facilities can decrease collisions and preserve capacity on high-volume roads, maintaining traffic flow and mobility within the city.

Balancing access and good mobility can be achieved through various access management strategies, including establishing access management spacing standards for driveways and intersections.

Tillamook Access Spacing Standards

The City's guidelines for access spacing are in the zoning ordinance, section 22.1.17, part E. For reference, the City's standard access spacing requirements are listed in Table 2 and Table 3.

TABLE 2. MINIMUM SPACING REQUIREMENTS FOR ROADWAYS IN THE CITY OF TILLAMOOK

Functional Class	Minimum Spacing	Notes
US 101, OR-6, and OR-131	See next section	Standard from the Oregon Highway Plan (OHP).
Arterial	100 feet	Also applies to controlled intersections (i.e. with four-way stop sign or traffic signal) on arterials.
Collector	50 feet	Also applies to controlled intersections (i.e. with four-way stop sign or traffic signal) on collectors.
Local	10 feet	As measured from the sides of the driveway/street.

TABLE 3. PERMITTED NUMBER OF ACCESS POINTS FOR HOUSING TYPES IN THE CITY OF TILLAMOOK

Housing Type	Number of Access Points Permitted ¹	Notes
Single-family (detached and attached), two-family, and three-family	1	When alley access cannot otherwise be provided
	2	For two-family and three-family housing on corner lots (no more than one per street)
Multiple family, commercial, industrial, and public/institutional developments	Minimal to protect the function, safety, and operation of streets and sidewalks	Shared access may be required in order to maintain the required access spacing and minimize the number of access points
¹ The number of access points are also subject to the access spacing standards found in Table 2.		

Access Spacing Standards for State Highways

A review of the findings for the major corridors in the study area are summarized in the following tables. Table 4 lists the ODOT spacing standards for each facility, as defined by the Oregon Highway Plan (OHP).

TABLE 4. ACCESS SPACING STANDARDS FOR STATE HIGHWAYS¹

Facility	Designation	Access Spacing (feet) for the Posted Speed (mph)				
		≤25	30-35	40-45	50	≥55
US-101	Rural Statewide Highway	550	770	990	1100	1320
OR-6	Rural Regional Highway	450	600	750	830	990
OR-131	Rural District Highway	400	400	500	550	700
All	Downtown Areas ^A	city block	270	mid-block	135	

^A Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 150 feet (46 meters) or mid-block if the current city block is less than 300 feet (91 meters).

Overall, the highways in Tillamook are not currently meeting their respective access spacing standards. This is often due to business development along most of the corridors. OR-6 to the east of Del Monte Avenue is relatively undeveloped and meets the spacing standard. In the downtown area, there are often multiple private driveways in between blocks. This can lead to an unnecessary amount of vehicular and pedestrian conflicts. The City has attempted to mitigate this situation by giving up accesses on FEMA purchased properties that have more than one driveway, as well as consolidating highway access points to adjoining parcels.

Recommended Spacing Standards for City Streets

The City may consider future increases to access spacing for collectors and arterials (3rd Street) to retain mobility along these corridors. Increasing collector access to 100 feet and arterial access to 200 feet (or more) would reduce the opportunity for saturated driveways that introduce turning conflicts and degrade mobility.

Mobility Targets

Mobility standards, or targets, are the thresholds set by an agency for the maximum amount of motor vehicle congestion that is acceptable for a given roadway. Adopted mobility standards can be used to prioritize investment decisions and help the City ensure that transportation facilities are improved in a timely manner to support new growth. If these standards are set too low, the City may experience more motor vehicle congestion than has been determined to be acceptable for the quality of service desired. However, if they are set too high, the cost of meeting them would likely include construction of more paved surfaces, which may result in excessive impacts to property and the environment or discourage future development.

Tillamook Mobility Standards

Tillamook's currently adopted mobility standard requires that traffic operations for both signalized and unsignalized intersections meet a minimum performance target of Level of Service (LOS) D as found in

¹ Oregon Department of Transportation. 1999 Oregon Highway Plan, Appendix C, Tables 14-16, 1999.

their requirements for a Traffic Impact Analysis. LOS is a “report card” rating (A through F) based on the average delay experienced by motorists. LOS A, B, and C indicate conditions where traffic moves without significant delay over periods of peak hour travel demand. LOS D, E, and F are progressively worse. LOS D, the current mobility standard, equates to a maximum allowed average delay per vehicle of 55 seconds at signalized intersections and 35 seconds at stop-controlled intersections. It is recommended that this local mobility target is referenced in the TSP.

Functional Classification

Street functional classification is an important tool for managing the roadway network. The street functional classification system recognizes that individual streets do not act independently of one another but instead from a network that works together to serve travel needs on a local and regional level. By designating the management and design requirements for each roadway classification, the hierarchical system supports a network of streets that perform as desired.

Functional Classification System in Tillamook

The descriptions of each functional classification are listed in the following sections. Figure 1 shows the current functional classification in Tillamook.

Principal and Minor Arterials

Principal arterials provide a high degree of mobility between major centers of metropolitan areas, as well as rural areas. They often serve high volumes of traffic (>10,000 daily vehicles) over long distances, typically maintain higher posted speeds (45 mph to 55 mph), and minimize direct access to adjacent land to support the safe and efficient movement of people and goods. Inside urban growth boundaries, speeds may be reduced to reflect the roadside environment and surrounding land uses. US-101 and OR-6 are the only principal arterials in the city.

Minor arterials provide service for trips of moderate length and serve geographic areas that are smaller than their higher-volume principal arterial counterparts. Because they primarily serve longer trips within the city, they should, where feasible, be provided in continuous lengths of multiple miles rather than in short segments. In an urban context, they are often used as a transition between principal arterials and collectors. Minor arterials typically serve higher volumes of traffic (>5,000 daily vehicles) at moderate to high speeds, with posted speeds generally no lower than 30 mph, unless they are passing through a downtown area. 3rd Street east of Nestucca Avenue is the only minor arterial in the city.

Principal and minor arterial streets are often the fastest and most direct routes for all modes of travel, including people walking and biking. However, facilities for people walking and biking should be designed to provide a greater degree of separation from the higher volumes and speeds of auto traffic. Wider and more heavily traveled principal and minor arterial streets can also present barriers for people walking and biking where they need to cross the street to reach a destination. Therefore, the need for enhanced crossing opportunities may be greater.

Suggested spacing of minor arterial streets varies from 2 to 3 miles in suburban fringes to not more than 1 mile in fully developed areas. Access to adjacent land is provided but is a low priority.

ODOT has also identified the functional classification of the state facilities in Tillamook. US-101 is the only designated rural principal arterial and OR-6 is the only designated rural minor arterial. Netarts Highway (OR-131) is designated as an urban collector. In addition, US-101 is classified by ODOT as a scenic byway in the adopted 1999 Oregon Highway Plan (OHP). The OHP also provides for special designation of certain highway segments to guide future planning and management decisions, and to

balance the needs of through traffic with local traffic and development. This includes the special transportation area (STA) designation, which applies to the segment of US-101 from 1st Street to the southern UGB limits. STAs have specific objectives for access management, automobiles, pedestrian and bicycle accommodation, transit amenities and development. This may result in lower speeds, narrower lane widths and wider sidewalks on the state highways.

Major and Minor Collectors

Collectors serve a critical role in the roadway network by connecting traffic from local streets with the arterial network. Major collector routes are generally distinguished from minor collector routes by longer length; lower connecting driveway densities; higher speed limits; greater spacing intervals; higher traffic volumes; and may have more travel lanes. The general traffic volume on a major collector ranges from 1,200 to 5,000 daily vehicles and speeds are often managed between 25 mph and 35 mph. The typical traffic volume on a minor collector ranges from 1,200 to 3,000 daily vehicles and speeds are managed to no more than 25 mph.

Due to the lower auto traffic volumes and speeds compared to arterials, traveling on major and minor collectors is generally more comfortable for people walking and biking. However, separate biking facilities are still needed.

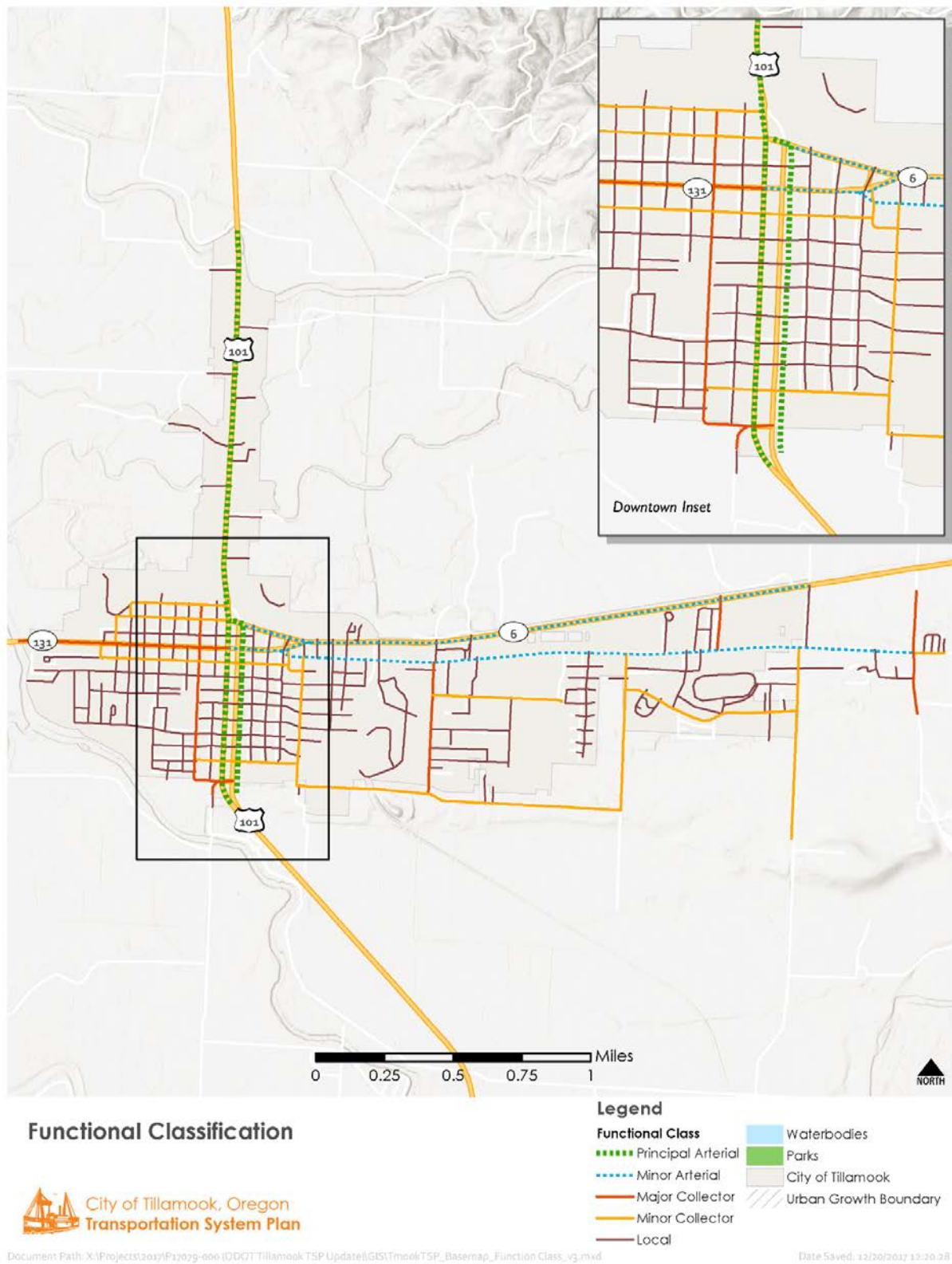
The maximum interval for spacing collector streets should be approximately one half-mile. While access and mobility are more balanced than on arterials, new driveways serving residential units should not be permitted on collectors where traffic volume forecasts for the street exceed 5,000 vehicles per day.

Local Streets

Local streets prioritize provision of immediate access to adjacent land. These streets should be designed to enhance the livability of neighborhoods and should generally accommodate less than 2,000 vehicles per day. When traffic volumes reach 1,000 to 1,200 vehicles per day through residential areas, safety and livability can be degraded. A well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles, limits out-of-direction travel, and encourage walking and biking. Speeds are not normally posted, with a statutory 25 mph speed limit in effect. Local streets are not intended to support long distance travel and are often designed to discourage through traffic.

Local streets typically provide low-stress travel routes for people walking and biking. Due to lower vehicle volumes and speeds, dedicated bicycle facilities are not required on local streets and cyclists can share the lane with vehicles. Dedicated pedestrian facilities are required, however even curb-adjacent sidewalks on local streets can still provide a high level of comfort.

FIGURE 1. STREET FUNCTIONAL CLASSIFICATION



Recommended Functional Classification System

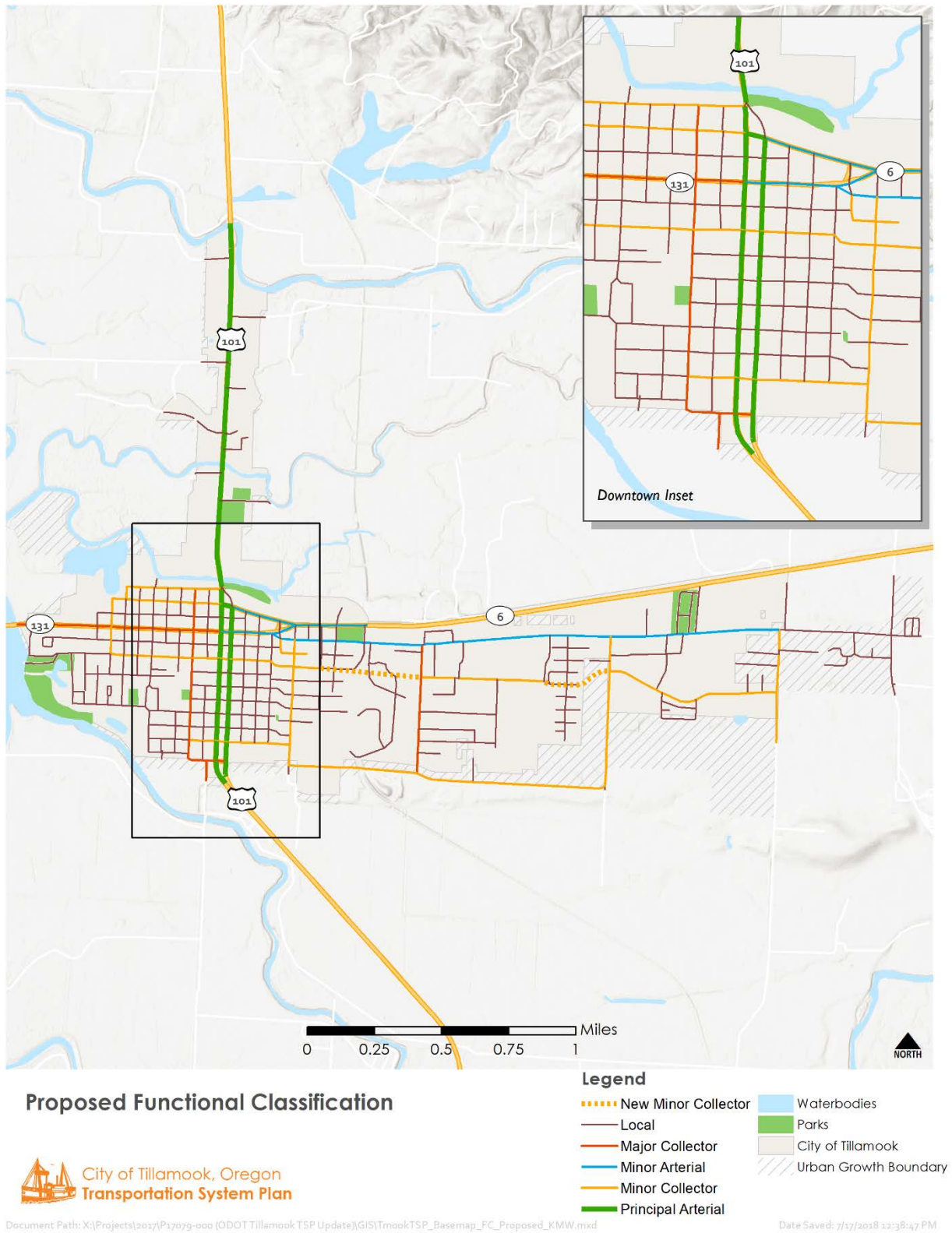
The recommended functional classification system for roadways in the City of Tillamook is shown in Figure 2, which includes new street extensions proposed as part of the motor vehicle system improvements.

