



# Technical Memo #7

Future Transportation Conditions & Needs  
December 12, 2021 – FINAL

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## Introduction

This technical memorandum (TM) documents the future conditions and anticipated needs of the transportation system in the Nehalem Bay region in 2040. The future conditions and needs presented in this memorandum are based on the technical analysis presented in *TM #5: Existing Conditions* and *TM #6: Future Traffic Forecasts*. This memorandum documents how the system would be expected to operate with only funded improvements in place if growth continues to occur within the region.

To align the outcomes of the Transportation System Plan (TSP) with the vision for each City and the region, the needs described below were identified based on the goals documented in *TM #4: Goals, Objectives, and Evaluation Criteria*. By using the goals as a starting point to identify needs and deficiencies in the current system, it will ensure that the list of solutions identified not only addresses deficiencies but also moves the region towards a transportation system that provides safe connections for all users and balances the needs of residents with regional travel.

## Nehalem Bay in 2040

Analysis of future transportation conditions in Nehalem Bay depends on the forecasted growth in the region. As land use and the population grows, additional pressure will be put on the transportation network to accommodate this new growth. The pattern of growth can also change transportation patterns and the need for new infrastructure – for example, a new housing development in an otherwise undeveloped area might prompt the need for additional roads, sidewalks, or bicycle facilities that aren't necessary under current conditions. Based on a review of the State Transportation Improvement Program and local Capital Improvement Programs (CIPs), there are no funded transportation projects in the Nehalem Bay Region.

### Expected Growth

As documented in *TM #6: Future Traffic Forecasts*, all three cities are expected to grow faster than the average for Tillamook County between now and 2040. While local population growth will contribute to an increase in demand, regional growth will contribute to growth on U.S. 101, a part of the transportation system in the region. Between now and 2040, the Oregon Department of Transportation (ODOT) expects traffic volume on U.S. 101 to grow by between 0.1 and 1.4 percent per year.

Future conditions and needs resulting from continued growth are identified by mode in the following sections.

## Roadway

Future conditions and needs for the roadway system are focused on addressing locations where future growth will exceed available capacity or result in poor operations and locations where a safety concern has been identified.

### Traffic forecasts

Average traffic volumes on U.S. 101 through the study area are expected to grow between 0.1 and 1.4 percent from 2018 to 2039. This growth roughly coincides with expected population growth in Nehalem Bay, which ranges from 0.8% in Wheeler to 1.5% in Manzanita between 2017 and 2035. The least amount of growth on U.S. 101 is expected at the west city limits of Nehalem, while the most amount of growth is expected 0.02 miles north of Manzanita Avenue. However, traffic volumes during peak tourist seasons may grow at a higher rate than the average expected traffic growth on U.S. 101 through the study area.

### LOS and V/C

None of the roadway segments in the study area exceed the v/c targets as set by the Oregon Highway Plan. U.S. 101 north of Tohls Street had the highest v/c ratio of all roadway segments in the study area with a v/c ratio of 0.51. The v/c ratio target for this roadway segment is 0.85. Therefore, existing roadway segments are expected to have adequate capacity for future traffic growth.

The two intersections analyzed in this study, U.S. 101 and 7th Street (Nehalem) and U.S. 101 and Hemlock Street (Wheeler), are expected to operate at LOS C in 2040. These intersections are expected to perform worse during peak tourist seasons due to increased delay associated with unfamiliar drivers and an increase in pedestrian activity.

### ODOT Blueprint for Urban Design

The Blueprint for Urban Design (BUD), published by ODOT in 2020, is a document meant to supplement the ODOT Highway Design Manual (HDM) for state system projects in urban contexts. Therefore, the BUD is relevant to segments of U.S. 101 within the city limits of Manzanita, Nehalem, and Wheeler.

Design guidance from the BUD varies by surrounding land-use contexts and roadway function. **Table 1** summarizes existing BUD contexts for different roadway segments of U.S. 101 through the study area.

