City of Newport

TRANSPORTATION SYSTEM PLAN

AUGUST 2022

NEWPORT
OREGON

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CONTENTS

VOLUME 2: APPENDIX

LIST OF FIGURES

LIST OF TABLES

Chapter 1: Executive Summary

INTRODUCTION

The City of Newport initiated this update to their Transportation System Plan (TSP) to address a range of challenges and opportunities that emerged since the 2012 Newport TSP. In general, the TSP update process was designed to comply with the State of Oregon guidance and requirements per the Transportation Planning Rule (OAR 660-012-0015), which includes a public outreach process, an evaluation of current and future transportation needs, and a strategic and reasonable funding program (see Figure 5, Chapter 2 for more details).

Critical Community Issues were developed specifically for Newport, under the guidance of city leaders and a committee of key community stakeholders, referred to as the Project Advisory Committee. This TSP update focused on the following critical community issues:

- Developing desired streetscape, urban form, and roadway alignment for downtown commercial core to spur redevelopment.
- Developing transportation enhancements for the Agate Beach neighborhood that are sensitive to local geologic conditions.
- Updating the TSP capital projects and planning level estimates for near- and long-term system investment priorities.
- Clarifying whether the US 101 highway alignment may change as a part of the future replacement of Yaquina Bay Bridge.
- Evaluating the viability and efficiency of NE Harney Street extension as north-south alternative to US 101.
- Developing an integrated multi-use bike and pedestrian network.
- Developing neighborhood traffic calming measures and pedestrian safety needs.
- Identifying transit needs of the community.
- Identifying the city’s role in supporting emerging transportation technology.
- Refining street cross-sections requirements to provide options that address constraints.
- Refining infill frontage improvement requirements that better balance cost and community needs.

The outcomes and recommendations are presented in the following chapters. Technical background information that formed the basis for many of the recommendations are available in a separate volume (see Newport TSP, Volume 2). The overall structure of the is summarized below.

Chapter 1: Executive Summary is a high-level overview of the TSP and its findings.

Chapter 2: Transportation System Context introduces the local history of Newport and its transportation system. It defines the planning goals and objectives and lays out the challenges and opportunities that the city addressed through this TSP update. The stated goals and objectives are the basis for choosing preferred transportation projects (see Chapter 5).

Chapter 3: Newport Today & Tomorrow presents how the city is planning to grow through 2040, and how historical travel patterns could change as a result. Each component of the local transportation system was reviewed and evaluated to consider how effectively it performs its intended objectives, and to identify gaps or limitations that should be addressed. The outcomes of these evaluations provide a list of transportation system needs around the city that will be examined to develop solutions (see Chapter 5).

Chapter 4: System Design & Management Principles defines the preferred routes and hierarchy of the system as it relates to freight, motor vehicles, transit, bicycling, and walking. In addition, the facility standards show specific design requirements regarding the overall dimensions, amenities, and provisions for individual travel modes. These facility cross-sections are used later in the process (see Chapter 6) to prepare initial estimate construction costs, and right-of-way requirements.

Chapter 5: Project Development & Evaluation presents the process used to identify investments that best align with the goals and objectives, which involved a combination of technical analysis as well as feedback from the project stakeholders and the public.

Chapter 6: Projects and Priorities lists the outcomes of the solution development and scoring process from Chapter 5. Projects are listed in four groups, according to funding priorities.

Chapter 7: Implementation & On-Going Strategies lays out the steps ahead to act on the TSP update, and to address on-going community issues related to transportation that are not specifically resolved by the TSP process and recommendations.

TRANSPORTATION SYSTEM CONTEXT (CHAPTER 2)

The City of Newport incorporated in 1882, and the 1910 census reported about 700 residents. Over the past century, the city has grown to just over 10,000 permanent residents today. The summertime population peaks at 25,000 because of the seasonal changes in tourist, employment, visitor, and recreational activities. As a popular Oregon Coast community and active seaport, Newport experiences its highest transportation demands during summer months when tourism and recreation are at their peak, whereas travel activity during the winter months is much lower. For example, the daily traffic counts on US 101 near City Hall drop by about 40 percent between July and January. This planning process recognizes how these seasonal swings in travel activity effect the community.

KEY TRANSPORTATION OPPORTUNITIES AND CHALLENGES

Newport faces the challenge of accommodating growth while maintaining acceptable service levels on its transportation network. Some of the key opportunities and challenges noted for this TSP update are listed below:

- **US 101 and US 20** form the primary transportation network and carry most the motor vehicle traffic. Outside of the downtown core area, the geographic constraints of the ocean coast, Yaquina Bay and local hillsides have fostered a strong reliance on the state highway system both for local travel and regional service to nearby communities. These highways were built with limited walking and bicycling amenities which continues to be a challenge for residents, visitors and tourists who are traveling outside of their motor vehicles.
- **Downtown** is where many of the properties are underutilized or in economic distress with vacant storefronts and aging, poorly maintained buildings. The City has an opportunity to leverage its urban renewal district to generate funding to revitalize the downtown area, which is also referred to as the commercial core area, along with upgrading the transportation system to catalyze economic development and provide infrastructure needed to support additional density.
- **Yaquina Bay Bridge** is an integral part of Newport as well as an historic icon on Oregon's coast highway system. Since its opening in 1936, the bridge has been the only transportation link across Yaquina Bay to South Beach. The Oregon Department of Transportation (ODOT) has been working to extend the functional life of the bridge, but expects that it will eventually be replaced. The timing for its replacement is uncertain, however, ODOT has indicated that its current location would be the preferred option to minimize environmental, engineering and community impacts.
- **Natural Hazards** considered in this TSP include the potential tsunami events following earthquakes and mitigating for unstable soils and ocean bluff erosion.