Classifications shown for County roads inside the Tillamook UGB reflect the City's desired function for those facilities. These classifications may not match those shown in Tillamook County's TSP. However, Tillamook County policy is to apply City standards to County facilities within UGBs. Therefore, it is anticipated that Tillamook standards will be applied to County roads.

Key recommended changes to the functional classification are as follows:

- The future extension of 5th Street to Alder Lane and Dogwood Lane to Brookfield Avenue as a future Minor Collector for improved east-west connection.
- Reclassify 4th Street from a Minor Collector to a Local Street, and 5th Street and Birch Avenue as Minor Collectors. This provide a future complete east-west connection throughout the city. In addition, it will also provide better spacing and separation from the designated Major Collector on 3rd Street.

FIGURE 2. PROPOSED STREET FUNCTIONAL CLASSIFICATION



Local Street Connectivity

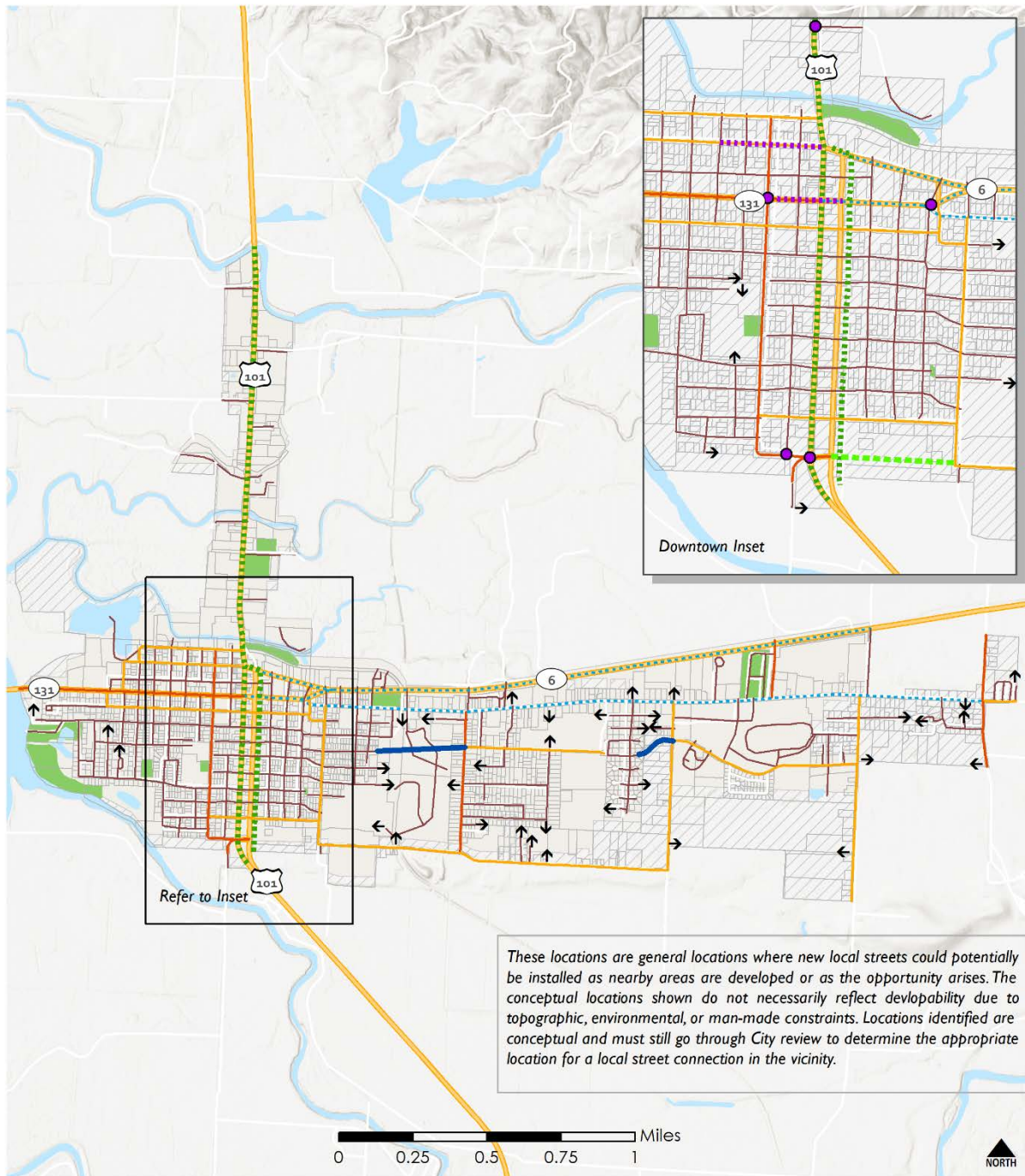
Local street connectivity is required by the state Transportation Planning Rule (OAR 660-012) and is important for Tillamook's continued development. Providing adequate connectivity can reduce the need for wider roads, traffic signals, and turn lanes. Increased connectivity can reduce a city's overall vehicle miles traveled (VMT), balance the traffic load on major facilities, encourage residents to seek out other travel modes, and reduce emergency vehicle response times. While improvement to local street connectivity is easier to implement in developing areas, retrofitting existing areas to provide greater connectivity should also be attempted.

Tillamook's existing street connectivity is constrained by highways, natural features such as streams and wetlands, and by undeveloped areas of future development. The proposed Local Street Connectivity Plan shown in Figure 3 identifies approximate locations where new local street connections should be installed as areas continue to develop. The location identified in Figure 3 are not an exhaustive list of all future local street connections. Rather, the purpose of the maps is to ensure that new developments accommodate circulation between adjacent neighborhoods to improve connectivity for all modes of transportation. Additional connections to improve the street network grid are not shown.

These locations included in Figure 3 are general locations where new local streets could potentially be installed as nearby areas are developed or as the opportunity arises. The conceptual locations shown do not necessarily reflect developability due to topographic, environmental, or manmade constraints. Locations identified are conceptual and must still go through City review to determine the appropriate location for a local street connection in the vicinity.

The design and construction of new connecting streets should evaluate whether neighborhood traffic management strategies are necessary to protect existing neighborhoods from potential traffic impacts caused by extending stub end streets. In addition, in order to establish appropriate expectations, the City should require the installation of signs indicating the potential for future connectivity when development constructs stub streets.

FIGURE 3. LOCAL STREET CONNECTIVITY PLAN



Local Street Connectivity Plan



City of Tillamook, Oregon
Transportation System Plan

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Roadway and Shared Use Path Cross-Sections

Roadway cross-section standards identify the design characteristics needed to meet the function and demand for each facility type for the City of Tillamook streets. Since the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, this system allows standardization of key characteristics to provide consistency, while providing application criteria that allows some flexibility in the design standards. Under some conditions a variance to the street standards may be approved by the City Engineer. The street cross-section standards are contained in Tillamook's Public Works Design Standards.

Figures 4 through 7 (elements summarized in Table 5), illustrate the standard cross-sections for arterials, collectors, and local roads in the City of Tillamook. These street standards are compliant with the Oregon Transportation Planning Rule (TPR), which specifies that local governments limit excessive roadway widths for local streets and accessways in order to reduce construction costs, provide more efficient use of urban land, discourage inappropriate traffic volumes and speeds, and accommodate convenient pedestrian and bicycle circulation.² These street standards are intended to be used as guidelines in the development of new streets and paths and the upgrading of existing facilities. Planning level right-of-way needs can be determined using these figures. Under some conditions a variance to the street standards may be requested from the City Engineer to consider the alternative minimum cross-section or other adjustments. Typical conditions that may warrant consideration of a variance include:

- Infill sites
- Innovative design (e.g., roundabouts)
- Reallocation of right-of-way between modes (E.g., narrow travel lanes to accommodate wider bike lanes)
- Severe constraints presented by topography, environmental, or other resources present
- Existing developments and/or buildings that make it extremely difficult or impossible to meet the standards

Roadways under ODOT jurisdiction are subject to design standards in ODOT's Highway Design Manual.

² OAR 660-012-0045 (7)

FIGURE 4. 4-LANE ARTERIAL TYPICAL CROSS-SECTION STANDARDS

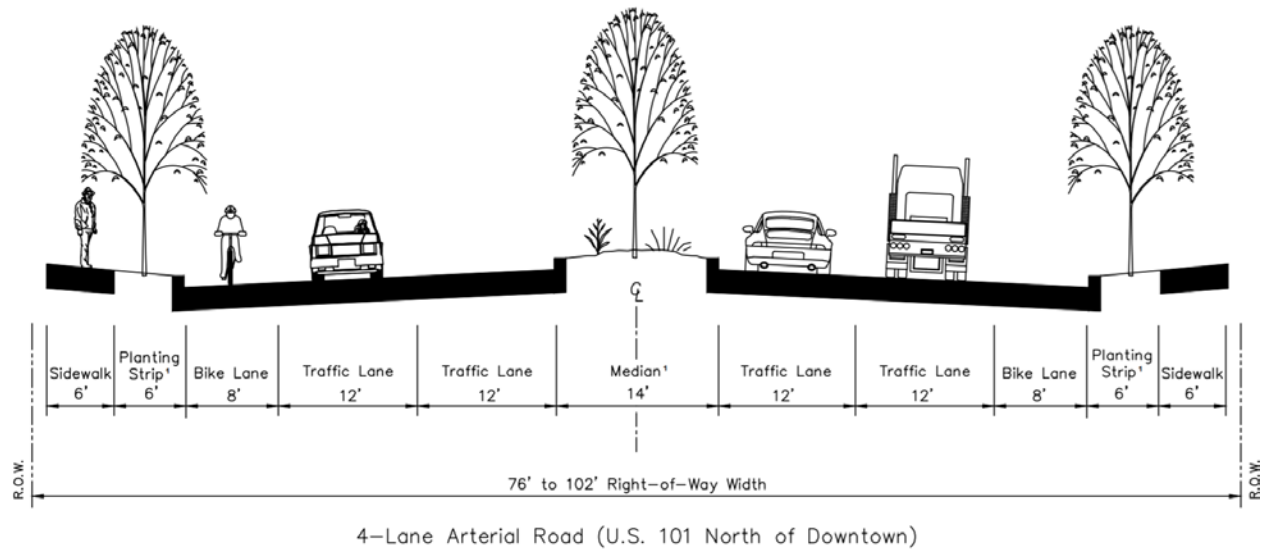
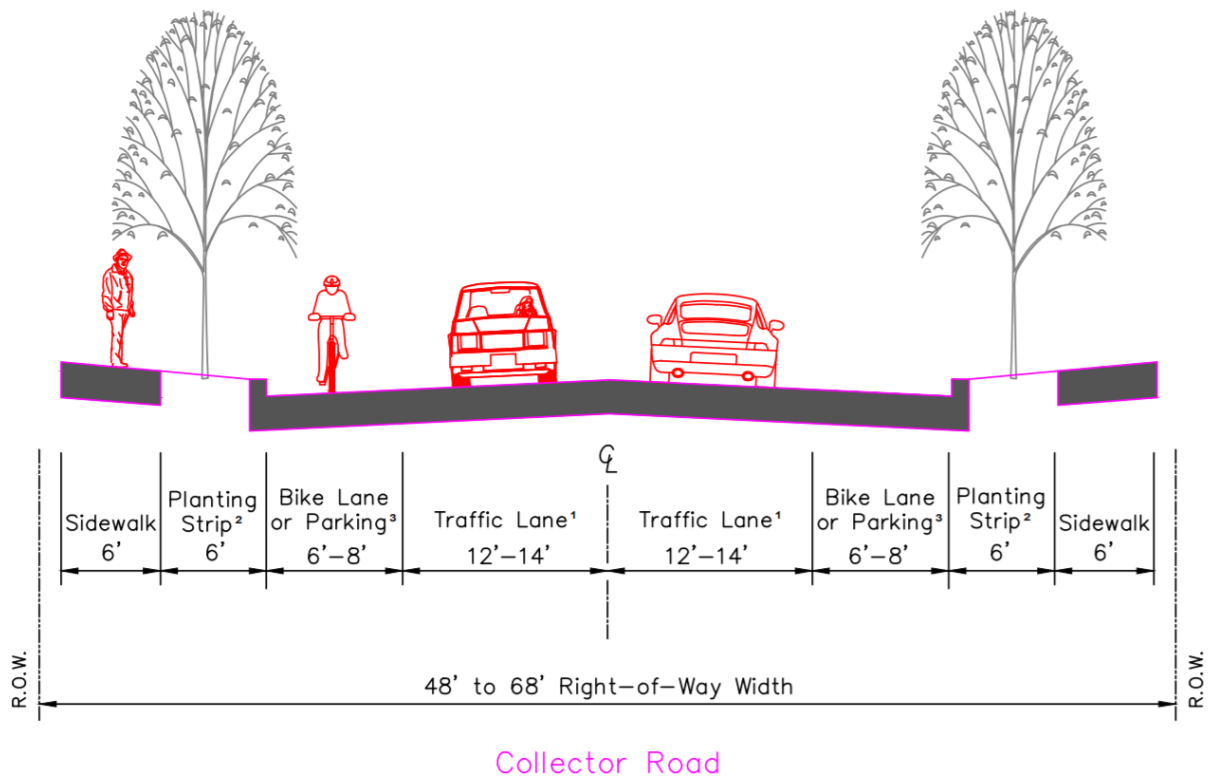


TABLE 5. COMPARISON OF PROPOSED CROSS-SECTION STANDARDS

Width	4-lane Arterial	Collector	Local	Local Alternative
Right-of-Way Width	76 - 102 ft.	48-68 ft.	52-56 ft.	30-48 ft.
Paved Width (curb-to-curb)	64 ft.	36-44 ft.	28 ft.	20 ft.
Travel Lanes	4 lanes (12 ft.)	2 lanes (12-14 ft.)	1 lane (14 ft.)	1 lane (20 ft.)
Turn Lane/Median	14 ft.	No	No	No
Bike Facilities	2 bike lanes (6 ft. with 2 ft. buffer)	2 bike lanes (6-8 ft.)	Shared Lane	Shared Lane
On-Street Parking	No	No	Both sides (7 ft.)	No
Pedestrian Facilities	2 sidewalks (6 ft.)	2 sidewalks (6 ft.)	2 sidewalks (5-6 ft.)	2 sidewalks (5-6 ft.)
Planter Strip (optional)	2 strips (6 ft.)	2 strips (6 ft.)	2 strips (6 ft.)	2 strips (7-8 ft.)