**Table 1. BUD Contexts for Roadway Segments of U.S. 101**

Segment	BUD Context	Defining Roadway and Land-Use Characteristics	Highest Priority Modes
Nehalem Road to Pacific Heights Road	Commercial Corridor	<ul style="list-style-type: none"> <li>• Two-lanes, 40 mph speed limit</li> <li>• Commercial, industrial, and institutional uses</li> <li>• Medium to large setbacks</li> <li>• Off-street parking</li> <li>• Large blocks, not well defined</li> </ul>	Motorist Freight Transit
Pacific Heights Road to 10 <sup>th</sup> Street	Suburban Fringe	<ul style="list-style-type: none"> <li>• Two- to three-lanes, 40 mph speed limit</li> <li>• Varied, interspersed development</li> <li>• Varied setbacks</li> <li>• Varied parking types</li> <li>• Large blocks, no well defined</li> </ul>	Motorist Freight
10 <sup>th</sup> Street to Nehalem Point Drive	Rural Community	<ul style="list-style-type: none"> <li>• Two-lanes, 25 mph speed limit</li> <li>• Residential, commercial, institutional, and parks uses</li> <li>• Shallow setbacks</li> <li>• Parallel on-street parking</li> <li>• Small to medium blocks</li> </ul>	Bicyclist Pedestrian
Nehalem Point Drive to Hemlock Drive	N/A	<ul style="list-style-type: none"> <li>• Roadway segment is not in an urban context</li> </ul>	N/A
Hemlock Drive to Gregory Street	Rural Community	<ul style="list-style-type: none"> <li>• Two-lanes, 25 mph speed limit</li> <li>• Residential, commercial, institutional, and parks uses</li> <li>• Shallow setbacks</li> <li>• Angled on-street parking</li> <li>• Small to medium blocks</li> </ul>	Bicyclist Pedestrian

A complete urban context matrix can be found in Table 2-2 in the BUD. While the BUD provides design recommendations based on a roadway’s defined context, there is still design flexibility from both the BUD and HDM based on project specific land-uses, community-based needs, and safety considerations. Additionally, the BUD does not recommend changing facility speed limits given that ODOT has clear policy guidance related to posted speed selection. However, the following is generally expected along corridors with the following BUD contexts:

**Commercial Corridor:**

- Balanced access for bicycles, pedestrians, motor vehicles, freight, and transit
- Vehicle speeds between 30 and 35 mph
- Medians to facilitate access (e.g. center turn lanes)
- Bicycle and pedestrian facilities to be separated from travel lanes by a buffer

### Suburban Fringe:

- Design should consider the expected future context of the roadway
- Vehicle speeds between 35 and 40 mph
- Bicycle and pedestrian facilities to be separated from travel lanes by a buffer

### Rural Community:

- Designed to accommodate a wide variety of modes
- Vehicle speeds between 25 and 35 mph
- Gateway intersections or other streetscaping to inform drivers that they are entering a town center
- Frequent pedestrian crossings
- Bicycle and pedestrian facilities to reflect the needs of the community

### Needs

Based on the expected growth in traffic along U.S. 101 through the study area, there is no need identified to increase capacity along U.S. 101. While demand may not exceed capacity at the U.S. 101 and 7<sup>th</sup> Street intersection in the future, the unique configuration resulting in an increase in delay, specifically during times when regional travel is high, and safety concerns at this intersection, results in the identification of improvements at this intersection as a need. Improvements at this intersection should address two specific needs:

- **Creating a more standard intersection control.** Delay at this intersection is a result of unfamiliar drivers yielding or stopping on free movements (all northbound movements and the eastbound right-turn).
- **Improving safety for pedestrians crossing at the intersection.** There are a high number of pedestrians crossing the south leg of the intersection, which conflict with all the free movements at the intersection.

Segments of U.S. 101 do not meet the Oregon Highway Plan's spacing standards within the city limits of Manzanita, Nehalem, and Wheeler. Future projects should seek opportunities to reduce driveway densities along those roadway segments.