REFINED GOALS AND OBJECTIVES

The TSP goals and objectives define how the community's vision will shape the design, construction, operation, and management of the transportation system. This **2022 TSP update** reorganized the 2012 TSP structure and added several new goals. The plan framework now better supports performance-based planning. The new goals for the Newport TSP are listed below. For more details about the full policy framework, please refer to *Setting the Direction for the Plan* in Chapter 2.

- **Goal 1: Safety** – Improve the safety of all users of the system for all modes of travel.
- **Goal 2: Mobility** – Promote efficient travel that provides access to goods, services, and employment to meet the daily needs of all users, as well as to local and regional major activity centers.
- **Goal 3: Active Transportation** – Complete safe, convenient and comfortable networks of facilities that make walking and biking an attractive choice by people of all ages and abilities.
- **Goal 4: Grow the Economy** – Develop a transportation system that facilitates economic activity and draws business to the area.
- **Goal 5: Environment** – Minimize environmental impacts on natural resources and encourage lower polluting transportation alternatives.
- **Goal 6: Support Healthy Living** – Support options for exercise and healthy lifestyles to enhance the quality of life.
- **Goal 7: Prepare for Change** – Ensure that the choices being made today make sense at a time when Newport is growing, and the transportation industry is rapidly changing.
- **Goal 8: Fiscal Responsibility** – Sustain an economically viable transportation system.
- **Goal 9: Work with Regional Partners** – Partner with other jurisdictions to plan and fund projects that better connect Newport with the region.

In addition to the goals outlined above, a set of supplemental strategies and guidelines were developed to address specific issues of concern within the Commercial Core and the Agate Beach areas of the City.

DECISION-MAKING STRUCTURE

The decision-making structure for this TSP was developed to establish clear roles and responsibilities throughout the project. The primary elements of that structure included:

- A Project Management Team (PMT) that included city staff, ODOT staff and the consultants.
- A Project Advisory Committee (PAC) that included local committee, neighborhood, and business representatives, emergency service providers, and agency staff members from the City of Newport, Lincoln County, and the ODOT.
- The City Council and Planning Commission for Newport were briefed throughout the process.
- The City Council made all final decisions pertaining to this TSP. The PMT made recommendations to the Planning Commission and City Council based on technical analysis and community input.

PUBLIC AND STAKEHOLDER ENGAGEMENT

Public outreach was conducted between November 2020 and August 2021 to share information about the TSP project and community members, stakeholders, and other interested parties were invited to share their ideas and feedback. The project team adapted to the COVID-19 pandemic to provide several engagement opportunities to enable community members to safely participate and provide meaningful input. Approximately 970 people were engaged through a variety of outreach opportunities.

Overall, the respondents wanted a focus on the safety and circulation for the walking, biking, and transit modes of travel. A complete summary of the outreach efforts can be found in Appendix N, Newport TSP Outreach Summary.

Common themes heard from public engagement included the following:

- Pedestrian and bicyclist safety throughout the city.
- Increased bus/transit/shuttle options.
- Interest in improving traffic flow and reducing congestion, for through travelers and local users.
- Parking improvements, especially in the downtown area.
- Traffic speeding enforcement.
- Preserve/rebuild the Yaquina Bay Bridge in the same location.
- Strong support for emerging technology such as electric vehicle (EV) charging stations, parking solutions and solar power.

NEWPORT TODAY AND TOMORROW (CHAPTER 3)

A comprehensive assessment was made of the travel patterns and transportation system performance within Newport as it operates today, and how that is expected to change with planned growth through 2040. To make the future forecast, the designated growth areas within the city were reviewed to determine how travel activity and patterns would change based on historical demographic and travel data. The future year travel forecast was made for summertime conditions, and it was used to evaluate how effectively proposed roadway solutions would operate.

The findings of this technical analysis for all travel modes combined with input from the public engagement process formed a master list of system needs for the community. Later in the update process (see Chapters 5 and 6), the past TSP projects identified from the 2012 TSP were refined and amended, as needed, to fully address the latest understanding of the community's transportation needs.

For further technical background information, refer to Technical Memorandums *#5 Existing Transportation Conditions*, *#6 Future Traffic Forecast* and *#7 Future Transportation Conditions and Needs* that are contained in Volume 2.

LAND USE AND TRANSPORTATION DEMAND GROWTH

The city's present urban growth boundary (UGB) and adopted land use zoning maps indicate the location and type of development that is expected to occur in Newport. In addition, citywide population forecasts are coordinated with a statewide effort that is led by Portland State University. By 2040, the growth in households and employment for Newport are illustrated in Figures 11 through 16 in Chapter 3. In summary, they include the following planned growth:

- **Households** - About 1,000 more homes are expected throughout the city, with the highest concentrations in the recent UGB addition near NE 36th Street and NE Harney Street, and the emerging neighborhood along SE 40th Street near the Oregon Coast Community College. Many other neighborhoods expect modest residential in-fill development.
- **Population** – About 2,400 more permanent residents are expected to reside in these new homes. In addition, visiting households during peak seasons are forecasted to increase by about 210 more than today (see Figure 19, Chapter 3).
- **Summer Employment** - About 2,700 more jobs are expected during the summer. Overall job growth will be highest in the South Beach area, especially along Marine Science Drive, and south of 40th Street, and in the very north end of the city near 73rd Street.