FIGURE 5. COLLECTOR TYPICAL CROSS-SECTION STANDARDS



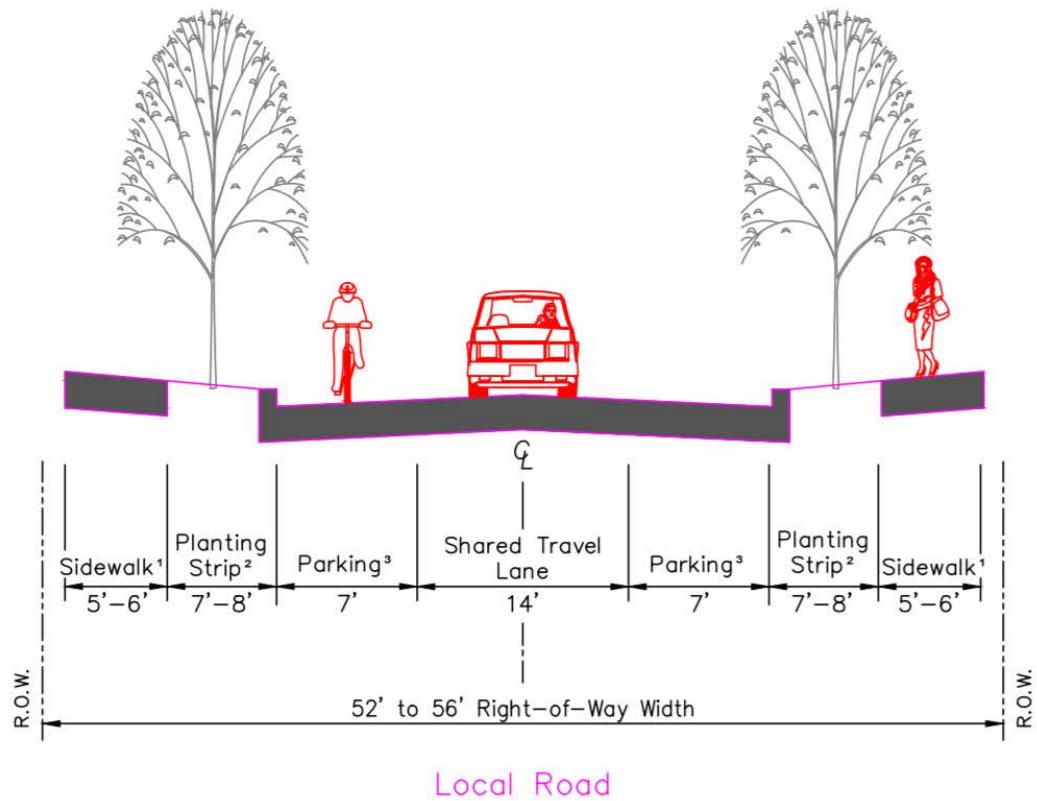
Notes:

¹Where parking is constructed next to a travel lane, the travel lane width shall be increased to 14' to function as a shared roadway and accommodate bikes.

²Optional features

³Width for parking shall be 8' wide. Width for bike lane shall be 6' wide.

FIGURE 6. LOCAL ROAD TYPICAL CROSS-SECTION STANDARDS



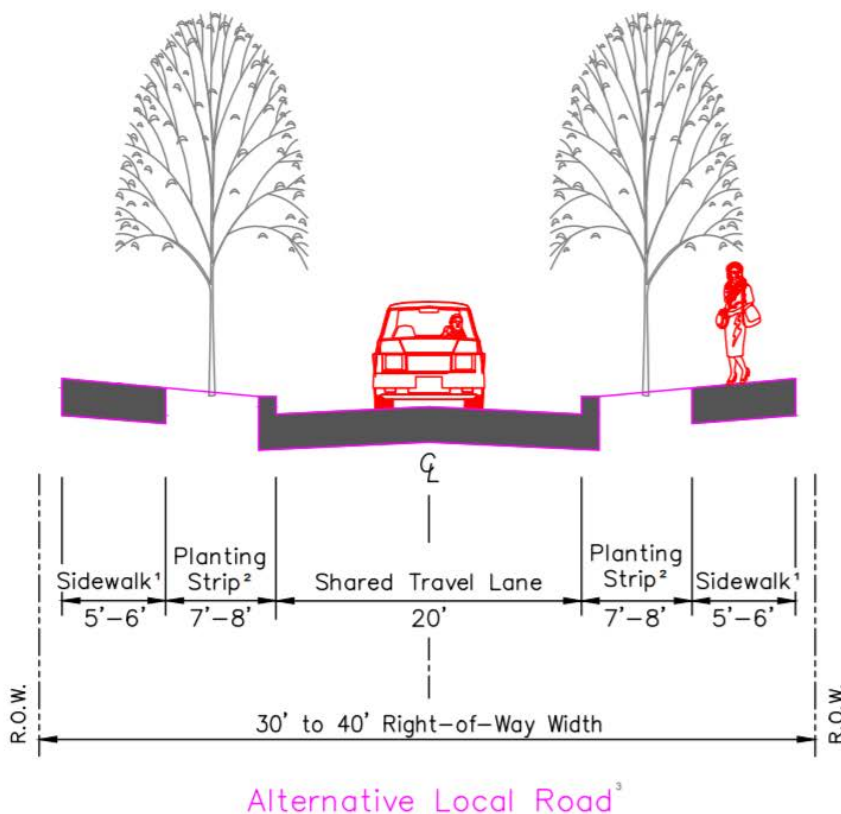
Notes:

¹ If sidewalks are not provided, a separated pedestrian walkway (eg. crushed aggregate separated by curb stops) is required on at least one side of the street.

² Optional features

³ Where appropriate, parking may be provided on one side only, for a paved width of 24' (7' parking + 17' travel lane).

FIGURE 7. ALTERNATIVE LOCAL ROAD CROSS-SECTION STANDARDS



Notes:

¹If sidewalks are not provided, a separated pedestrian walkway (eg. crushed aggregate separated by curb stops) is required on at least one side of the street.

²Optional features

³The alternative local road standard may be used when approved by the City of Tillamook. The standard is intended to apply under one of the following circumstances:

1. The local road will serve 18 or fewer dwelling units upon buildout of adjacent property.
2. The ADT volume of the road is less than 250 vehicles/day.
3. Significant topographical or environmental constraints are present.

The alternative local road standard may be used provided:

- A. Use of the alternative local road standard will not create gaps in connectivity or roadway standards with adjacent roadway sections (i.e. sidewalk, parking, travel lane widths).
- B. The City of Tillamook and Emergency Service Providers have reviewed and accepted usage of the alternative local roadway standard.

Local Evacuation Routes

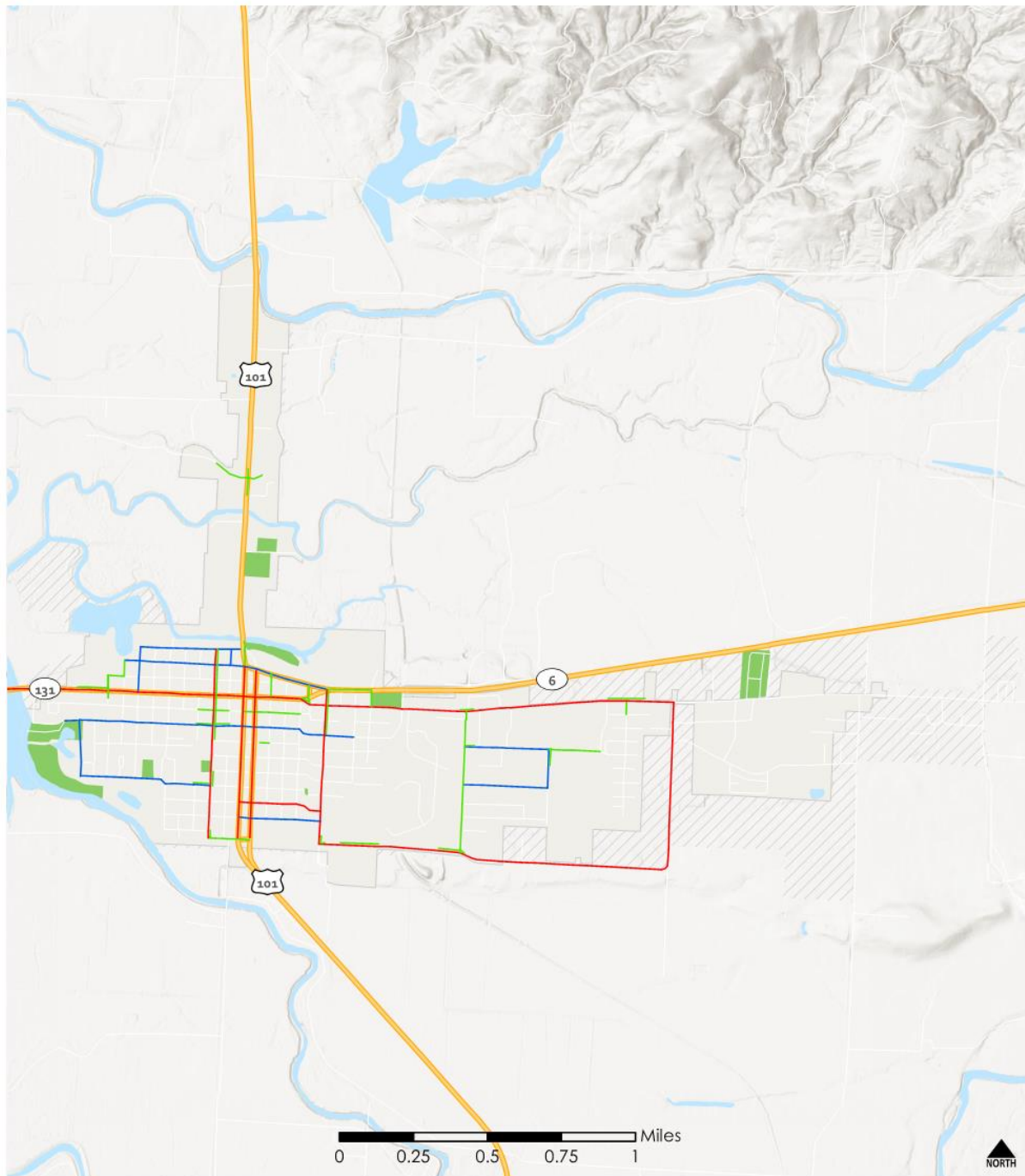
For the Tillamook region, US-101, OR-131, OR-6, Latimer Road, and Wilson River Loop are designated as lifeline routes. US-101 (south of OR-6), OR-131, Latimer Road, Wilson River Loop and OR-6 (between US-101 and Wilson River Loop) are designated as Priority 1 lifeline routes, which means they are essential

for emergency responses in the first 72 hours after an incident. US-101 (north of OR-6) and OR-6 (east of Wilson River Loop) are designated as Priority 2 lifeline routes, which means they are desirable for emergency responses in the first 72 hours after an incident, or are routes essential for economic recovery. Figure 8 shows the local emergency response routes in the city, as well as the de-icing routes that were identified. These are the essential roadways to be cleared after a natural disaster or during hazardous weather conditions.

Figure 9 provides a map and information on tsunami evacuation protocol in Tillamook³. Much of the city is outside of the hazard area. However, an eastern portion of the city, as well as the northern part of the city along US-101, is in the local tsunami evacuation zone.

³ Tsunami Evacuation Map. Oregon Department of Geology and Mineral Industries. Accessed October 2017.
http://www.oregongeology.org/pubs/tsubrochures/TillamookEvac_onscreen.pdf

FIGURE 8. LOCAL ROADWAY PRIORITIZATION MAP



Emergency Prioritization



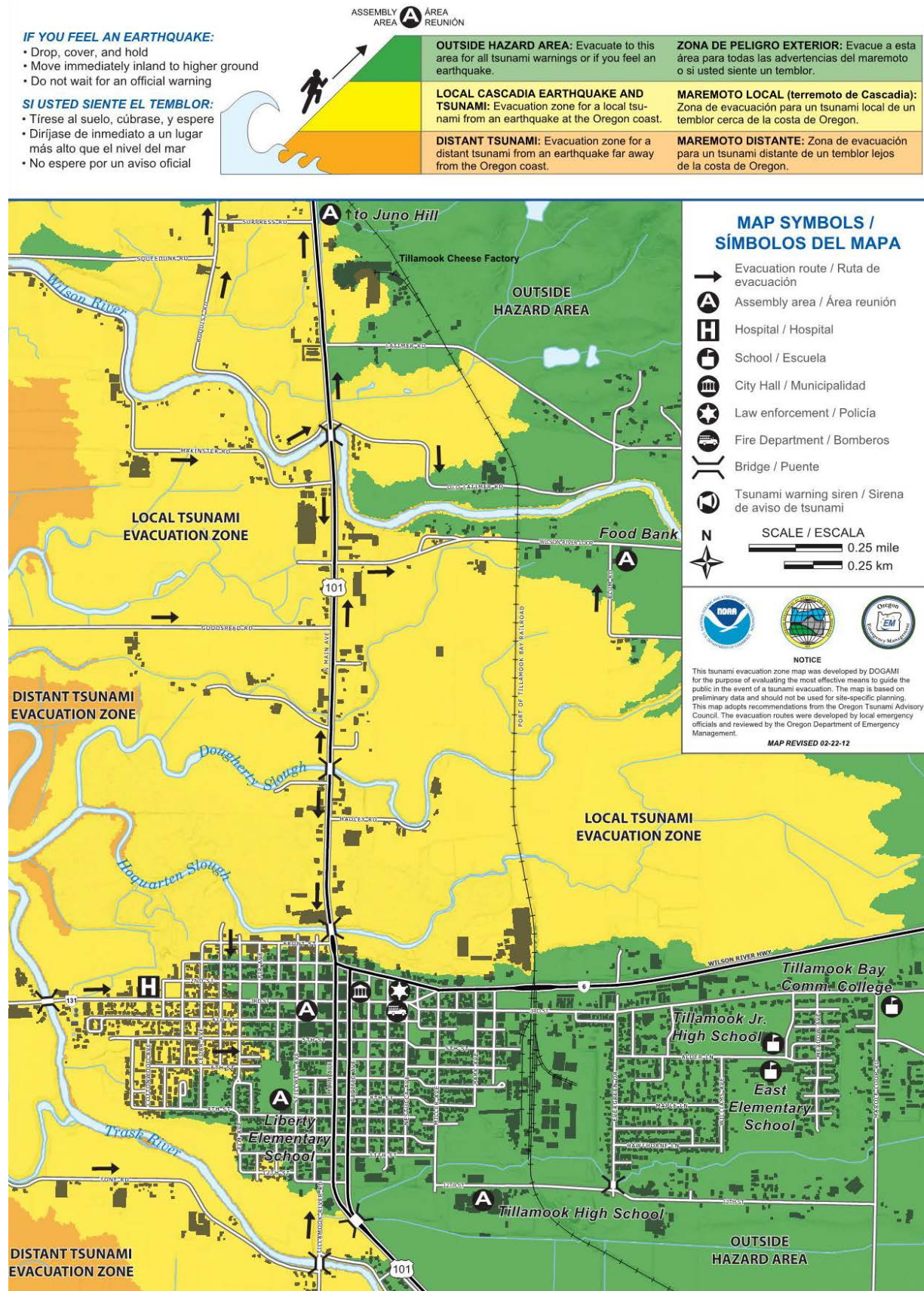
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Legend

- Ice
- Level 1
- Level 2
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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FIGURE 9. TSUNAMI EVACUATION MAP



Enhanced Pedestrian Crossing Treatment Guidelines

The following guidelines are intended to facilitate the development of potential alternatives for improving walking routes. A complete engineering investigation should be conducted prior to selecting an appropriate treatment for a given location.

Unsignalized Intersections and Mid-Block Crossings

Unsignalized Intersections and Mid-Block Crossings can be higher risk locations for people walking. An unsignalized intersection is an intersection not controlled by a traffic signal. Mid-block crossings are used in locations where the pedestrian demand is high, but access points are not conveniently located near an existing intersection. Common locations for mid-block crossings include transit stops, schools, parks and other major destinations that attract high levels of walking and biking traffic.