Additionally, two bridges along U.S. 101 between Manzanita and Nehalem have low sufficiency ratings and are eligible for federal funding. Federal funding may be used for replacement or rehabilitation of these bridges.

## Safety

Crash data from 2014 to 2018 was analyzed to identify locations where safety improvements may be needed. Based on the crash data, crashes attributed to speeding and at intersections occur at a higher rate than the statewide average. **Figure 1** through **Figure 4** on the following pages summarize crash profiles and specific needs within each of the three Cities and surrounding areas within the Urban Growth Boundary (UGB). As shown on the figures, U.S. 101 is the facility in the region with the highest number of crashes according to ODOT crash records. Many of these crashes can be attributed to high vehicle speeds in poor weather conditions.

### Needs

Improvements needed to address safety issues within the region include:

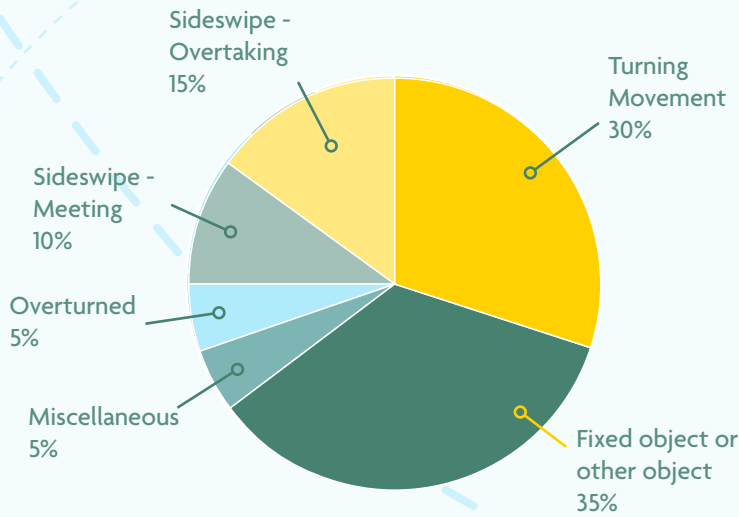
- Enhanced curve delineation
- Traffic calming to lower vehicle speeds
- High visibility crosswalks to improve visibility at marked crossings
- Sidewalk improvements to address existing deficiencies and ensure that facilities are consistent with the Americans with Disabilities Act (ADA) standards