This combination of new housing, residents and jobs is expected to increase citywide vehicle trips by about 27% year-round by 2040.

MOTOR VEHICLE SYSTEM PERFORMANCE ISSUES

Based on technical evaluation and feedback from the community, the following operational, safety and maintenance issues were identified for the Newport motor vehicle system. ODOT has quantitative performance targets for its highways based on traffic delays, which were applied to determine if conditions were acceptable or not. A total of 20 intersections were selected for the operational analysis review.

- Six of the intersections on US 101 are expected to have major delays for motor vehicle traffic. This includes three locations that are controlled by traffic signals (at NE 52nd Street, US 20, and Hurbert Street) and three stop controlled intersections (at NE 73rd Street, Oceanview Drive, and Angle Street).
- Many other intersections along US 101 that were not specifically analyzed are expected to have severe delays during peak hours for traffic intending to turn left onto the highway. Several neighborhoods derive their only access from US 101, such as NE San-Bay-O Circle, NW 73rd Court and NW Wade Way/Cherokee Lane
- Two of the US 20 intersections are expected to have major delays including SE Benton Street (stop sign controlled on the side street) and NE Harney Street-SE Moore Drive (traffic signal control).
- The US 20/NE Harney Street-SE Moore Drive intersection was also cited by public feedback as being problematic for serving school related traffic before/after school sessions, and for major events at the Lincoln County fairgrounds.
- Other community safety concerns included the lane merging on southbound US 101 approaching Yaquina Bay Bridge, and the irregular access spacing on US 101 near the Newport Theater.

- Three local bridges were identified as being structurally deficient including US 101 over Big Creek, the Yaquina Bay Bridge, and on Big Creek Road over Big Creek.
- In addition to its weight limited condition, the vehicle traffic using the Yaquina Bay Bridge is expected to grow and it will eventually exceed the carrying capacity.

WALKING AND BICYCLING SYSTEM PERFORMANCE

Walking is an important part of local travel options, both within neighborhoods and parks as well as along and across major roadways. Provision of safe and convenient walking options can help the city move towards a complete multimodal transportation system. Today Newport has 33 miles of sidewalks, although about 70 percent of city streets lack sidewalks on at least one side.

Bicycling is common along US 101, which is part of the designated Oregon Coast Bike Route. Cyclists generally ride on the wide paved shoulders on US 101, since there are very limited designated bike lanes on the highway. Off highway, there is about 10 miles of shared-use pathways or trails available, but generally cyclists are required to share the roadway with vehicles. For both walking and bicycling system, a Level of Traffic Stress (LTS) score was determined that represents the user’s experience on that route.

Based on technical evaluation, field observations, and public feedback, the following walking and bicycling issues were identified:

- For walking travelers, about 25 percent of state highway and city collector street blocks were rated in the low to moderate LTS range, which is generally comfortable for the average traveler.
- For bicyclists, about 15 percent of state highways and 90 percent of city collector streets had low to moderate ratings.
- On the other end of the LTS scale, extreme ratings were shown for 60 percent of the highways for walking travelers, and 85 percent of bicyclists. This is the highest level of stress and is considered very challenging.
- Extreme or high bike LTS was noted due to high speeds and traffic volumes and unprotected bike facilities. This includes both state highways and short segments of NE Harney Street, NE 31st Street, NE Yaquina Heights Drive, SE Bay Boulevard and SE Ferry Slip Road.
- Sixteen of the 20 intersections studied on US 101 and US 20 had extreme or high LTS scores due to non-compliant ADA curb ramps, complex elements or limited refuge or enhancements at the crossing. Bicycling LTS has similar scores at these locations.
- NW Oceanview Drive, a component of the Oregon Coast Bike Route, was rated at extreme level of traffic stress between US 101 and the intersection with NW Edenview Way, and medium level of traffic stress from there to Spring Street.

System deficiencies were noted in cases where the walking or bicycle facilities had major gaps, extreme LTS, or were near important destinations, such as parks, schools, transit stops or essential services. These were flagged to be reviewed for possible system improvements (see Chapters 5 and 6).

TRANSIT SERVICES

Lincoln County Transit operates a city loop bus service, an intercity bus service, and a paratransit service. The loop service through Newport connects key destinations six times each day, seven days a week and in the evening. While most residents and businesses are located within one-half mile of a loop transit stops, the time between buses (up to 90 minutes) and limited-service hours (7 am to 5 pm) moderates it effectiveness for residents and visitors.

The intercity transit service operates routes to Corvallis and Albany four times each day, to Lincoln City four times each day, to Yachats four times each day, and to Siletz six times a day between Monday and Saturday.

Lincoln County Transit's paratransit service provides public transportation to persons who are unable to use regular fixed route buses. Curb to curb paratransit service, in wheelchair lift equipped minibuses, is available generally between 8:00 a.m. and 3:30 p.m. Monday through Friday.

Lincoln County's transit development plan through 2028 intends to enhance the frequency of services and add more stops on the loop to better serve more riders. This includes two new loop routes with shorter headways between more popular local destinations.

OTHER TRANSPORTATION SYSTEMS

Freight Network

US 101, north of US 20, is a designated federal truck route and US 20, east of US 101, is a designated Oregon freight route. With growing traffic volumes, six intersections along the state highways would not meet their currently adopted mobility target. These are the same six locations noted under the **Motor Vehicle System Performance Issues** section above.