Enhanced crossing treatments at unsignalized intersections and mid-block crossings could include marked crosswalks, flashing beacons (activated by the pedestrian), curb extensions, pavement markings, and median refuge islands. Other important design elements to consider include lighting, advanced warning signs, and clear, unobstructed drive views.

Signalized Intersection Crossings

Signalized Intersection Crossings provide a greater level of protection and comfort for pedestrians because they more directly control the movement of traffic and are generally more visible to drivers. Basic signalized intersection crossings can be further enhanced through treatments such as leading pedestrian intervals, pedestrian countdown timers, median refuge islands, and curb extensions. A leading pedestrian interval is a brief period at the beginning of a green light where the pedestrian is able to enter the crosswalk before any other traffic is allowed to enter the intersection. This head start improves pedestrian visibility and helps establish them as the priority movement. This treatment is appropriate on all types of streets but is most effective where pedestrian crossings are in conflict with high volumes of right turning traffic or left turns that are allowed to proceed when no pedestrian is present.

Bridge/Overpass Crossings

Bridge/Overpass Crossings include elevated structures that provide pedestrian connections over a major obstacle such as a highway or a river. Pedestrian bridges improve pedestrian safety when properly located and designed, however they can be costly. Design considerations for pedestrian bridges include path width, vertical clearance, ADA requirements and location. Pedestrian bridges are appropriate where there is moderate-to-high pedestrian demand, a large number of children that regularly cross, or over high-speed and high-volume roadways. Pedestrian bridges are often underutilized when their use requires significant out-of-direction travel or effort by the pedestrian and tend to be most effective where topography already creates a moderate elevation difference between the road being crossed and surrounding land.

Additional Design Guidance

Additional design guidance can be found in the National Association of City Transportation Officials (NACTO) Urban Street Design Guide⁴ and American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Planning, Design, and Operation of Pedestrian Facilities⁵.

ITS Coordination Guidelines

Intelligent Transportation System (ITS) planning and coordination is important for Tillamook to consider. The City should follow the Oregon Statewide ITS Plan, including installing conduits for communications systems when building/rebuilding roads along planned ITS corridors. While the statewide ITS plan does not explicitly list devices to be implemented in Tillamook, it is recommended that the City consider the ITS devices that other coastal communities such as Astoria, Gearhart, Seaside, and Wheeler will be implementing in accordance with the statewide plan.⁶ The two most relevant projects for the City of Tillamook to consider are installing photo violation detection at each end of the City on US-101 and creating an Internet Traveler Information Website. Both projects are listed under the short term ITS Implementation Plan for the coastal towns noted previously.

Additionally, the City should coordinate with ODOT for regionwide implementation of ITS devices such as incident dispatch and response teams and technology, local traveler information databases, and regional traffic management centers.

Traffic Impact Analysis Guidelines

Tillamook's development review process is designed to manage growth in a responsible and sustainable manner. By assessing the transportation impacts associated with land use proposals and requiring that adequate facilities be in place to accommodate those impacts, the City is able to maintain a safe and efficient transportation system concurrently with new development, diffusing the cost of system expansion.

Section 153.073(9)(A) of the City's zoning code establishes that a Traffic Capacity Analysis (TCA) may be required, at the discretion of the City Planner or Planning Commission, for any applications that require Site Plan Review. The intent of a TCA is to mitigate the impacts of development on traffic flow, circulation, and safety. The provision establishes a minimum LOS of D for all intersections impacted by a development. Considerations for pedestrian and bicycle usage are also required by this provision, but the provision does not provide specific guidance on how to analyze pedestrian or bicycle traffic.

Section 153.004(8)(P) of the City's zoning code requires that all applications for zone changes, UGB amendments, or conditional use permits be consistent with the planned transportation system. Subsection (c) requires a Traffic Impact Study for amendments that may have a significant impact on transportation facilities. This provision references a "Section XXX – Traffic Impact Study" that does not exist.

The Traffic Capacity Analysis includes following text from Subsection 153.073 9.A:

⁴ *Urban Street Design Guide*, National Association of City Transportation Officials, October 2013.

⁵ *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, American Association of State Highway and Transportation Officials, 2004.

⁶ Oregon ITS Strategic Plan: 1997-2017.

“

A. Traffic Capacity Analysis

1. *The City Planner, or Planning Commission upon their review, may require a proposed development to submit a detailed Traffic Capacity Plan.*
2. *The following requirements are to be dealt with as part of the total Site Development Plan for high traffic generating developments adjacent to highway:*
 - a. *The analysis shall include alternatives for access to the development from highways, country roads, and city streets.*
 - b. *The analysis of alternative accesses should include:*
 1. *Existing daily and P.M. peak hour counts by traffic movements at intersections affected by generate traffic from the development.*
 2. *Projected daily and P.M. peak hour volumes for these same intersections and proposed access points when the development is in full service. This shall be shown by the use of traffic flow diagrams.*
3. *A determination of the existing levels of service and projected levels of service at each intersection and access points studies. These determinations shall be in conformance with nationally accepted capacity manuals or equivalent manuals.*
4. *An analysis of the need for traffic signals. This should include a traffic warrant computation based on the National Manual on Uniform Traffic Control Devices.*
5. *A complete analysis of the trip generation for the development, following the “1976 Institute of Transportation Engineer’s Information Report” Trip Generation or the most current information.*
6. *The recommendations made in the analysis should be specific, and should be based on a minimum level of service “D” when the development is in full service. As an example, if a traffic signal is recommended, the recommendation should include the type of signal control and what movements should be signalized. If storage lanes for right and left turn lanes are needed, the recommendation should include the amount of storage needed. If several intersections are involved for signalization, and an interconnect system is considered, specific analysis should be made concerning progression of traffic between intersections.*
7. *The analysis should also include considerations for bicycle and pedestrian usage of the development. “*

Recommendations

If appropriate, the reference to “Section XXX – Traffic Impact Study” should be corrected to reference Section 153.073(9)(A). While existing code provisions generally address the requirements of a Traffic Impact Study, additional information could clarify requirements and thresholds. Table 6 summarizes the various TIA elements, identifies those that are already captured in existing code, and provides changes to consider for future revisions.

TABLE 6. TIA ELEMENTS AND POTENTIAL CHANGES TO CONSIDER

TIA Elements	Existing Guidance	Sample Guidance	Changes to consider
Requirement Threshold	Required Site Plan review for all projects involving building design and land developments. A TIA must be prepared as part of a development proposal as required by the City Planner or Planning Commission.	<p>TIA required when:</p> <ul style="list-style-type: none"> • Amendment to Comprehensive Plan or Zoning Map • Proposed development or land use change will generate 300+ vehicles per day • Requested by the City Engineer 	Develop a threshold for when a TIA will be required, such as a proposed zoning change or a new development that will generate a significant number of trips.
Application Requirements	N/A	<ul style="list-style-type: none"> • Pre-application conference with City Engineer, County, and ODOT • Prior to report preparation, scope and analysis assumptions of the TIA shall be approved by City Engineer • TIA shall be prepared by an Oregon Registered Professional Engineer 	Require a pre-application conference and scoping memo to be approved by the City Engineer before work on the TIA can begin.
Study Area	N/A	<ul style="list-style-type: none"> • All site access points and intersections adjacent to the proposed development site • All intersections needed for signal progression analysis • Additional locations if existing traffic operation, safety or performance is marginal or substandard 	Explicitly define how the study area should be drawn and which intersections and access points should be considered in the TIA.
Required Contents	N/A	<ul style="list-style-type: none"> • Executive Summary • Existing Conditions • Traffic Forecasts and Impacts • Mitigation Identification • Recommendations 	Set a list of required elements that must be included in the TIA for complete analysis of project impacts.
Existing Conditions Requirements	N/A	<ul style="list-style-type: none"> • Existing traffic volumes within the previous twelve months • Existing street system and characteristics (including multimodal) • Existing intersection operations • Collision data for the most recent three-year period 	Require specific existing conditions elements that inform the amount of impact that the development will have, while also acknowledging any existing issues with the nearby system.
Analysis Periods	Existing daily and PM peak hour counts by traffic movements at intersections affected by generated traffic from development.	<ul style="list-style-type: none"> • Existing Year • Background Conditions in Project Completion 	Explicitly list which analysis periods should be considered for the development impact.

	Projected daily and PM peak hour volumes for the same intersections and proposed access points when the development is in full service (Shown by the use of traffic flow diagrams).	<ul style="list-style-type: none"> • Full Buildout Conditions in Project Completion Year • TSP/Long-Range Plan Horizon Year 	
Mobility Standards	Determination of existing levels of service and projected levels of service and access points – in conformance with nationally accepted capacity manuals or equivalent manuals	<ul style="list-style-type: none"> • Intersection performance determined using the HCM 2000 or a different method with approval from City Engineer • Signalized intersection shall be mitigated to peak hour average delay no greater than 65 seconds per vehicle • V/C ratio for each lane group shall be no greater than 0.98 	Clearly state mobility standards nearby intersections will be required to meet according to the HCM or other reasonable standards.
Trip Generation	Complete analysis of trip generation for the development following most current ITE	<ul style="list-style-type: none"> • Typical average daily trips and peak hour trips using the latest edition of the ITE Trip Generation Manual • The City Engineer may approve different trip generation rates when justified 	Based on periods of analysis, state which type of trips should be used for trip generation, allowing for use of both the most recent ITE manual as well as other rates approved by the City Engineer.
Trip Distribution and Assignment	N/A	<ul style="list-style-type: none"> • Shall be based on trip distribution information from the County or ODOT, based on data less than 12 months old, or alternative data provided by the City Engineer 	Require a logical trip distribution and assignment process for generated trips.
Performance Analysis	N/A	<ul style="list-style-type: none"> • Safety considerations • Geometric design and improvements (traffic signals, turn lanes, etc) • Adequacy of sight distance • Related impacts on bicycle, pedestrian, and transit access 	Explicitly list how the site shall be evaluated with project impacts.
Recommendations	<ul style="list-style-type: none"> • Alternatives for access to the development from highways, country roads, and city streets. • Analysis for the need of traffic signals, traffic 	<ul style="list-style-type: none"> • City's Engineering Design manual for street design standards and construction specifications and Local long-range plans should guide improvements and projects that may be constructed as part of the proposal and mitigation measures • Discuss the estimated levels of impact, improvement, and 	Require a list of reasonable alternatives that are roughly proportional to the impacts of the development.

	<p>warrant computation from the MUTCD.</p> <ul style="list-style-type: none"> Recommendations made should be specific and based on minimum level of service “D” 	<p>mitigations, and demonstrate how the recommended mitigations are roughly proportional to the identified impacts</p>	
Multimodal Considerations	<p>Analysis should include considerations for bike/ped usage of the development.</p>	<ul style="list-style-type: none"> Proposed improvements and mitigation measures will provide safe connections when bicycle or pedestrian facilities are present or planned 	<p>State that multimodal considerations should be made in both existing and future conditions.</p>
Approval Criteria	N/A	<ul style="list-style-type: none"> The analysis demonstrates that adequate transportation facilities exist to serve the proposed development or identifies mitigation Proposed improvements are designed and will be constructed to the street standards specific in the Engineering Design Manual and access standards 	<p>Explicitly provide approval criteria that the TIA will need to meet for development to be approved.</p>
Conditions for Approval	N/A	<ul style="list-style-type: none"> The City may deny, approve, or approve with conditions needed to meet operations and safety standards Additional street, bicycle, and pedestrian connections may also be required 	<p>List conditions that TIA may be approved with.</p>

Neighborhood Traffic Management Tools

Neighborhood Traffic Management (NTM) describes strategies that can be developed to slow traffic, and potentially reduce volumes, creating more inviting environment for people walking and biking. NTM strategies are primarily traffic calming techniques for improving neighborhood livability on local streets, though a limited set of strategies can also be applied to collectors and arterials, (Table 7). Mitigation measures for neighborhood traffic impacts must balance the need to manage vehicle speeds and volumes with the need to maintain mobility, circulation, and function for service providers, such as emergency responders. The toolkit (Figure 10) provides examples of commonly used NTM strategies that Tillamook could consider for future applications.

Any NTM project should include coordination with emergency response staff. General comments from the Tillamook Fire District regarding traffic calming measures include:

- Mountable curbs with curb extensions.
- Speed cushions and speed humps designed to allow fire apparatus to move relatively smoothly, accommodating appropriate length, height, and distance between cushions/humps.

- Traffic circles should be large enough so for firetrucks to maneuver through.⁷

Furthermore, priority routes should be identified in conjunction with emergency response staff to avoid the application of NTM strategies. NTM strategies implemented on a state freight route such as US-101 will require input from ODOT regarding freight mobility considerations.

FIGURE 10. SUMMARY OF NEIGHBORHOOD TRAFFIC MANAGEMENT STRATEGIES

Chicanes



[www.pedbikeimages.org/Dan Burden](http://www.pedbikeimages.org/Dan_Burden)

Chokers



[www.pedbikeimages.org/Dan Burden](http://www.pedbikeimages.org/Dan_Burden)

Curb Extensions



[www.pedbikeimages.org/Carl Sundstrom](http://www.pedbikeimages.org/Carl_Sundstrom)

Diverters



[www.pedbikeimages.org/Adam Fukushima](http://www.pedbikeimages.org/Adam_Fukushima)

Median Islands



[www.pedbikeimages.org/Dan Burden](http://www.pedbikeimages.org/Dan_Burden)

Raised Crosswalks



[www.pedbikeimages.org/Tom Hamed](http://www.pedbikeimages.org/Tom_Hamed)

Speed Cushions



NACTO Urban Street Design Guide

Speed Hump



[www.pedbikeimages.org/Dan Burden](http://www.pedbikeimages.org/Dan_Burden)

Traffic Circles



[www.pedbikeimages.org/Carl Sundstrom](http://www.pedbikeimages.org/Carl_Sundstrom)

⁷ New fire trucks in 2018 are 10'6" and 14' with outriggers out.

TABLE 7. APPLICATION OF NEIGHBORHOOD TRAFFIC MANAGEMENT STRATEGIES

NTM Application	Use by Functional Classification			Impact	
	Arterials	Collectors	Local Streets	Speed Reduction	Traffic Diversion
Chicanes			✓	✓	✓
Chokers			✓	✓	✓
Curb Extensions	✓	✓	✓	✓	
Diverter (with emergency vehicle pass through)		✓	✓		✓
Median Islands	✓	✓	✓	✓	
Raised Crosswalks			✓	✓	✓
Speed Cushions (with emergency vehicle pass through)			✓	✓	✓
Speed Hump			✓	✓	✓
Traffic Circle			✓	✓	✓

The City of Tillamook currently does not have a formal neighborhood traffic management program. If such a program were desired to help respond to future issues, suggested elements include:

- A formalized process for citizens who are concerned about the traffic on their neighborhood street. The process could include filing a citizen request with petition signatures and a preliminary evaluation. If the evaluation finds cause for concern, a neighborhood meeting would be held and formal data would be collected and evaluated. If a problem is found to exist, solutions would be identified and the process continued with neighborhood meetings, feedback from service and maintenance providers, cost evaluation, and traffic calming device implementation. Six months after implementation the device would be evaluated for effectiveness.
- For land use proposals, in addition to assessing impacts to the entire transportation network, traffic studies for new developments must also assess impacts to residential streets. A recommended threshold to determine if this additional analysis is needed is if the proposed project at ultimate buildout increases through traffic on any one residential street by 200 or more vehicles per day. Once the analysis is performed, the threshold to determine if residential streets are impacted would be if their daily traffic volume exceeds 1,200 vehicles.