# Manzanita

## Crash Countermeasures



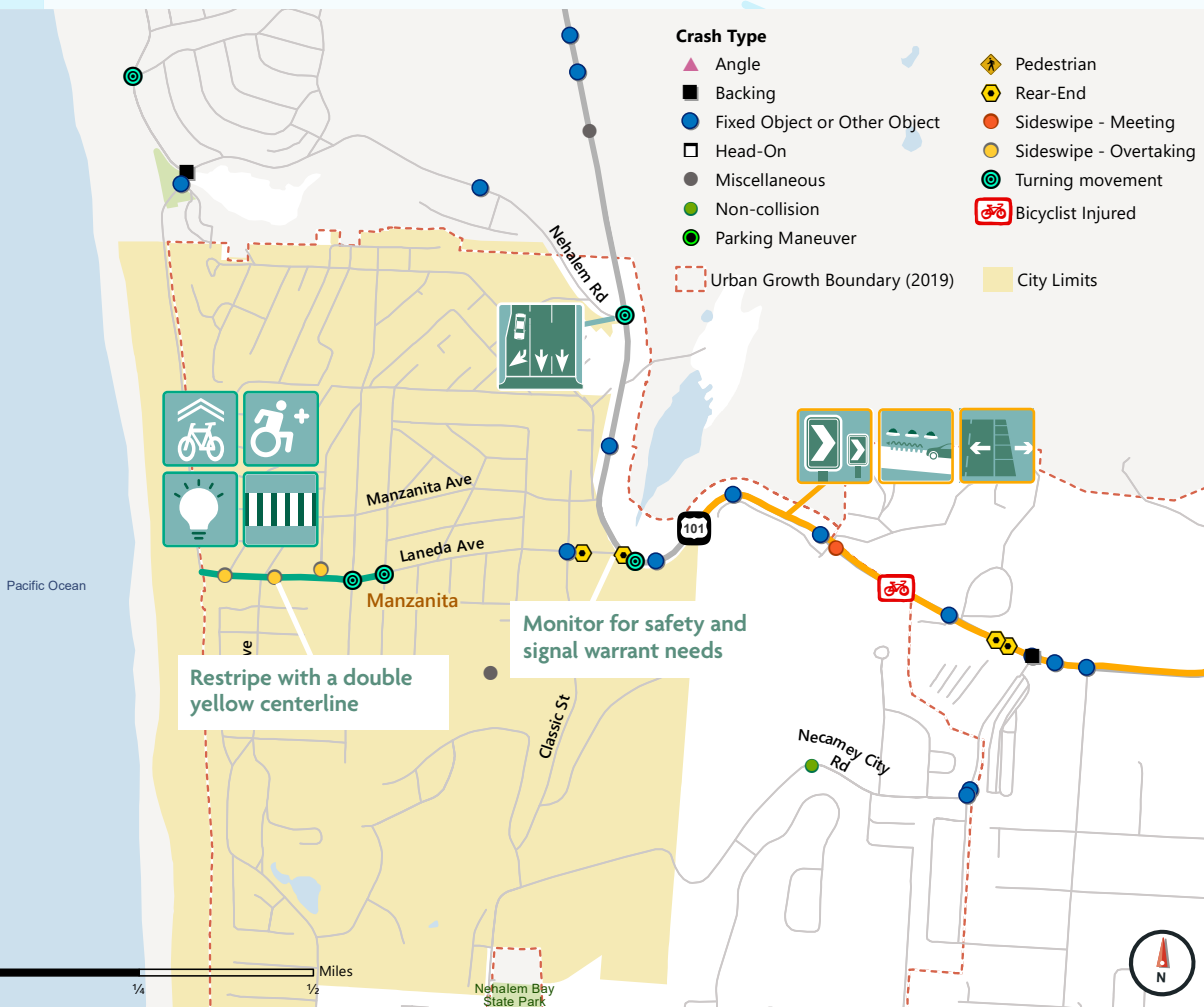
### Crash Profile



★ **One collision** with a *bicyclist* on US 101 east of Manzanita.

★ Most common cause of crashes: **Too fast for conditions, improper driving, and did not yield right of way**

★ **43%** of crashes occurred at an *intersection or driveway* and **26%** at a *horizontal curve*



### Countermeasures

- Widen paved shoulder where less than 5 ft.
- Add rumble strips  
Install safety edge
- Enhanced curve delineation - pavement markings, delineators, or chevrons
- Add southbound right turn pocket
- Add pedestrian scale lighting
- High visibility crosswalks
- ADA improvements to standards
- Bike sharrows

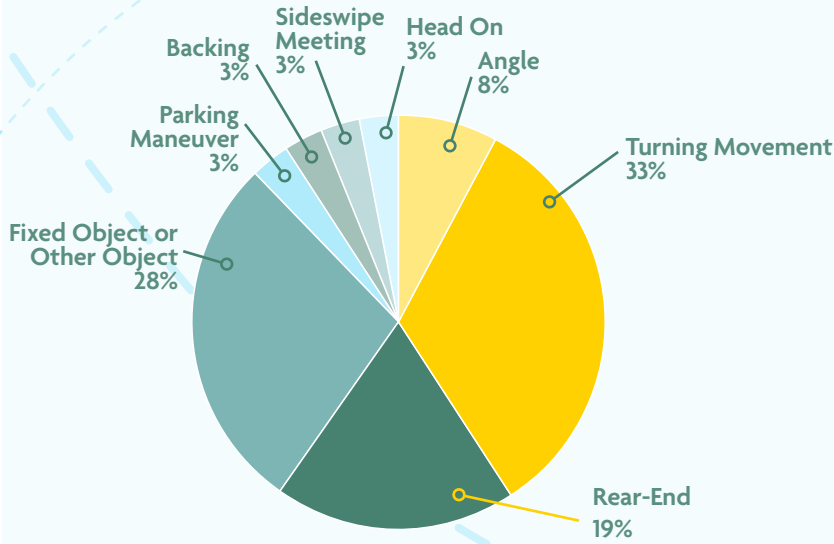
Further study is needed before installation of any countermeasures indicated here. These are general recommendations only.