Other locations with identified freight needs include Bay Boulevard which is a working waterfront and is a key freight generator for the City of Newport. This area is also a tourist destination which can create conflicts between the high volume of pedestrians, passenger cars, and freight vehicles which serve Newport's fishing industry.

Freight vehicles face the steep grades for northbound traffic approaching the Yaquina Bay Bridge. The recent relocation of the traffic signal from SE 32nd Street to SE 35th Street has improved this operational issue. The bridge has weight limit restrictions.

Airport

The Newport Municipal Airport, owned and operated by the City of Newport, is a public-use airport located east of US 101 off SE 84th Street, approximately five miles south of downtown. This airport provides general aviation for Newport and surrounding coastal communities and is identified as a critical resource by the Oregon Department of Aviation for emergency response following a major earthquake or tsunami. Currently, the airport supports general aviation aircrafts, cargo, US Coast Guard helicopters, and air ambulance flights.

Waterways

The Port of Newport maintains and operates separate commercial and recreational marinas to serve Newport's ship traffic. The commercial marina, located on the north side of Yaquina Bay, south of Bay Boulevard includes four docks for commercial vehicles and serves a large, prolific fishing fleet and a yacht club. This marina can accommodate vessels up to 100 feet. The recreational marina is located on the south side of Yaquina Bay, near South Beach, with space for 522 vessels and includes power, water, fuel, and sanitary services as amenities. This marina also serves as a public boat launch with space for trailer storage. The Port also provides an International Terminal with a multi-use shipping facility that is one of three deep draft ports on the Oregon Coast. This terminal is located on a 17-acre site about 2.5 miles from the ocean entrance.

SYSTEM DESIGN & MANAGEMENT PRINCIPLES (CHAPTER 4)

This chapter presents several refinements to Newport's multimodal transportation system hierarchy and facility design requirements. The recommended changes for city streets, trails, and shared-use pathways were developed to improve safety and accessibility for all users, and to directly responds to several of the critical community issues:

- Developing an integrated multi-use bike and pedestrian network.
- Developing neighborhood traffic calming measures and ped safety needs.
- Refining street cross-sections requirements to provide options that address constraints.

This chapter also acknowledges recent guidance from ODOT's *Blueprint for Urban Design,* which provides a flexible approach to improvements adjoining the state highways that allow cities to better accommodate urban development that offer enhanced walking, bicycle, on-street parking, and store front amenities. ODOT's Highway Design Manual and Traffic Manual incorporate urban design guidance from the BUD. For the full technical presentation of system design and management changes, please refer to *Transportation Standards (Technical Memorandum #10)* in Appendix K.

STREET FUNCTIONAL CLASSIFICATION CHANGES

The functional classification of a street or roadway defines how it is intended to be used, and its relative purpose compared to other facilities in the network. Transportation agencies that manage and maintain highway and street systems commonly use this practice, including federal, state, county, and city jurisdictions. The City of Newport chose to refine its street functional classifications for city facilities that align with local community values.

The major changes to the street functional classification designations for City of Newport Streets include the following:

- **Designating State Highways as the only Arterial Roadways -** Several city streets that were previously designated as arterials roadways were downgraded to better match their intended use today and in 2040. Arterial streets are primarily intended to serve regional and through traffic. It is determined that only the two State Highways provide that type of service.
- **Dividing City Collector Streets into Two Tiers, Major and Neighborhood Collector** - The city previously had one category for collector streets, which are intended to connect neighborhoods to each other and to arterial roadways. The top tier collector was renamed to a Major Collector. A second tier of collector roadway was introduced where it was most appropriate to apply traffic calming techniques in neighborhoods, and to tailor bike and pedestrian designs to best match the local environment.
- **Adding Private Streets as a special type of Local Street** - A new designation was added to show Private Streets, which are owned and maintained by the adjoining property owners. Often, these are driveways or private roadway connections that serve four or fewer parcels.
- **Local Truck Routes Added** – In addition to the state and federal designated truck routes on US 101 and US 20, there are several city streets that serve as key local truck routes within the community. These routes were added to the city's freight network to highlight the need to design and manage them to serve trucks. Examples include Bay Boulevard, and SE Marine Science Drive.

MULTIMODAL NETWORK DESIGN

Street designs are based on the functional classifications. City street improvement projects generally accompany newly developing or redeveloping areas of the city. Roadway cross-section design elements include travel lanes, curbs, furnishings/landscape strips, sidewalks on both sides of the road, and bicycle facilities. In some cases, site constraints may prevent minimum standards from being applied, and design exceptions are required.

The recommended design standards for the City of Newport presented in Chapter 4 encompass all levels of streets, trails and pathways. For full details, refer to that chapter. A summary of the key changes for network design types follows below:

- **Added Yield or Shared Streets -** A new option for local streets was added to recognize cases where traffic volume is low (fewer than 500 vehicles daily). These cases were referred to as Yield or Shared Streets, and they allow narrower street widths (see Table 2, Chapter 4) and lower speed limits.
- **Sidewalk Minimum Width Varies** - The minimum sidewalk width was changed to be wider depending on the street classification, and fronting land use types (see Table 3, Chapter 4). For example, this allows added space for street side amenities in commercial districts.
- **Bicycle Facilities Tailored to Street Classification** – To better support an integrated bike network, the design standards were modified to better match the required bike facilities with the on-street conditions experienced by cyclists. As shown in Table 4, Chapter 4, where traffic volumes and speeds are high like on the state highways, wide and protected bike facilities are preferred. Whereas, in neighborhoods the bikes can more readily share the street with motor vehicles.
- **Minimum Pedestrian and Bicycle Facilities** – These design standards apply to pedestrian trails, accessways, and shared-use pathways, showing the minimum facility width for each case (see Table 5, Chapter 4).