Stop Sign Prioritization Strategy

The Manual on Uniform Traffic Control Devices (MUTCD) has guidance on traffic control at intersections for Two-Way Stop-Control, All-Way Stop-Control, and Traffic Signals. Existing guidance on Two-Way Stop-Control Orientation, found in Section 2B.06⁸ includes the requirement of one or more of the following conditions:

- Meeting a threshold for vehicular traffic volumes on the through street
- Restricted view of conflicting traffic
- Safety concerns and crashes

For broader strategy, guidance is provided in draft form from the National Committee on Uniform Traffic Control Devices (NCUTCD). The potential revision of the existing MUTCD guidance is based on NCHRP project 03-109⁹, but notably this guidance is not adopted as part of the MUTCD. In addition to the criteria provided by the MUTCD listed above, the NCUTCD advises that the selection of the minor road to be controlled by a stop sign should be based on one or more of the following criteria:

- A roadway intersecting a designated through or numbered highway
- A roadway with the lower functional classification
- A roadway with the lower traffic volume
- A roadway with the lower speed limit
- A roadway that intersects with a roadway that has a higher priority for one or more modes of travel

Additional guidance for the installation of Stop signs when two roadways have relatively equal volumes, speeds, and or other characteristics intersect can be found in the NCUTCD Proposal for Changes Item Number 15B-RW-02.¹⁰ Ultimately, the use of Stop signs on the minor-street approaches should be determined with best engineering judgement.

Freight Routes

Streets designated as Truck Routes in Tillamook are recognized as being appropriate and commonly traveled corridors for truck passage. Decisions affecting maintenance, operation, or construction on a designated truck route must address potential impacts on the safe and efficient movement of truck traffic. However, the intent is not to compromise the safety of other street users to accommodate truck traffic, especially in areas where many conflicts may be present. In such areas, the operational objectives of the street should prioritize safe travel for vulnerable users (e.g., pedestrians and bicyclists) while continuing to accommodate passage by truck traffic. On-street parking along truck routes should be discouraged where feasible.

⁸ Section 2B.06 STOP Sign Applications, 2009 Manual on Uniform Traffic Control Devices, <https://mutcd.fhwa.dot.gov/hm/2009/part2/part2b.htm#section2B05>

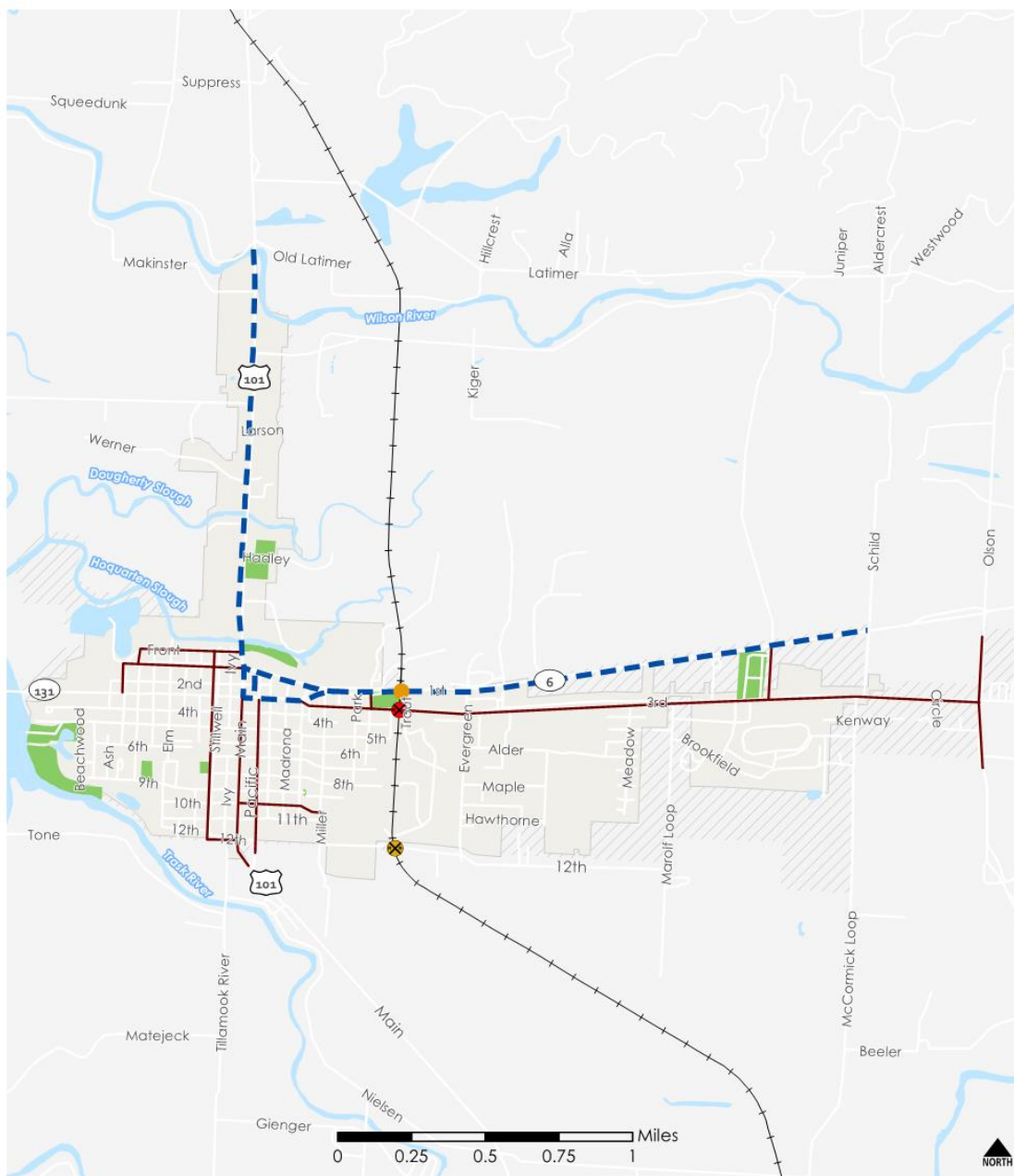
⁹ Fitzpatrick, Kay, et. al., *Potential MUTCD Criteria for Selecting the Type of Control for Unsignalized Intersections*, NCHRP Project 03-109, March 2015.

¹⁰ Item 15B-RW-02, NCUTCD Proposal for Changes to the Manual on Uniform Traffic Control Devices, Regulatory & Warning Signs Technical Committee, Revisions of MUTCD sections 2B.04, 2B.06, 2B.07, 2B.09. Approved by NCUTCD Council January 8, 2016. <http://ncutcd.org/wp-content/uploads/meetings/2016A/Attach-No.2-15B-RW-02-UnsignalizedIntersections-Appvd-1-8-16.pdf>

Freight Routes in Tillamook

Tillamook has designated various roads in the city as truck routes in addition to the state freight routes designated in the OHP. The truck routes provide a connection between state facilities and major freight destinations in the city (TP Freight Lines, Tillamook Lumber Company, and industrial businesses on Front Street). The city's designated freight routes are shown in Figure 11.

FIGURE 11. FREIGHT AND RAIL FACILITIES



Freight and Rail Facilities



Legend

- +— Railroad
- Gated Crossing
- ⊗ Signed Crossing
- Rail Overcrossing
- State Freight Route*
- City Freight Route
- *Also designated as Reduction Review Route
- Waterbodies
- Parks
- City of Tillamook
- Urban Growth Boundary

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Proposed Freight Routes

US-101 (south of the downtown core and Main/Pacific couplet) and OR-131 are not classified as freight routes in the OHP, but trucks use these state and regional facilities to access Tillamook.

FIGURE 12. PROPOSED FREIGHT ROUTES IN TILLAMOOK

[placeholder for future figure]

Appendix K

US-101 Pedestrian Crossings Study



Tillamook

Final US-101 Pedestrian Crossing Study

January 25, 2019

Prepared for: Paul Wyntergreen, City of Tillamook
Ken Shonkwiler, ODOT

Prepared by: Carly Dutkiewicz, Jacobs
Eddie Montejo, Jacobs
Ryan Farncomb, Jacobs



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1 Introduction

1.1 Study Purpose

As part of the Tillamook TSP Update, the project team identified a need to conduct a pedestrian crossings study on US-101 (a state-owned facility) based on feedback from the City of Tillamook, ODOT, and the Project Advisory Committee (PAC). The purpose of the study is to describe crossing needs on US-101 north and south of downtown Tillamook, including the exact locations where crossings, pedestrian signalization, and signage ought to be deployed to increase crossing safety and comfort. The results of this study will be coordinated with the pedestrian system recommendations made as part of the Tillamook TSP update.

1.2 Study Area

The City of Tillamook is located in western Tillamook County, on the southeast end of Tillamook Bay. The City is about 60 miles west of Portland and less than 10 miles from the Oregon coast. This study evaluates US-101 from 3rd Street south to 12th Street in downtown Tillamook (Figure 1). This study also evaluates US-101 north of downtown, from the Hoquarton Slough to the northern City limits near Makinster Road (Figure 2). US-101 is a state-owned highway that bisects the City east-west and connects Tillamook to the communities of Garibaldi and Bay City to the north and Lincoln City to the south. US-101 is the southbound Main Avenue / northbound Pacific Avenue one-way couplet in downtown Tillamook and is the backbone of the City's transportation system. North of downtown at Front Street, the US-101 couplet converges to become a 5-lane facility through the northern extent of the City limits near Makinster Road.

1.3 US-101/OR-6 Traffic Improvement Project

ODOT, in cooperation with the City of Tillamook and Tillamook County, is nearing completion of a project to improve traffic performance and safety on US-101 and OR-6 through downtown Tillamook and across Hoquarton Slough.

The project lengthened the US-101 couplet to the Hoquarton Slough by extending Pacific Avenue north beyond 1st Street and replacing the existing slough bridge with a new four-lane bridge. The project also widened the travel lanes on Main and Pacific Avenues from 1st to 4th Streets and turn lanes were added at key intersections through town.

In addition to improving vehicle traffic operations, the project will improve pedestrian movement and safety in downtown Tillamook by providing new crosswalks. Figures 3 and 4 show marked crossings, stop lights, stop signs, and curb bulbouts where they exist now and when the US-101/OR-6 Traffic Improvement Project is complete.

2 Evaluation Criteria

This section outlines traffic engineering practices for crosswalks from the ODOT Traffic Manual. The criteria were used to assess crossings in the study area to determine which locations and/or types of crossing improvements to invest in.



2.1 State Guidance

2.1.1 Criteria Marking Crosswalks in Engineering Studies

Refer to Table 1 for considerations that should be addressed in an Engineering Study.

2.1.2 Criteria for Marking Crosswalks at Uncontrolled Intersections

Marked crosswalks at uncontrolled locations on the state highway require State Traffic-Roadway Engineer Approval and the ODOT Traffic Manual outlines traffic engineering practices for crosswalks. Generally, marked crosswalks are discouraged at uncontrolled approaches due to a concern that they may not improve safety and may, if inappropriate, put a pedestrian more at risk. The criteria are primarily restrictions on marking crosswalks in locations that would be potentially hazardous. In situations where the pedestrian volumes justify marking crosswalks (well above minimum threshold levels), additional safety measures (i.e., pedestrian refuges) should be considered above and beyond marking. Installation of a marked crosswalk will not, in and of itself, increase the level of safety for pedestrians. Marked crosswalks should only be considered at uncontrolled approaches when an engineering study demonstrates their need and the location meets the following criteria outlined in Table 1.

2.1.3 Criteria for Marking Crosswalks at Mid-Block Locations

Installations of mid-block crosswalks are discouraged for the same reasons uncontrolled approaches are discouraged. Mid-block crosswalks often do not get good compliance from motorists. Only consider mid-block crosswalks when an engineering study demonstrates their need and the location meets the criteria outlined in Table 1.

2.1.4 Criteria for Marking School Crossings at Uncontrolled Locations

When establishing marked school crossings across uncontrolled locations the applicable criteria for marking crosswalks should be followed (see Table 1). Generally, school crossings are established based on School Route Plans and are sited to take advantage of existing traffic controls such as traffic signals. Where existing traffic controls are not available, and it is not feasible to require children to walk out of direction a marked crosswalk may be established.

The number and age of the students using the crossing should be taken into consideration. Adult crossing guards should be considered for established school crossings at uncontrolled locations where gaps are not sufficient to permit a reasonably safe crossing.

2.1.5 Appropriate Spacing for Crosswalks

Over-use of cross walks is a violation of standard practice, creates a potential liability exposure, and creates an increase in maintenance costs. Mid-block crosswalks should be more than 300 feet to nearest crossing or marked crosswalk. If the crosswalk is not controlled by a traffic signal, stop sign or yield sign, there should be no other crosswalks within 250 feet of the crosswalk.

2.1.6 Removing Crosswalks and Closing Crossings

Removing or closing any approved marked crosswalks at uncontrolled locations, officially closing any crossings (currently marked or unmarked) and marking any new uncontrolled crossings on the State Highway System requires approval of the State Traffic-Roadway Engineer. However, unapproved marked crosswalks can be removed without State Traffic-Roadway Engineer approval. If a crosswalk approved for closure, appropriate signing shall be installed in accordance with this manual and the ODOT Highway Design Manual. All requests for crosswalk closures or removals shall be submitted to the State Traffic-



Roadway Engineer with an engineering study substantiating a geometric design or operational concern that adversely impacts pedestrian safety.