# Nehalem

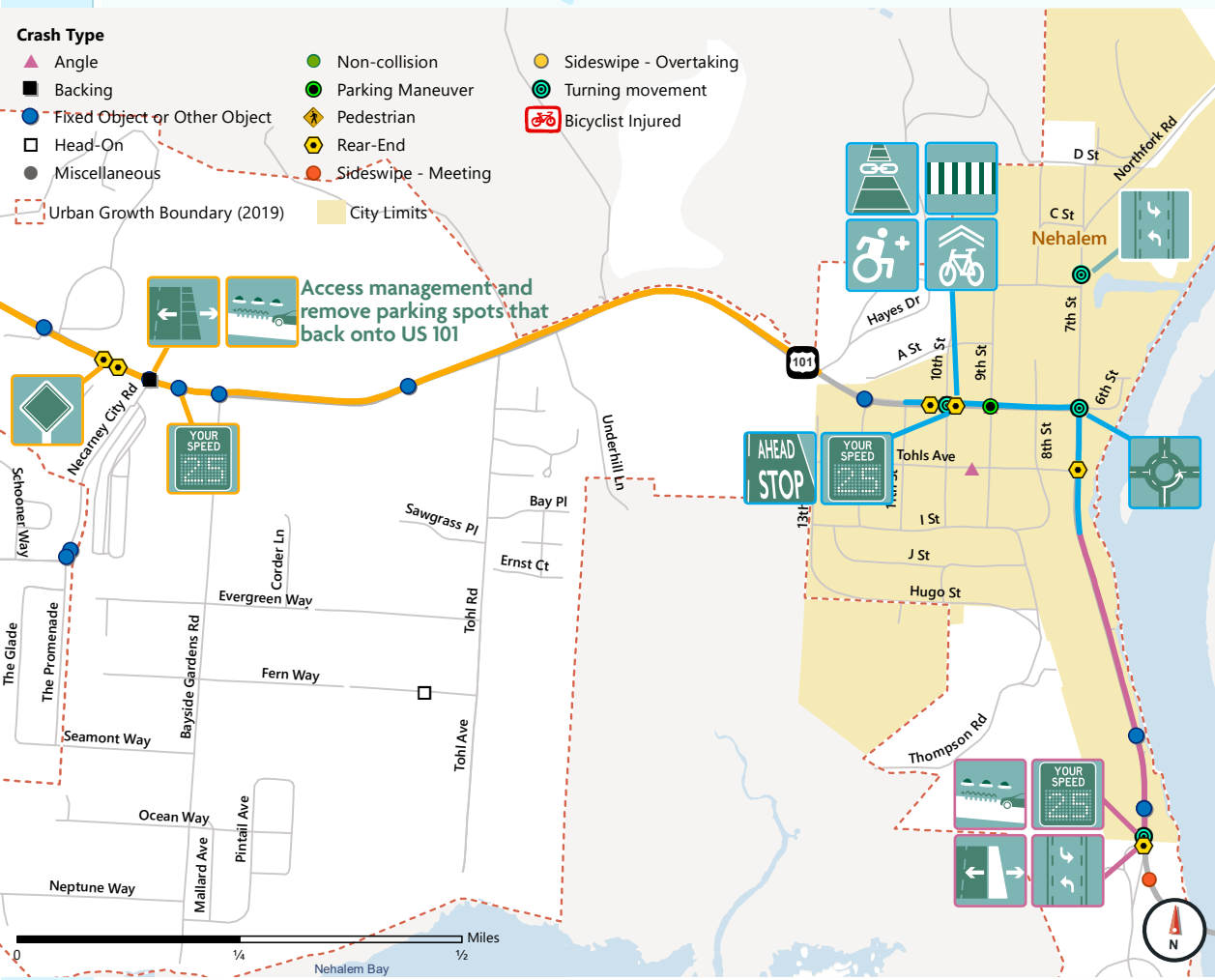
## Crash Countermeasures



### Crash Profile



- Most common cause of crashes: **did not yield right-of-way.**
- 63%** of crashes in the city limits and **73%** outside city limits occurred at an intersection or driveway.
- Most common crash intersections are **10th Street, 9th Street, and 7th Street.**