ADDITIONAL TRANSPORTATION PLANNING STANDARDS AND OTHER ISSUES

A new set of standards are recommended that the City of Newport can apply during on-going development review, and when plan amendments are being considered. These new transportation standards provide staff with a quantitative basis for reviewing proposed development plans and other planning proposals that may affect local transportation conditions. The additional standards include the following:

- **Vehicle Mobility Standards** – The metrics shown in Table 6 of Chapter 4 define the thresholds of acceptable congestion on city streets for a range of intersection types. These standards can be applied to form the basis for requiring conditions of approval for pending development to ensure that the ultimate facility design matches the expected demands.
- **Multimodal Connectivity** – The spacing standards in Table 8 of Chapter 4 define the minimum and maximum spacing standards for block length, driveway spacing, setbacks, and space between ped/bike connections. The intent of these standards is to provide for efficient, safe, and timely multimodal travel, particularly in newer neighborhoods designs.

The final two sections of Chapter 4 highlight unique natural hazards facing the City of Newport, and the city's response to manage those conditions. This includes the Oregon Seismic **Lifeline Routes** that facilitate emergency evacuation and recovery routes following disasters, such as a tsunami event. This TSP includes projects that promote seismic resilience on lifeline routes, adds pedestrian or bicycle facilities on evacuation routes, and other wayfinding projects.

Also highlighted are the **street stormwater drainage management** strategies that apply to new development areas and major infrastructure improvements, such as new or expanded roadways. These strategies are acutely important in many areas of the city, and most notably the Agate Beach neighborhood, to mitigate runoff impacts such as further erosion of coastal bluffs.

PROJECT DEVELOPMENT AND EVALUATION (CHAPTER 5)

Building the updated project list for this TSP involved identifying several new projects to specifically address new community concerns and combining them with past projects from other local transportation plans including the 2012 TSP, Oregon Coast Bike Route Plan and Yaquina Bay Recreation Site Plan.

The prioritization process was applied to emphasize improved system efficiency and management over adding capacity. These priority outcomes were then compared to city goals and objectives for the transportation investments. This process allows the city to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel.

PROJECT FUNDING

FUNDING SOURCE	AMOUNT AVAILABLE BY 2040
NORTH SIDE URBAN RENEWAL DISTRICT	$37.9 million
OTHER CITY/STATE FUNDS	38.3 million
TOTAL FUNDS AVAILABLE	**$76.0 million**
TOTAL ASPIRATION PROJECTS	**$226.7 million**

Each project was reviewed to assess which agency would lead the project and the likely funding source. It is important to note that these funding assumptions do not obligate any agency to commit to these projects. In general, projects were assigned to either the City of Newport or ODOT as the lead agency, with a few cases where they may jointly fund a project. Also, each project was assigned an assumed funding source, which included the City's North Side Urban Renewal District, South Beach Urban Renewal District, and other City/State revenue. It is recognized that there may be other partnering opportunities with ODOT and Lincoln County Transit, these decisions are ultimately up to those agencies. Also, private development will also likely build TSP projects in coordination with land use actions and future development in the city.

Based on historical and forecasted funding levels, the city expects to have about $76 million through the year 2040 for transportation projects in this TSP. This includes about $38 million for projects in the North Side Urban Renewal District boundary and another $38 million from other City and State funding sources for other citywide projects. And although it was not included in the TSP revenue forecast, the South Beach Urban Renewal District will also provide an additional $3 million in funding for remaining projects in the district boundary. This is still far below the funding required to implement all the projects in this plan, which total approximately $227 million.

A high priority subset of the City's Aspirational Projects that are constrained to a level of funding that is expected to be available for the next 20 years is presented in Chapter 6 section of this Executive Summary. These projects are referred to as **Financially Constrained**, as they represent the city's highest value projects that can reasonably be funded through 2040.

SPECIAL TRANSPORTATION STUDIES

A series of studies were conducted that provided greater depth of technical review and public engagement than is common for a TSP update. The focus of these special studies included corridor solutions along US 101 and US 20 in the downtown area, and a closer look at the feasibility, effectiveness, and cost to construct a proposed Harney Street extension. The 2012 TSP shows a proposed Harney Street extension parallel to US 101 north of US 20 to NE 36th Street that would provide alternative circulation for longer trips to relieve congestion in the downtown area.

Each of these projects represent large-scale capital investments that could significantly alter Newport's transportation network and travel patterns by increasing roadway capacity for motor vehicles, bicycles, and pedestrians. In addition to mobility and access improvements, the highway corridor studies also sought to leverage economic development opportunities to revitalize the downtown commercial core area.

The following discussion summarize results of each special transportation study. Please refer to Chapter 5 and the Solutions Evaluation (Technical Memo #8) in Appendix I for full details.

US 101 Downtown Corridor (SW 9th Street to SW Angle Street) – Three options were considered for this corridor. Two involved forming one-way couplets with the existing highway and SW 9th Street, and one retained the highway on its current alignment. However, that concept also includes providing quality bicycle facilities on parallel routes of SE 9th Street to reduce impacts to properties adjacent to the highway.