FIGURE 1. STUDY AREA - DOWNTOWN TILLAMOOK, 3RD STREET TO 12TH STREET

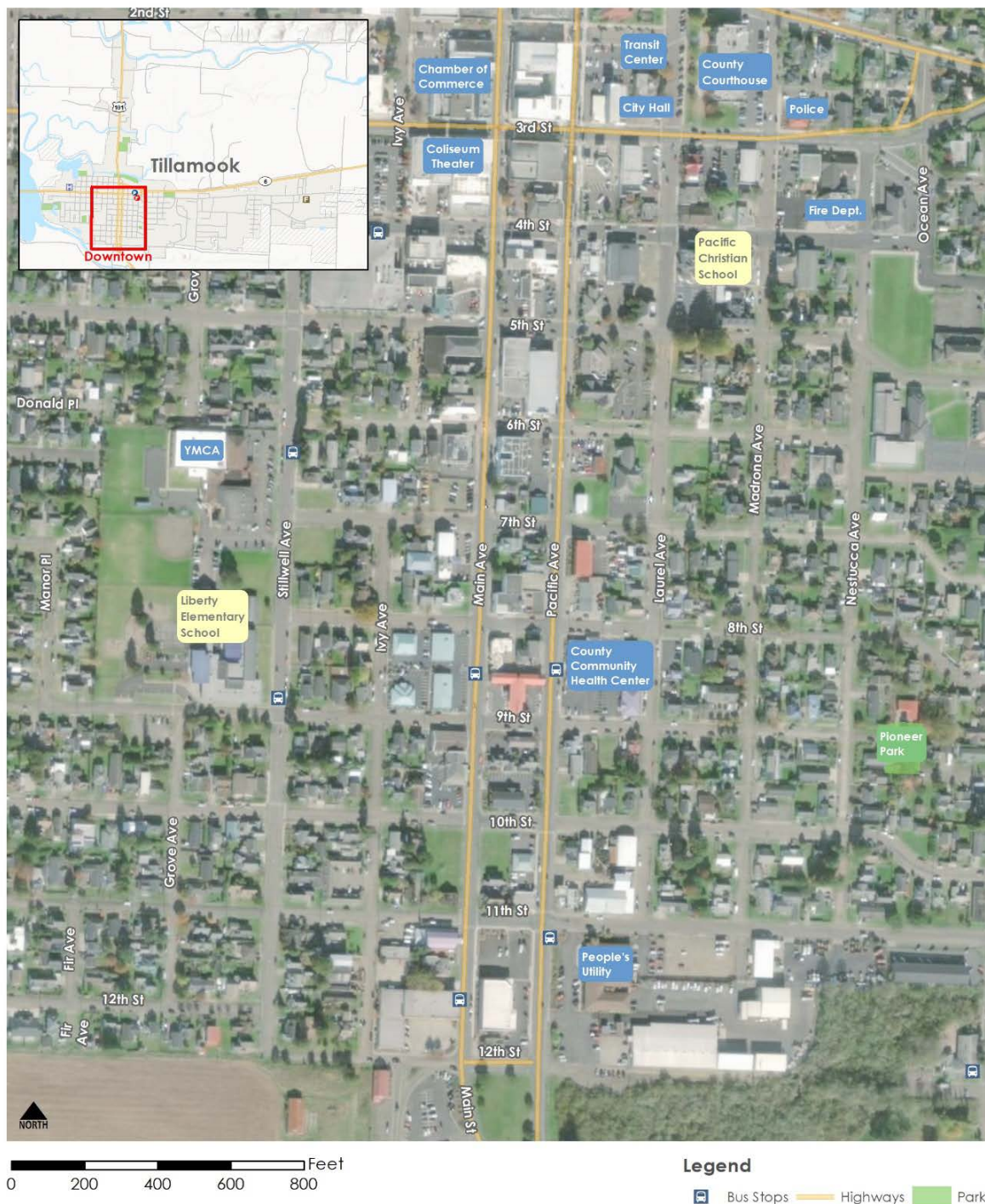




FIGURE 2. STUDY AREA – NORTH OF DOWNTOWN, HOQUARTON SLOUGH TO MAKINSTER ROAD



City of Tillamook, Oregon
Transportation System Plan

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FIGURE 3. EXISTING PEDESTRIAN INFRASTRUCTURE, DOWNTOWN TILLAMOOK

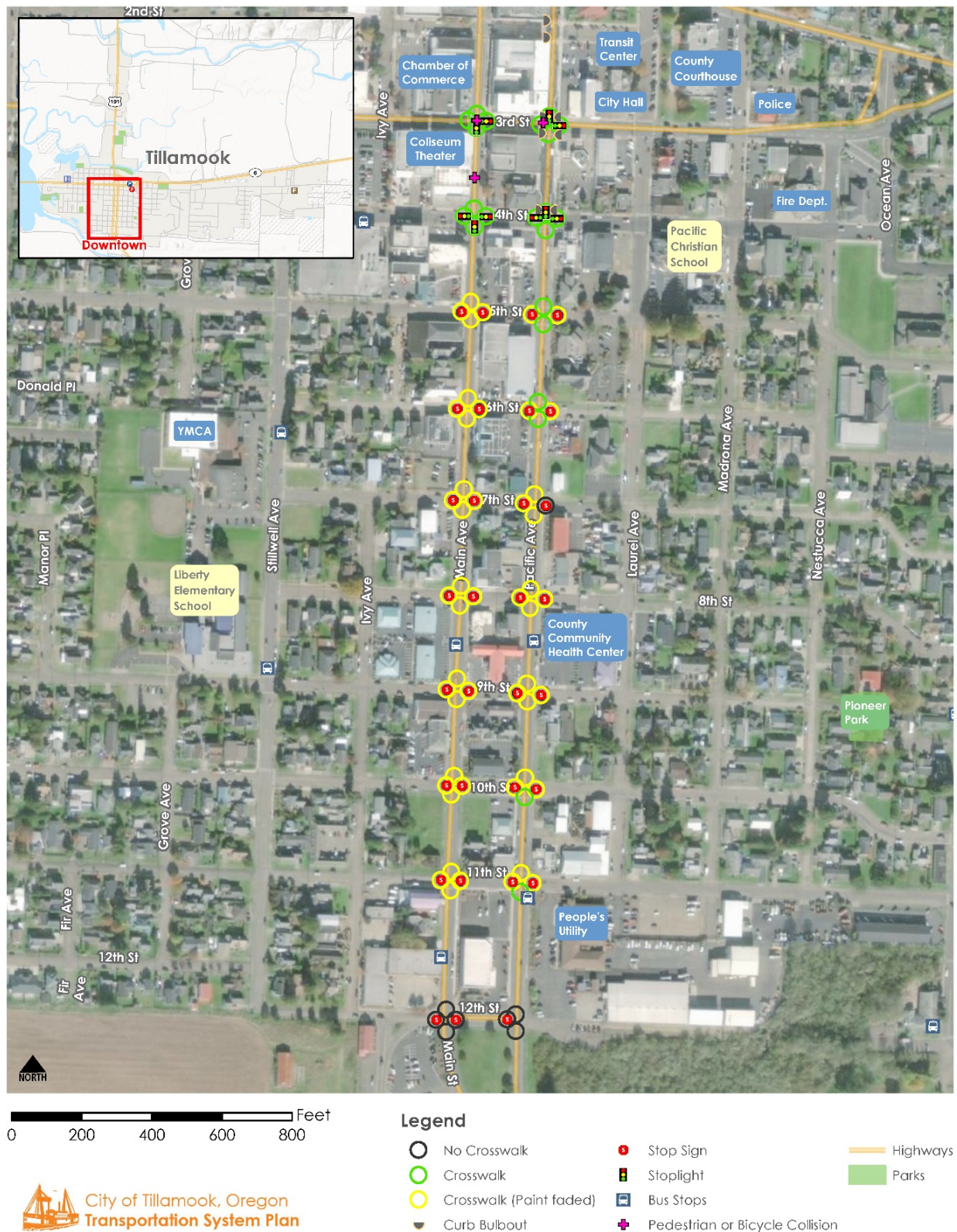
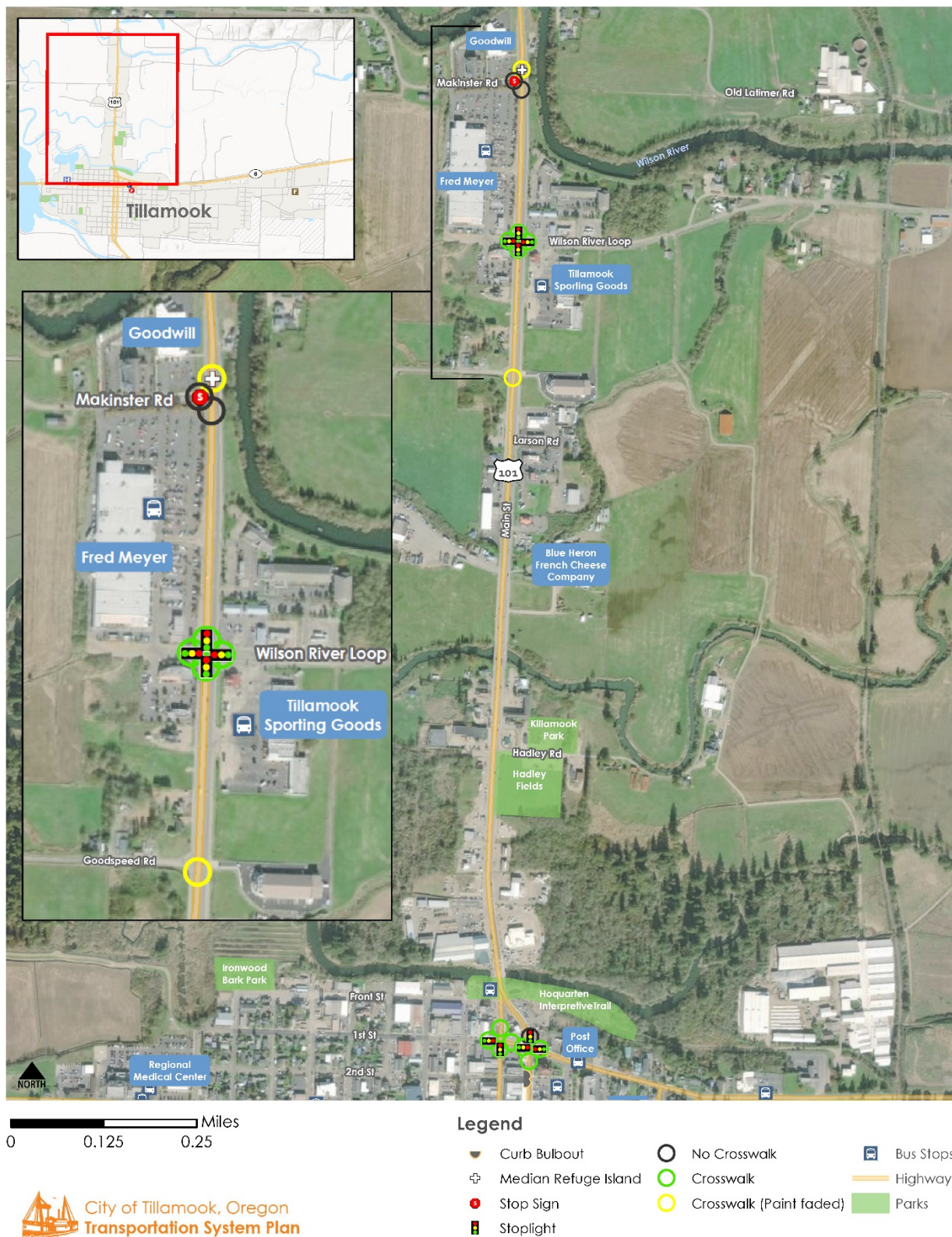




FIGURE 4. EXISTING PEDESTRIAN INFRASTRUCTURE, NORTH OF DOWNTOWN



**TABLE 1 ODOT CRITERIA FOR CROSSWALKS**

Marking Crosswalks in Engineering Studies	Marking Crosswalks at Uncontrolled Intersections	Marking Crosswalks at Mid-Block Locations
<p>Required Criteria</p> <ul style="list-style-type: none"> Marked crosswalks at other than signalized intersections or stop-controlled approaches should be used selectively. Allowing a proliferation of marked crosswalks may reduce the overall effectiveness of marking crosswalks. Consideration must be given to concerned citizens, civic groups, and neighborhood organizations; balancing engineering judgment with perceived public need. The roadway design features that influence the pedestrians' ability to cross the street, e.g., street width, presence of a median, one-way versus two-way operation, and geometrics of the highway or intersection being crossed, all need to be included in the planning of the crosswalk. Other pedestrian design improvements such as curb extensions and pedestrian refuges should be encouraged to increase the safety of the crossing. A three to five-year pedestrian crash history should be obtained. The walking path of the pedestrian. Will marking crosswalks encourage pedestrians to use a single point of crossing rather than choosing random crossing points? There should be opportunities for crossing (sufficient gaps in traffic) Uncontrolled marked crosswalks may be continental crosswalk marking and should be accompanied by other enhancements such as 	<p>Required Criteria</p> <ul style="list-style-type: none"> There is good visibility of the crosswalk from all directions, or it can be obtained. Stopping sight distance is a minimum. There is no reasonable alternative crossing location. There is established pedestrian usage. Considerations include: volume of pedestrians, opportunity for safe crossing (i.e., sufficient gaps in traffic), percentage of elderly or young children, and the nature of the attraction. Lower pedestrian volumes would be acceptable for areas where there is greater proportion of less experienced and less agile pedestrians (e.g., near schools and/or elderly housing areas) Posted speeds should be 40 mph or less. Traffic Volumes should be 10,000 or less ADT. If above 10,000 ADT raised median islands should be included. On multi-lane highways, pedestrian crossing enhancements (curb extensions and/or pedestrian refuges) should be considered. 	<p>Required Criteria</p> <ul style="list-style-type: none"> There is good visibility of the crosswalk from all directions or it can be obtained. Stopping sight distance is a minimum. Posted vehicular speeds should be 40 mph or less. There is not a reasonable alternative at a stop-controlled intersection. There is established pedestrian usage. Considerations include: volume of pedestrians, opportunity for safe crossing (i.e., sufficient gaps in traffic), percentage of elderly or young children, and the nature of the attraction. Lower pedestrian volumes would be acceptable for areas where there is greater proportion of less experienced and less agile pedestrians (e.g. near schools and/or elderly housing areas). Locations should be more than 300 feet to nearest crossing or marked crosswalk. Traffic Volumes should be less than 10,000 ADT or if above 10,000 ADT raised median islands should be included. Pedestrian crossing enhancements (curb extensions and/or pedestrian refuges) should be considered. <p>Optional Criteria</p> <ul style="list-style-type: none"> Where a marked crosswalk can concentrate or channelize multiple pedestrian crossings to a single location. Free turning movements or other operational



Marking Crosswalks in Engineering Studies	Marking Crosswalks at Uncontrolled Intersections	Marking Crosswalks at Mid-Block Locations
<p>pedestrian refuge islands, bulb-outs, pedestrian signs etc.</p> <ul style="list-style-type: none"> • There should be adequate sight distance for the motorist and the pedestrian, or it can be obtained. This includes examination of on-street parking, street furniture (e.g., mailboxes, utility poles, newspaper stands), and landscaping. Corrective measures should be taken wherever possible. • All crosswalk locations should be investigated for adequate illumination where there is prevalent nighttime pedestrian activity. • Mid-block and school crossings must be supplemented with crosswalk signs • Mid-block crosswalks should not be located immediately downstream from bus stops. • For mid-block crosswalks: are there more reasonable locations pedestrians could cross, i.e., no more than a block (300 feet) from a location being considered? 		<p>considerations inhibit pedestrian crossing opportunities at the nearest intersection.</p> <ul style="list-style-type: none"> • Established bus stops where riders need access to the opposite side of road from the bus stop where the stop can't be relocated.



3 Existing Conditions

3.1 Population and Demographics

As of 2017, the City of Tillamook had a population of 4,930. As compared to the state, the City has younger residents, a less diverse population, and a higher number of residents living below the poverty threshold.

3.2 Land Use

Low and medium density residential development is concentrated in the downtown area east and west of US-101 Main and Pacific Avenues (the US-101 couplet) and south of OR-6/OR-131 (3rd Street). Much of the City's multifamily downtown residential development is located immediately adjacent to OR-6/OR-131 (1st and 3rd Streets). Commercial development is primarily located in downtown Tillamook and north along US-101, where numerous shops, restaurants, and community destinations are located. The land uses adjacent to US-101 north of downtown between Makinster Road and Front Street are primarily commercial, light industrial, and open spaces with little residential development. Schools located near the study area include Liberty Elementary School (1700 9th Street), Tillamook High School (2605 12th Street), and Pacific Christian School (2203 4th Street).

3.3 Transit

The Tillamook County Transportation District operates the Tillamook Town Loop (Route 1) bus service through the town of Tillamook. The service runs hourly on Monday through Sunday. The loop originates and ends at the Tillamook Transit Center in downtown Tillamook. There are 15 total stops along the route. Community destinations along the route include Tillamook High School, the Tillamook Department of Human Services (DHS) Office, Goodspeed Park, the Tillamook Cheese Factory, the Tillamook Library, and the Tillamook Regional Medical Center. Four bus stops exist within the study area – along US-101 Main and Pacific Avenues between 3rd and 12th Streets:

- 8th and Main, located along US-101 Main Avenue between 8th and 9th Streets
- Health Dept, located along US-101 Pacific Avenue between 8th and 9th Streets, in front of the Tillamook County Family Health Center
- Showplace South, located along US-101 Main Avenue between 11th and 12th Streets, in front of Roby's Furniture & Appliance Discount Center
- Tillamook PUD, located at the southeast corner of US-101 Pacific Avenue and 11th Street

3.4 Freight

US-101 is the City's major freight route¹. Consequently, US-101 experiences heavy freight traffic. Truck vehicle percentages along US-101 during the PM peak hour range from 3 to 5 percent. The highest truck volume occurs on the southbound approach of US-101 SB (Main Avenue) at OR-6 WB (1st Street), with

¹ US-101 is designated as a state freight route north of 3rd Street and is a city freight route south of 3rd Street along the couplet. South of the couplet, US-101 is not designated as a freight route.