### Countermeasures

	Widen paved shoulder
	Add rumble strips
	Install a Safety Edge
	Flashing beacons at intersection approaches
	Stop Ahead or SLOW markings
	Add two-way left turn lane
	Change intersection control (roundabout, all way stop, signal)
	High visibility crosswalk
	Identify locations for speed feedback sign
	Speed Study

- ADA improvements to standards
- Bike sharrows
- Complete sidewalk gaps
- Painted shoulders

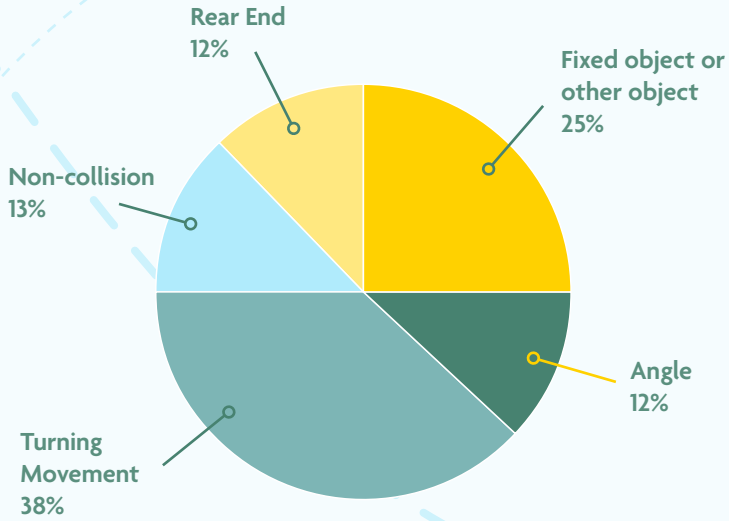
Further study is needed before installation of any countermeasures indicated here. These are general recommendations only.



# Wheeler

## Crash Countermeasures

### Crash Profile



Two turning crashes occurred near the intersection of US 101 and Rector Street.

Three crashes were due to improper turning, the most common crash cause.

#### Crash Type

- ▲ Angle
- Backing
- Fixed Object or Other Object
- Head-On
- Miscellaneous
- Non-collision
- Parking Maneuver
- ◆ Pedestrian
- ◆ Rear-End
- Sideswipe - Meeting
- Sideswipe - Overtaking
- Turning movement
- 🚲 Bicyclist Injured
- 🚶 City Limits
- 🏠 Urban Growth Boundary (2019)

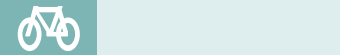


### Countermeasures

Identify locations for speed feedback signs

Add pedestrian scale lighting

High visibility crosswalks

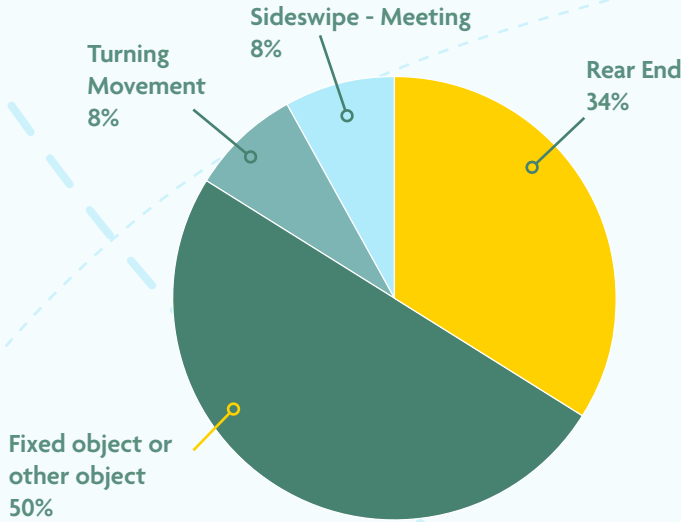


Monitor the intersection of US 101 and Rector St. for the need for an all-way stop