The one-way couplets would provide for southbound traffic along the present highway alignment, and northbound flow along SW 9th Street. The difference between the two couplets was one was longer, it began at the existing intersection of SW 9th Street and US 101, and the other was shorter, it began at SW Fall Street. All three options would upgrade the existing roadways to meet current ODOT design standards, which would address the narrow travel lanes, and lack of bike facilities.

Based on feedback from the public and the PAC, the Long Couplet options was set aside from further review. It was agreed that the Long Couplet concept was not worth the extra investment for a longer improved facility, especially since the area around the hospital complex was already being redeveloped along the adjoining parcels nearby. The PAC suggested that the remaining two options advance for further deliberation during the public adoption process of the TSP.

US 20 Downtown Corridor (Harney Street-Moore Drive to US 101) – Two options were considered for this corridor. One involved forming a one-way couplet with the existing highway and NE 1st Street. In this concept, the eastbound flow would use the existing highway, while the westbound flow of traffic would use NE 1st Street. The other option was to upgrade and expand the highway along its present alignment. Based on feedback from the public and the PAC, the preferred option was the existing two-way highway along its current alignment. However, that concept also includes providing quality bicycle facilities on parallel routes of NE 1st Street to reduce impacts to properties adjacent to the highway.

US 20/US 101 Intersection – Several design concepts were evaluated at this location to serve traffic growth and still meet desired performance targets. Concepts included adding more vehicle turning lanes on high volume approaches, restricting Olive Way to westbound only flow, and converting the intersection to a multi-lane roundabout. The preferred concept is to add another southbound left-turn lane from US 101 onto eastbound US 20 (see INT4 for details). Initial sketches were made to illustrate how roadway widening might impact to adjoining properties (see initial diagrams in Appendix P).

Harney Street Extension (NE 7th Street to NE 36th Street) – The alignment of this proposed extension was evaluated in-depth by project team engineering staff to navigate the many environmental and topographical constraints of this route. These outcomes of these engineering studies show (see Figure 38, Chapter 5) that the primary new construction would be near NE 7th Street, then it bends around the hillside to the east and then connects to the existing Harney Street at NE Big Creek Road. This route was expected to carry moderate traffic volumes that would provide some relief to the US 101 corridor. However, because of the high estimated cost of the construction, at over $40 million, the PAC recommended that this project be set aside from priority city funding at this time.

NW Nye Street Extension/NW Oceanview Drive – A northerly extension of NW Nye Street to connect to NW Oceanview Drive as a full street connection or as shared-use path only was recommended to address safety and access concerns in this area (see Project EXT12 and TR14 for details). Two circulation options were advanced. The first option limits the Nye Street extension to pedestrian and bike access only with no changes to Oceanview Drive circulation. The second option would allow full motor vehicle, ped/bike use on the Nye Street extension, and restrict Oceanview Drive to one-way southbound for motor vehicles between Nye Street and NE 12th Street. The former northbound travel lane would be restriped as a shared-use path for ped/bike use in the one-way section.

ALTERNATE HIGHWAY MOBILITY TARGETS

As Newport grows, the mobility targets at several state highway intersections will not be met. Today, all state highway intersections comply with those mobility targets. However, by 2040, four highway intersections will exceed that target, including the US 20/US 101 intersection. For a full description, please refer to the Alternate Mobility Targets (Technical Memo #11), in Appendix L.

ODOT has a policy that allows their agency to change mobility targets within local jurisdictions to allow for higher congestion levels. To do so requires the adoption of the mobility targets by the Oregon Transportation Commission or their district representative. This policy was established because ODOT acknowledges that the limitations of its funding does not provide sufficient resources on state highway facilities to meet their preferred mobility targets. By changing the targets, the local jurisdiction can proceed with planned growth consistent with their adopted land use and transportation plans.

For Newport, the recommended change is to increase the numerical v/c ratio value to 0.99 at all state highway intersections. If enacted, this would be consistent with the numerical standard that is applied to state highway intersections in the South Beach area.

PROJECTS AND PRIORITIES (CHAPTER 6)

This chapter presents the transportation system improvements projects that were selected to address the system needs revealed by the technical analysis and the input from the community. The full aspirational project list that includes over 200 projects is provided in Chapter 6. The **Financially Constrained** (reasonably likely to be funded by 2040) projects are shown in Appendix R. These represent the higher priority projects that can reasonably be funded given the available city and state transportation resources of about $76 million through 2040.

IMPLEMENTATION ACTIONS (CHAPTER 7)

The City of Newport TSP update incorporates several elements that require further action to facilitate full implementation of the plan.

SUPPLEMENTAL FUNDING OPTIONS

Providing adequate funding for capital investments and on-going maintenance of transportation systems and services is a major challenge. In addition to the two Urban Renewal Districts, the City is encouraged to seek more funding opportunities to advance projects sooner. In general, the best candidates are a transportation utility fee, a local fuel tax increase, and a short-term property tax levy. However, given that the city recently put a local gas tax increase on the voter ballot that failed, perhaps the other options could be further pursued.

ACTION: Pursue and enact supplemental local transportation funding option.

NEIGHBORHOOD TRAFFIC MANAGEMENT TOOLS

The Transportation System Plan identifies a new classification of city streets that are the best candidates for applying neighborhood traffic management (NTM) strategies. The challenge with a NTM program is to identify a clear and objective process for collecting community inputs, assessing the prevailing concerns, and evaluating which, if any, NTM solution is appropriate to be installed. This will require developing guidelines about which NTM strategies are best for Newport, and where and how they are to be applied. In addition, many cities balance the technical review process with a consensus opinion of the affected neighbors to help ensure community satisfaction with the NTM decision.