44 vehicles in an hour. Despite heavy freight traffic, traffic operations at 10 intersections analyzed along US-101 meet volume-to-capacity (v/c)² mobility targets and operate a Level of Service (LOS)³ C or better.

3.5 Pedestrian Network

Tillamook's pedestrian network primarily consists of sidewalks, roadway shoulder paths, marked crossings, and curb ramps. Most of the marked crosswalks in the City are near the downtown core along US-101 Main and Pacific Avenues. Marked crosswalks are located near pedestrian generators, such as schools, the YMCA facility on Stillwell Avenue, and Tillamook Regional Medical Center. The condition of the markings varies from location to location, and most intersections with marked crosswalks are striped on all approaches.

North of downtown between Front Street and Makinster Road, US-101 has continuous sidewalks on both sides of the street. There are only two marked crossings in this extent. One is the northernmost crossing in the City at Makinster Road, which features a marked crosswalk, a median refuge island, and bollards. The second is at the intersection at Wilson River Loop, which features a four-way traffic signal, marked crosswalks on all four legs, and pedestrian-activated signal phasing.

The City's current crosswalk policy to is apply continental hash markings at any intersection where new paint or reapplication is needed. The presence of traffic signals and curb "bulbouts" at these intersections varies from location to location; the US-101/OR-6 project installed bulbouts in the north end of the study area. Figures 3 and 4 display existing pedestrian infrastructure in downtown Tillamook and north of downtown, respectively.

3.6 Pedestrian Volumes

The majority of pedestrian traffic occurs in the downtown area centered at US-101 SB (Main Avenue), US-101 NB (Pacific Avenue), OR-6 (3rd Street), and 4th Street. Pedestrian volumes at the study intersections for the PM peak hour and for a four-hour PM period are summarized in Table 2, based on data collected during the summer months. The four-hour volumes are useful to get a sense of pedestrian travel patterns over time, since pedestrian volumes often do not peak at the same time as motor vehicle volumes. Of the ten intersections analyzed in the study area, four intersections have approximately 50 pedestrians during the peak hour, which generally accounts for approximately 25 to 40 percent of the total four-hour pedestrian volume. These intersections are:

- US-101 SB (Main Ave)/OR-6 EB (3rd St)
- US-101 NB (Pacific Ave)/OR-6 EB (3rd St)
- US-101 SB (Main Ave)/4th St
- US-101 NB (Pacific Ave)/4th St

² Volume-to-capacity is a comparison of traffic volume demand to intersection capacity. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When it is closer to 0, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays and developing queues.

³ At both stop-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.



The intersections at the southern limit of the downtown study area tend to have a lower share of pedestrian activity. The intersection of US-101 SB (Main Ave)/11th St had only six pedestrians observed during the peak hour, and 23 observed during the four-hour period. Similarly, the intersection of US-101 NB (Pacific Ave)/11th St had ten pedestrians observed during the peak hour, and 24 observed during the four-hour period. Greater numbers of pedestrians are noted at crossings with 3rd and 4th Streets (Table 2); crossings at these locations have been recently improved.

North of downtown generally experiences less pedestrian activity than the downtown study area. The intersection of US-101 and Wilson River Loop only had ten pedestrians observed during the peak hour, and 29 observed during the four-hour period. Anecdotal evidence from ODOT suggests that there is pedestrian demand at the intersections of US-101 and Hadley and Makinster Roads.

TABLE 2 STUDY INTERSECTION PEDESTRIAN VOLUMES

	Peak Hour Volume (4:20-5:20 PM or 4:50-5:50 PM)					Four Hour Volume (2-6 PM)				
Intersection	North	South	East	West	Total	North	South	East	West	Total
US-101/Wilson River Loop	2	8	0	0	10	5	12	3	9	29
US-101 SB (Main Ave)/Front St	0	0	5	1	6	0	2	14	7	23
US-101 SB (Main Ave)/OR-6 WB (1st St)	0	11	0	14	25	1	26	0	19	46
US-101 NB (Pacific Ave)/OR-6 WB (1st St)	1	7	0	0	8	1	11	5	7	24
US-101 SB (Main Ave)/OR-6 EB (3rd St)	21	11	8	13	53	62	44	46	68	220
US-101 NB (Pacific Ave)/OR-6 EB (3rd St)	19	9	16	9	53	78	28	49	38	193
US-101 SB (Main Ave)/4th St	14	22	8	20	64	54	42	22	75	193
US-101 NB (Pacific Ave)/4th St	16	19	4	9	48	39	49	17	21	126
US-101 SB (Main Ave)/11th St	0	1	1	4	6	0	7	4	12	23



US-101 NB (Pacific Ave)/11th St	3	3	3	1	10	6	10	4	4	24
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3.7 Pedestrian Crossing Patterns

Sidewalks are critical for young children, older adults, and individuals with mobility challenges. Schools, transit stops, and major area destinations generate significant pedestrian demand. In particular, the YMCA and Liberty Elementary School contribute to high volumes of pedestrians. The PAC identified frequented crossings in the study area, which include:

- US-101 at 7th, 8th, and 9th Streets. The PAC noted that many students cross at these streets to reach the schools and YMCA.
- US-101 at 11th Street. This is also the southernmost through street across US 101 in the City and is part of the bicycle network as well. The PAC noted that students at the High School use this crossing.

ODOT also noted that there is crossing demand on US-101 at Hadley Road, comprised of people trying to reach nearby commercial areas and recreation opportunities at Hadley Fields. There is currently no improved crossing in this location. Where crosswalks are lacking or in need of improvement, pedestrians have been known to cross the road with changing directions and speeds that result in curved paths and higher chances of safety issues. This is problematic on the segment of US-101 north of Hoquarton Slough, where crossings are infrequent, and pedestrians have been known to run across the road.

3.8 Crashes

The crash analysis included a review of severe crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2011, and December 31, 2015, which were the five most recent full years for which crash data were available at the time of the analysis, shown in Table 3 below. Bicycle crashes are included because both bicyclists and pedestrians are vulnerable road users who benefit from improved urban crossing environments. In addition, bicyclists generally start and end their trips as pedestrians are likely to use many of the same improvements, including marked crossings, signage, and pedestrian-activated signals. Although all the listed crashes were coded as severe (class B or C), no pedestrian or bicycle fatalities were reported during this period.

Table 3 also differentiates between pedestrian crashes and *pedestrian-involved* crashes, as this can often tell a story about pedestrian activity and user behaviors in a similar way to pedestrian crashes. Pedestrian-involved crashes are vehicle-to-vehicle crashes that were caused by pedestrian activity, but a pedestrian wasn't struck. These crashes are coded as a crash *cause* as opposed to pedestrian crashes which are a crash *type*.

Pedestrian and bicycle crashes in the study area are also shown in Figures 5 and 6 below.

**TABLE 3. HISTORICAL BICYCLE AND PEDESTRIAN/PEDESTRIAN INVOLVED CRASHES ON US-101**

Date of Crash	Location	Type
2/9/2016	Pacific and 11th Street	Pedestrian Crash
1/22/2016	US-101 and Makinster Road	Pedestrian Involved Crash
9/14/2015	Main and 3rd Street	Pedestrian Crash
9/3/2015	Main and Front Street	Bike Crash
7/2/2015	Main and Front Street	Bike Crash
3/26/2015	Main and 4th Street	Bike Crash
12/4/2014	Pacific and 3rd Street	Pedestrian Crash
8/6/2014	US-101 and Makinster Road	Pedestrian Involved Crash
5/19/2014	Main and 7th Street	Pedestrian Involved Crash
12/12/2013	US-101 and Hadley Road	Bike Crash
12/11/2013	Pacific and 5th Street	Pedestrian Involved Crash
11/10/2013	US-101 and Wilson River Loop	Pedestrian Crash
10/1/2013	Pacific and 4th Street	Bike Crash
8/9/2012	Main and 6th Street	Bike Crash
6/29/2012	Main and Werner Road	Bike Crash
3/16/2012	Main and 2nd Street	Pedestrian Involved Crash
2/27/2012	US-101 and Wilson River Loop	Pedestrian Involved Crash
1/16/2012	Main and 9th Street	Pedestrian Involved Crash
12/1/2011	Main and 4th Street	Pedestrian Crash
8/28/2011	Main and 5th Street	Bike Crash
8/1/2011	Main and 12th Street	Bike Crash

Source: ODOT (2018)



FIGURE 5. PEDESTRIAN AND BICYCLE CRASHES IN THE STUDY AREA – DOWNTOWN





FIGURE 6. PEDESTRIAN AND BICYCLE CRASHES IN THE STUDY AREA - NORTH OF DOWNTOWN





Among eleven intersections analyzed on US-101, five pedestrian crashes occurred, two of which occurred at the intersection with OR-6 (3rd Street). Therefore, that intersection was found to have an excess proportion of pedestrian crashes, with a magnitude of 18 percent.

North of downtown, two pedestrian-involved crashes were recorded at the intersection of US-101 and Makinster Road. Two incidents were also recorded at US-101 and Wilson River Loop – one was a pedestrian-involved crash where a pedestrian was involved but was not struck, and the other was pedestrian crash where a pedestrian was struck. A bike crash was also recorded at US-101 and Makinster Road.

There is one segment along US-101 within the study area that is identified as being in the top 10% of the 2015 Safety Priority Index System (SPIS)⁴ rankings. The segment is approximately a 950-foot segment of US-101 (MP 64.48-64.66) centered around the intersection of US-101 and Wilson River Loop Road north of downtown. Along US-101, all the highway segments observed had crash rates that exceed the statewide average for 2011-2015 except for the north of downtown segment between the Hoquarton Slough and the northern City limits.

3.9 Ped Safety Issues

Although the pedestrian network is generally well-developed and connected within downtown Tillamook, several elements of the pedestrian system are in need of update or repair and pose safety issues. In some locations, crosswalks are faded and difficult to see and a high number of driveways and private accesses create a barrier to continuous, connected pedestrian facilities. In addition, pedestrian signalization is largely lacking throughout most of the City.

On US-101 north of Hoquarton Slough, marked crossings are few and infrequent, making it difficult for pedestrians to cross the road. There is a lack of mid-block crossings and the crossings that do exist are generally faded and lack signalization. Given that this section of US-101 is a faster moving 5-lane highway, the signalized intersection at Wilson River Loop is currently the safest location for pedestrians to cross US-101. Signalized intersections are generally considered safer crossing locations than unsignalized marked crossings since they are capable of stopping traffic for adequate change, crossing, and clearance intervals based on walking speed. Signalized intersections often also include pedestrian signal displays (WALK/DON'T WALK) or countdown displays, and can incorporate other physical elements to facilitate safe pedestrian crossing, such as minimized curb radii, shortened crossing distances, and accessible signal displays and curb ramps.

3.10 Summary

Based on the existing conditions in the study area – pedestrian volumes, crossing patterns, crashes, and posted vehicle speeds – the project team determined the locations and types of crossings needed. The existing conditions for each of the recommended crossings are summarized in Table 4, and the

⁴ The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while taking traffic volume into account. When a segment is ranked in the top 10% of the index, a crash analysis is typically warranted, and corrective actions are considered.



recommendations are further described in Table 5 below. There were no recorded pedestrian crashes at these intersections between 2011-2015.

TABLE 4. EXISTING CONDITIONS AT RECOMMENDED CROSSINGS

Intersection	Pedestrian Volumes		Crossing Patterns	Posted Vehicle Speed
	Peak Hour	Four Hour		
US-101 SB (Main Ave)/7 th Street	N/A	N/A	Anecdotal evidence suggests that 7 th Street is an important crossing; many students cross at this street to reach the schools and YMCA.	25 mph
US-101 NB (Pacific Ave)/7 th Street	N/A	N/A	Anecdotal evidence suggests that 7 th Street is an important crossing; many students cross at this street to reach the schools and YMCA.	25 mph
US-101 SB (Main Ave)/9 th Street	N/A	N/A	Anecdotal evidence suggests that 9 th Street is an important crossing; many students cross at this street to reach the schools and YMCA.	25 mph
US-101 NB (Pacific Ave)/9 th Street	N/A	N/A	Anecdotal evidence ⁵ suggests that 9 th Street is an important crossing; many students cross at this street to reach the schools and YMCA.	25 mph
US-101 SB (Main Ave)/11th Street	6	23	11 th Street is a designated bike route and is the southernmost east-west through route in the City	25 mph
US-101 NB (Pacific Ave)/11th Street	10	24	11 th Street is a designated bike route and is the southernmost east-west through route in the City. There are existing, unapproved, marked crosswalks at this location.	25 mph
Hadley Road at US-101	N/A	N/A	Anecdotal evidence suggests that Hadley is an important crossing to bridge a commercial area and reach recreation opportunities at	35 mph

⁵ There is a hotel on 9th Street between Main and Pacific Avenues that can generate a significant amount of pedestrian traffic, indicating a higher need for a marked crossing.



			Hadley Fields. This location is also one of the few legal crossing opportunities for 1000'-2000' on either side.	
US-101 near Makinster Road	N/A	N/A	There is an existing, unapproved, marked crosswalk at this location, which is also the northern-most crossing on US-101 within the City. The crossing currently serves a Goodwill shopping center and an Ashley Inn.	45 mph

4 Recommendations

4.1 Crossing Enhancements

Table 5 outlines the recommended crossing enhancements in the study area (US-101 Pacific and Main Avenues from 3rd Street to 12th Street). The locations of these recommended crossings are shown in Figures 7 and 8.

TABLE 4 RECOMMENDED CROSSING ENHANCEMENTS

Location	Type	Justification
7 th Street at US-101 SB Main and NB Pacific Streets	<ul style="list-style-type: none"> Marked (continental crossing) Advance crossing signage 	Community members indicated that many use this crossing to get to the YMCA and Liberty Elementary School
US-101 SB Main and NB Pacific Streets at 7 th Street	<ul style="list-style-type: none"> Marked (continental crossing) Advance crossing signage 	Community members indicated that many use this crossing to get to the YMCA and Liberty Elementary School
9 th Street at US-101 SB Main and NB Pacific Streets	<ul style="list-style-type: none"> Marked (continental crossing) Advance crossing signage 	Community members indicated that many use this crossing to get to the YMCA and Liberty Elementary School
US-101 SB Main and NB Pacific Streets at 9 th Street	<ul style="list-style-type: none"> Marked (continental crossing) Advance crossing signage 	Community members indicated that many use this crossing to get to the YMCA and Liberty Elementary School
11 th Street at US-101 SB Main Street	<ul style="list-style-type: none"> Marked (continental crossing) Advance crossing signage 	11 th Street is the last through east-west crossing on US-101 at the south end of town. In addition, 11 th Street is a designated bike route (Figure 9); it is expected that cyclists will use this crossing as well.



11 th Street at US-101 NB Pacific Street	<ul style="list-style-type: none"> • Marked (continental crossing) • Advance crossing signage Rectangular Rapid Flashing Beacon (RRFB) in northbound direction 	11 th Street is the last through east-west crossing on US-101 at the south end of town. In addition, 11 th Street is a designated bike route (Figure 9); it is expected that cyclists will use this crossing as well. RRFB is recommended due to anecdotal evidence of vehicle speeding on US-101 northbound at this location.
Hadley Road at US-101	<ul style="list-style-type: none"> • Advance crossing signage • Rectangular Rapid Flashing Beacon (RRFB) • Median island with pedestrian refuge • Pedestrian lighting improvements 	Hadley Road serves recreation opportunities at Hadley Fields and a commercial area just north of downtown. A crossing here makes a safe connection in an area that currently has none.
US-101 near Makinster Road	<ul style="list-style-type: none"> • Advance crossing signage • Rectangular Rapid Flashing Beacon (RRFB) 	This existing marked crossing is the northernmost crossing on US-101 within the City. It is adjacent to a Goodwill shopping center and an Ashley Inn. An RRFB is recommended given the high posted speed and because this is the first crossing travelling southbound into Tillamook. An RRFB would alert drivers of the presence of pedestrians in the City.