# Regional Nehalem Bay Crash Countermeasures

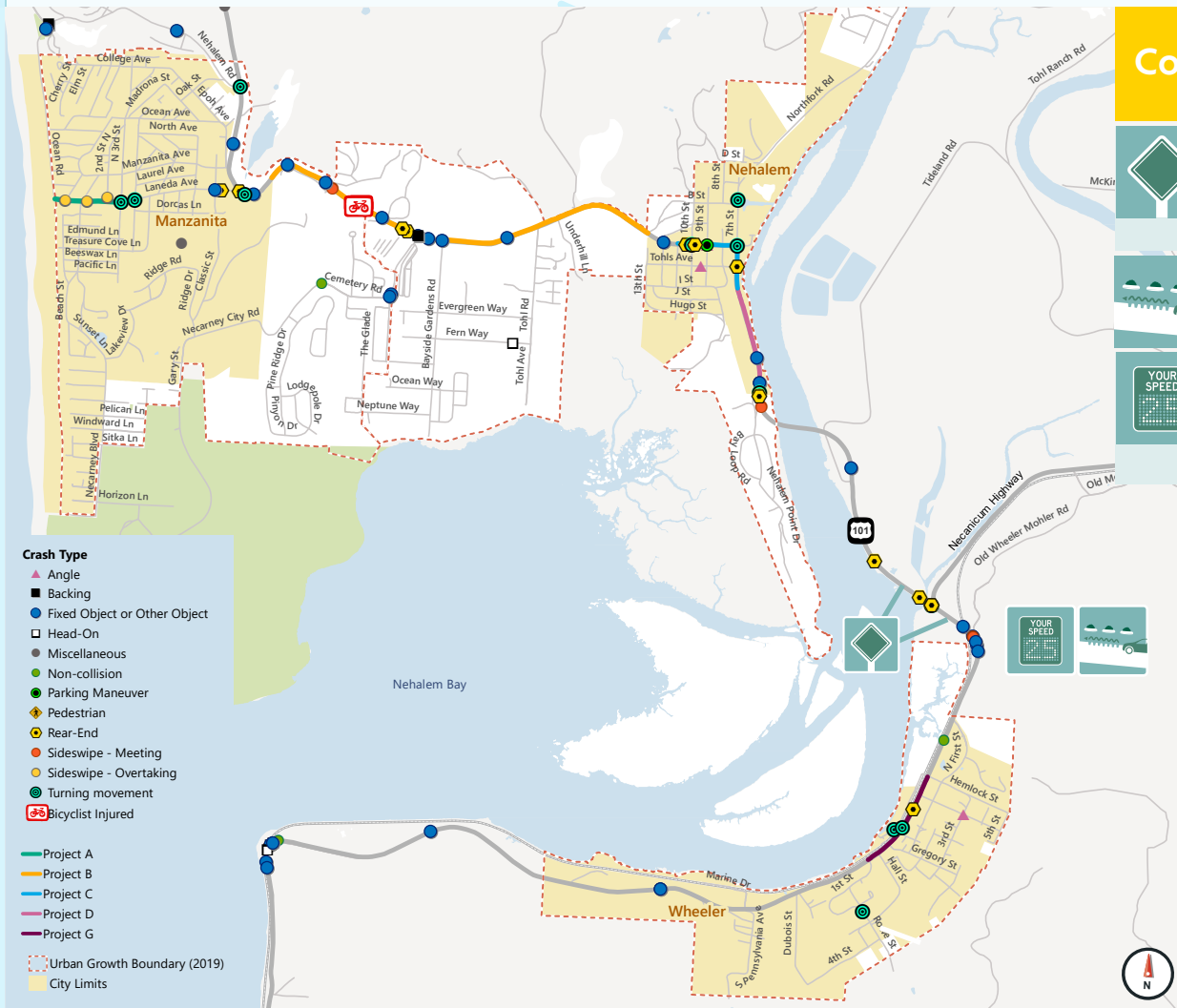


## Crash Profile



Five crashes on this stretch of US 101 involved drivers **driving too fast** for the conditions