ACTION: It is recommended that city develop and implement a NTM program that formalizes these processes.

STREET CROSSINGS

Streets with high traffic volumes and/or speeds in areas with significant volume of pedestrian activity generally require enhanced street crossings with treatments to improve the safety and convenience for pedestrians. The TSP includes several crossing enhancements; however, the city should also update their development code to match the Transportation Facility and Access Spacing Standards stated in the TSP.

ACTION: Update Municipal Code to incorporate street and access spacing standards identified in the TSP for city streets

Similarly, on state highways enhanced pedestrian crossing treatments should be considered on high speed or high-volume roads (*e.g.* US 101, US 20). To ensure these types of treatments are considered during the development review process, the city guidelines for traffic impact studies should be updated to require these types of studies.

ACTION: Amend the city's traffic impact analysis guidelines to include review of pedestrian crossing treatments consistent with NCHRP Report 562.

VEHICLE MOBILITY STANDARDS

The City of Newport does not have adopted mobility standards for motor vehicles. The city should amend its mobility standards for planning and development review to establish clear guidelines for selecting intersection design solutions.

ACTION: Amend city development code to introduce vehicle mobility standards on city streets consistent with the TSP (see specifics in Chapter 7).

ADDITIONAL ACTIONS

Additional implementation actions should:

- Amend the Public Facilities Chapter of the Newport Comprehensive Plan to align its transportation goals and objectives with those contained in the TSP.
- Take into consideration the larger parcel impact of right-of-way acquisitions for transportation projects, and provide fair market compensation for such impacts.
- Support and promote emerging transportation technologies, where feasible, including the rollout of infrastructure for electric vehicles.
- Require that transportation solutions selected for commercial core areas along US 101 and US 20 promote economic revitalization of these areas in addition to addressing broader transportation needs of the community.
- Identify the need for project specific geotechnical analysis in the Agate Beach area in line with the recommendations contained Appendix M.

Chapter 2: Transportation System Context

This chapter introduces Newport and describes what a Transportation System Plan (TSP) is and how it was developed. The process involved a formal decision-making structure, community engagement, and a structured technical analysis.

NEWPORT AT A GLANCE

Located along the shores of the Pacific Ocean and Yaquina Bay, Newport is a dynamic City with neighborhoods that cater to residents and visitors of all ages and interests. The population of permanent residents in the City is 10,125, but that can rise to 25,000 during a summer day, as visitors are drawn to the City's beachfront, numerous outdoor activities, attractions, eateries, shopping and more. It is home to an active fishing industry, miles of sandy beaches, Oregon State University's Hatfield Marine Science Center, the Oregon Coast Aquarium, and the home port of the National Oceanic and Atmospheric Administration (NOAA) Marine Operations Center-Pacific. Several neighborhoods are within Newport including Agate Beach, the Deco District (aka Downtown Newport), Nye Beach, Bayfront and South Beach, each with its own unique character.

FIGURE 1: KEY TRANSPORTATION FACILITIES (NORTH MAP AREA)