In addition to the crossing enhancements identified in Table 5, the project team recommends removing other east-west marked crossings at on Main and Pacific Avenues at 5th, 6th, 8th, and 10th Streets. These marked crossings are presently severely deteriorated. Use or need for this crossing was not identified by the PAC; importantly, too many marked crossings in a corridor reduces their effectiveness. By removing these crossings, the proposed marked crossings at 7th, 9th, and 11th Streets will be more effective at increasing driver compliance. These crossings are also not approved by ODOT and therefore not subject to crossing removal criteria.

4.2 Design Elements

In the downtown segment of US-101, signage is recommended for the crossings at 7th and 9th Streets. In addition to signage, a Rectangular Rapid Flashing Beacon (RRFB) is recommended at 11th Street and US-101/northbound Pacific Street to increase driver yielding behavior. 11th Street is located at the entrance to town and speeding often occurs as drivers enter the lower speed in-town section of US-101 from the higher speed section of US-101.

North of downtown, crossing improvements are recommended on US-101 at Hadley and Makinster Roads. Recommended improvements for Hadley include crossing signage, a median pedestrian refuge island, and an RRFB. Pedestrian lighting improvements are also recommended at this location as illumination is limited. Crossing improvements are also recommended at US-101 near Makinster Road, which currently features a faded marked crossing, a median refuge island, and bollards. Recommended



design elements at Makinster Road include crossing signage and an RRFB to enhance existing crossing facilities. The recommended design elements at Hadley and Makinster Roads will facilitate pedestrian and bicycle access to adjacent commercial and recreational areas, including Hadley Fields.

4.3 Adherence to ODOT Criteria

Tables 6 and 7 describe how the recommendations address ODOT criteria for marking crosswalks at uncontrolled intersections (see Table 1).

TABLE 6 ODOT CRITERIA FOR RECOMMENDED CROSSINGS AT 7TH, 9TH, AND 11TH STREETS

Criteria for Marking Crosswalks at Uncontrolled Intersections	Marked Crossings at 7 th and Main, Pacific	Marked Crossings at 9 th and Main, Pacific	Marked Crossings at 11 th and Main, Pacific
There is good visibility of the crosswalk from all directions, or it can be obtained. Stopping sight distance is a minimum.	Good visibility in all directions (see Figures 12 and 13).	Good visibility in all directions (see Figures 14 and 15).	Good visibility in all directions (see Figures 16 and 17).
There is no reasonable alternative crossing location.	Alternative crossing locations were considered in the corridor; these were selected based on established pedestrian usage.	Alternative crossing locations were considered in the corridor; these were selected based on established pedestrian usage.	Alternative crossing locations were considered in the corridor; these were selected based on established pedestrian usage. Additionally, 11th is the southernmost east-west street crossing location and no reasonable location exists further south.
There is established pedestrian usage in the corridor.	Feedback from TSP stakeholders indicates that many students use these crossing locations.	Feedback from TSP stakeholders indicates that many students use these crossing locations.	Feedback from TSP stakeholders indicates that many students use these crossing locations. Bicyclists also cross at this location. A pedestrian study indicated a total of 24 crossings on Pacific/11th during a 4-



			hour period from 2-6 PM (see Table 2).
Posted speeds should be 40 MPH or less.	Posted speed limit is 25 MPH	Posted speed limit is 25 MPH	Posted speed limit is 25 MPH
Traffic volumes should be 10,000 or fewer ADT. If above 10,000, a raised median island should be included.	ADT at both Main and Pacific exceed 10,000. A raised median island is not included due to both Main and Pacific both being one-way streets; there are additional physical and ROW constraints at each intersection.	ADT at both Main and Pacific exceed 10,000. A raised median island is not included due to both Main and Pacific both being one-way streets; there are additional physical and ROW constraints at each intersection.	ADT at both Main and Pacific exceed 10,000. A raised median island is not included due to both Main and Pacific both being one-way streets; there are additional physical and ROW constraints at each intersection. A RRFB is proposed to warn drivers entering the City of the presence of pedestrians.
On multi-lane highways, pedestrian crossing enhancements (curb extensions and/or pedestrian refuges) should be considered.	Main and Pacific (US-101) are two-lane, one-way streets.	Main and Pacific (US-101) are two-lane, one-way streets.	Main and Pacific (US-101) are two-lane, one-way streets.

**TABLE 7 ODOT CRITERIA FOR RECOMMENDED CROSSINGS AT HADLEY AND MAKINSTER ROADS**

Criteria for Marking Crosswalks at Uncontrolled Intersections	Crossing on US-101 at Hadley Road	Crossing on US-101 near Makinster Road
There is good visibility of the crosswalk from all directions, or it can be obtained. Stopping sight distance is a minimum.	Good visibility in all directions (See figures 10 and 11).	Good visibility in all directions (See figures 10 and 11).
There is no reasonable alternative crossing location.	This location was chosen to serve established pedestrian usage to access recreation opportunities at Hadley Fields and the commercial area on US-101. There are no other reasonable pedestrian crossings nearby.	A marked crossing with a pedestrian refuge already exists here, making it a strong location for an advanced pedestrian crossing in the northern part of the City. The next nearest crossing is a quarter mile to the south.
There is established pedestrian usage in the corridor.	Feedback from TSP stakeholders and ODOT indicates that many people use this crossing.	Feedback from ODOT indicates growing pedestrian usage at this location.
Posted speeds should be 40 MPH or less.	Posted speed limit is 35 MPH	Posted speed limit is 45 MPH ⁶
Traffic volumes should be 10,000 or fewer ADT. If above 10,000, a raised median island should be included.	ADT exceeds 10,000. A raised median island and RRFB are proposed to give crossing pedestrians a refuge and to warn drivers entering the City of the presence of pedestrians.	ADT exceeds 10,000. A raised median island already exists and shall be maintained. An RRFB is proposed to warn drivers entering the City of the presence of pedestrians.
On multi-lane highways, pedestrian crossing enhancements (curb extensions and/or pedestrian refuges) should be considered.	A raised median island is proposed to give crossing pedestrians a refuge.	A raised median island already exists and shall be maintained.

⁶ This location would require advanced pedestrian safety treatments such as a median refuge island and an RRFB for this to be an ODOT approved crossing location.



FIGURE 7. RECOMMENDED CROSSINGS, DOWNTOWN





FIGURE 8. RECOMMENDED CROSSINGS, NORTH OF DOWNTOWN

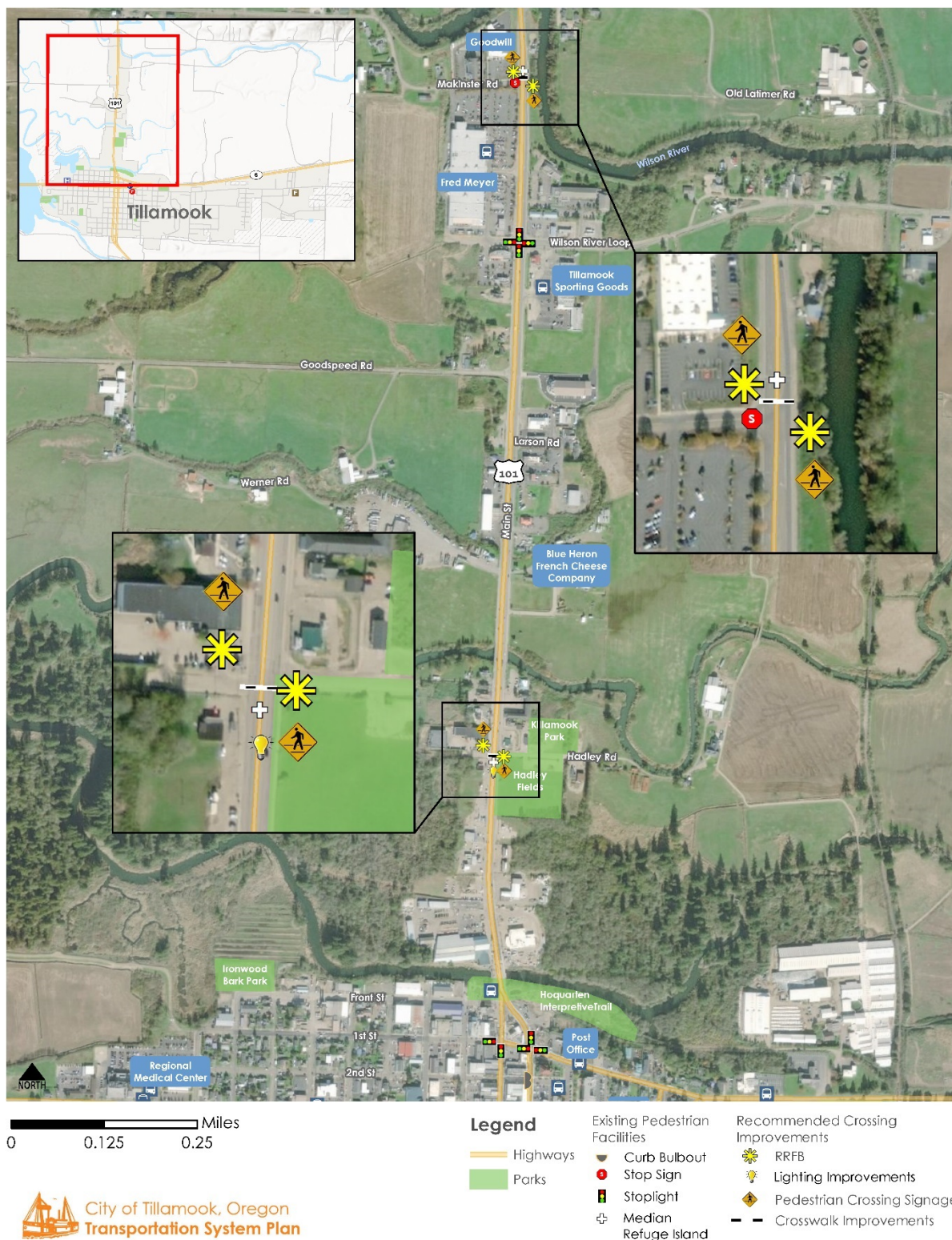
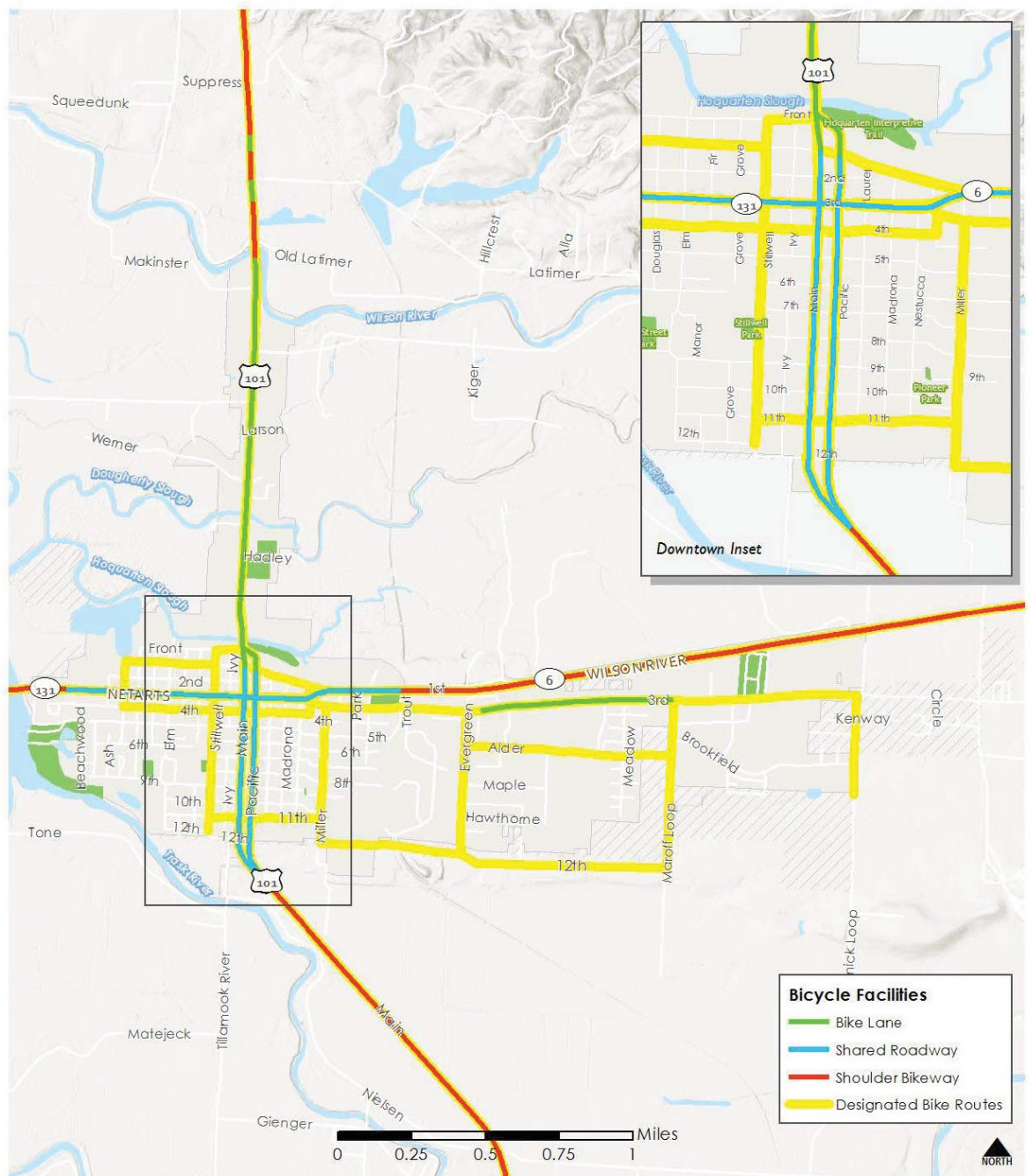




FIGURE 9. EXISTING BICYCLE FACILITIES AND DESIGNATED BICYCLE ROUTES



Existing Bicycle Facilities and Designated Bicycle Routes



City of Tillamook, Oregon
Transportation System Plan



FIGURE 10. INTERSECTION AT US-101 AND MAKINSTER ROAD



SOURCE: GOOGLE MAPS, MAY 2018

FIGURE 11. INTERSECTION AT US-101 AND HADLEY ROAD



SOURCE: GOOGLE MAPS, JUNE 2018



FIGURE 12. INTERSECTION AT 7TH STREET AND PACIFIC AVENUE



SOURCE: GOOGLE MAPS, AUGUST 2012

FIGURE 13. INTERSECTION AT 7TH STREET AND MAIN AVENUE



SOURCE: GOOGLE MAPS, AUGUST 2012



FIGURE 14. INTERSECTION AT 9TH STREET AND PACIFIC AVENUE



SOURCE: GOOGLE MAPS, AUGUST 2012

FIGURE 15. INTERSECTION AT 9TH STREET AND MAIN AVENUE



SOURCE: GOOGLE MAPS, AUGUST 2012



FIGURE 16. INTERSECTION AT 11TH STREET AND PACIFIC AVENUE



SOURCE: GOOGLE MAPS, AUGUST 2012

FIGURE 17. INTERSECTION AT 11TH STREET AND MAIN AVENUE



SOURCE: GOOGLE MAPS, AUGUST 2012



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