Four crashes occurred near the junction with OR 53 and **five** occurred on the curve south of the junction.



## Countermeasures

Provide additional advanced signage for junction

Rumble Strips and extend the guardrail

Install dynamic speed feedback sign for curves

Review existing pockets at the SR 53 & US 101 intersection and improve to MUTCD standards

- Crash Type**
- ▲ Angle
  - Backing
  - Fixed Object or Other Object
  - Head-On
  - Miscellaneous
  - Non-collision
  - Parking Maneuver
  - ◆ Pedestrian
  - Rear-End
  - Sideswipe - Meeting
  - Sideswipe - Overtaking
  - Turning movement
  - 🚲 Bicyclist Injured

- Project A
- Project B
- Project C
- Project D
- Project G
- Urban Growth Boundary (2019)
- City Limits

Further study is needed before installation of any countermeasures indicated here. These are general recommendations only.

## Transit Needs

Transit in the region is provided by NW Connector Route 3, which runs daily Northbound and Southbound through Nehalem Bay. Frequency ranges between two and three hours with five scheduled stops through Nehalem Bay. Increased service for Route 3 should be considered to increase the utility of this regional transit connection. Additionally, a circulator shuttle between the communities of Manzanita, Nehalem, and Wheeler should be considered to compliment service from Route 3.

## Bicycle Needs

The only marked bicycle facility in Nehalem Bay exists in Manzanita as a striped bicycle lane on the east side of Carmel Avenue between Laneda Avenue and Horizon Lane. More pavement markings or signage indicating bicycle routes are needed to help facilitate both local and tourist bicycle activity. Additionally, bicycle markings and signage help alert drivers of the potential for bicyclists on the roadway, increasing safety and comfort for roadway users.

U.S. 101 is the only direct roadway connecting the communities of Manzanita, Nehalem, and Wheeler. The bicycle facilities along U.S. 101 between these communities consists of paved shoulders. Consistent and marked bicycle facilities are suggested to improve bicycle connectivity between communities.

U.S. 101 through the city limits of Manzanita, Nehalem, and Wheeler is also difficult to cross for bicyclists when traffic is heavy. Traffic calming treatments within city limits are needed to increase bicycle connectivity across U.S. 101.

## Pedestrian Needs

While pedestrian facilities are present and adequate around retail and active storefront developments in Nehalem Bay, gaps in pedestrian infrastructure exist along main roads. Infrastructure gaps should be prioritized to increase connectivity for pedestrians throughout the region. Additionally, U.S. 101 through the city limits of Manzanita, Nehalem, and Wheeler are difficult to cross for pedestrians. Marked crosswalks and traffic calming treatments within city limits are needed to increase pedestrian connectivity across U.S. 101.

To facilitate safe walking conditions for school children, pedestrian facilities should be constructed in the vicinity of Nehalem Elementary School. There are currently no pedestrian facilities in this area.

## **Air, Marine, Rail, Pipeline Needs**

No future needs were identified for air, marine, rail, or pipeline infrastructure in the Nehalem Bay Region.

## **Tsunami and Hazard Evacuation Needs**

The Emergency Volunteer Corps of Nehalem Bay (EVCNB) has developed a Tsunami Inundation Zone Map, which includes recommended evacuation routes. Over the coming years, the region should continue to look for opportunities to integrate emergency preparedness in regional coordination and identify ways to increase the number of transportation routes that may be accessible in the event of an emergency through Intelligent Transportation Systems (ITS).