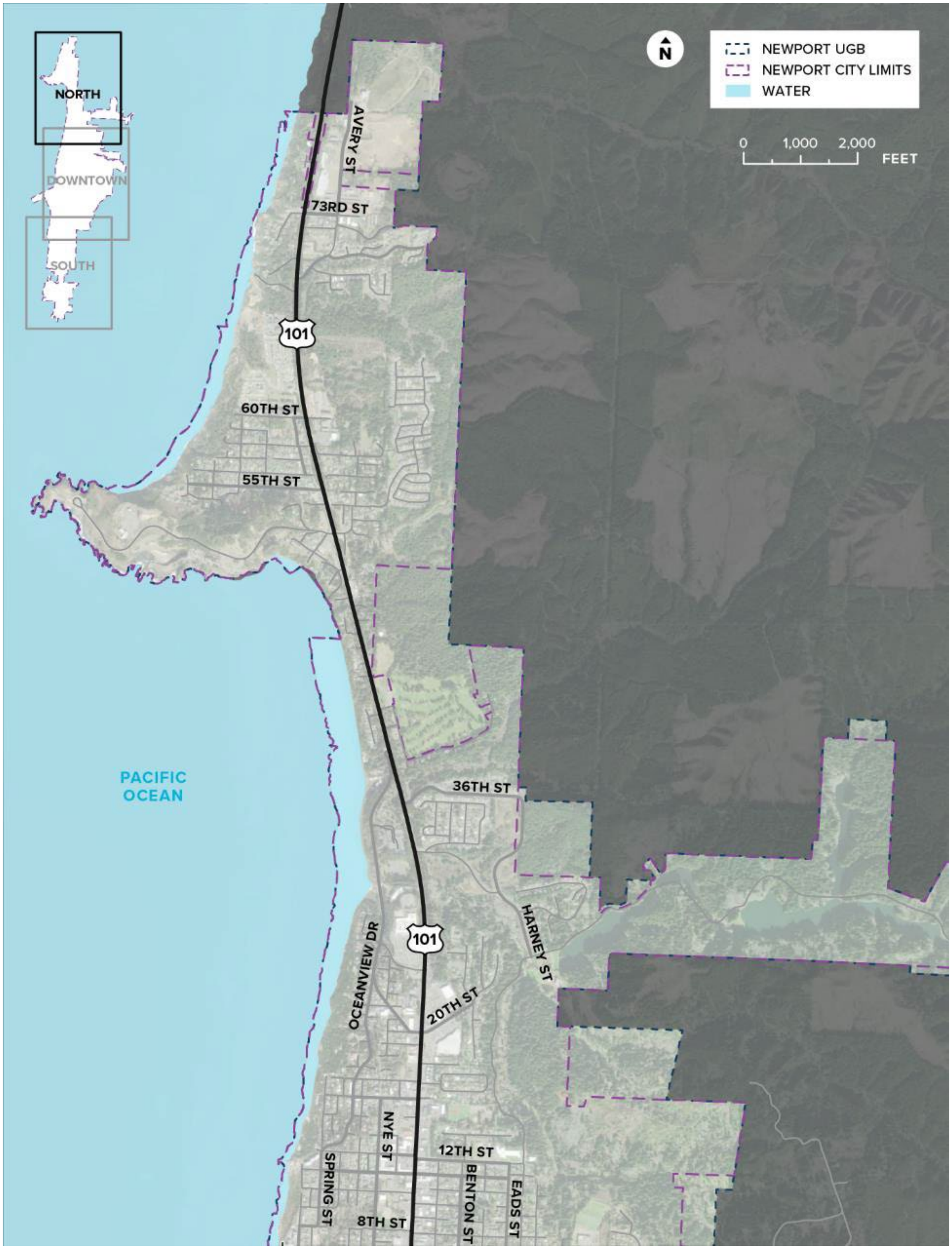


FIGURE 2: KEY TRANSPORTATION FACILITIES (DOWNTOWN MAP AREA)

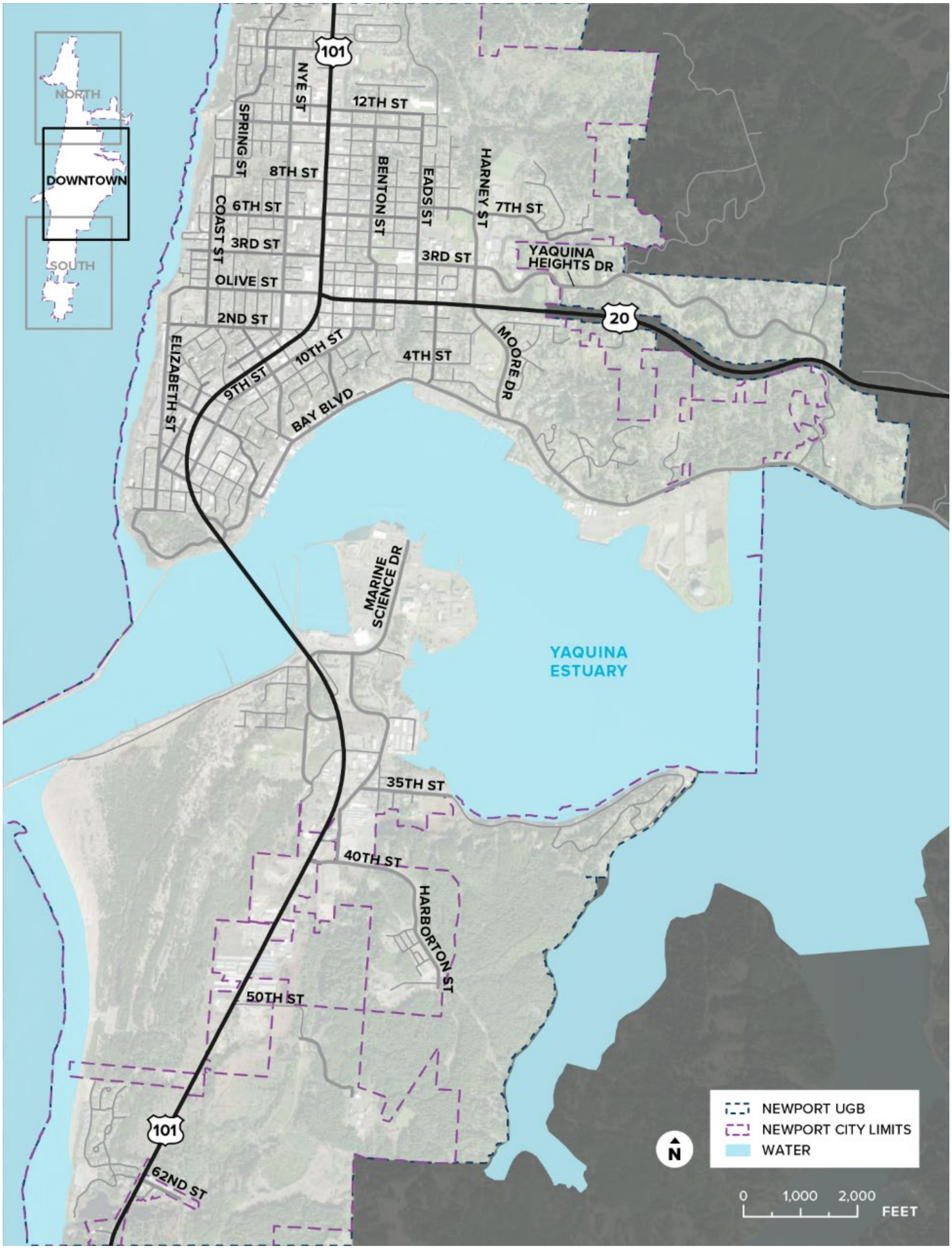
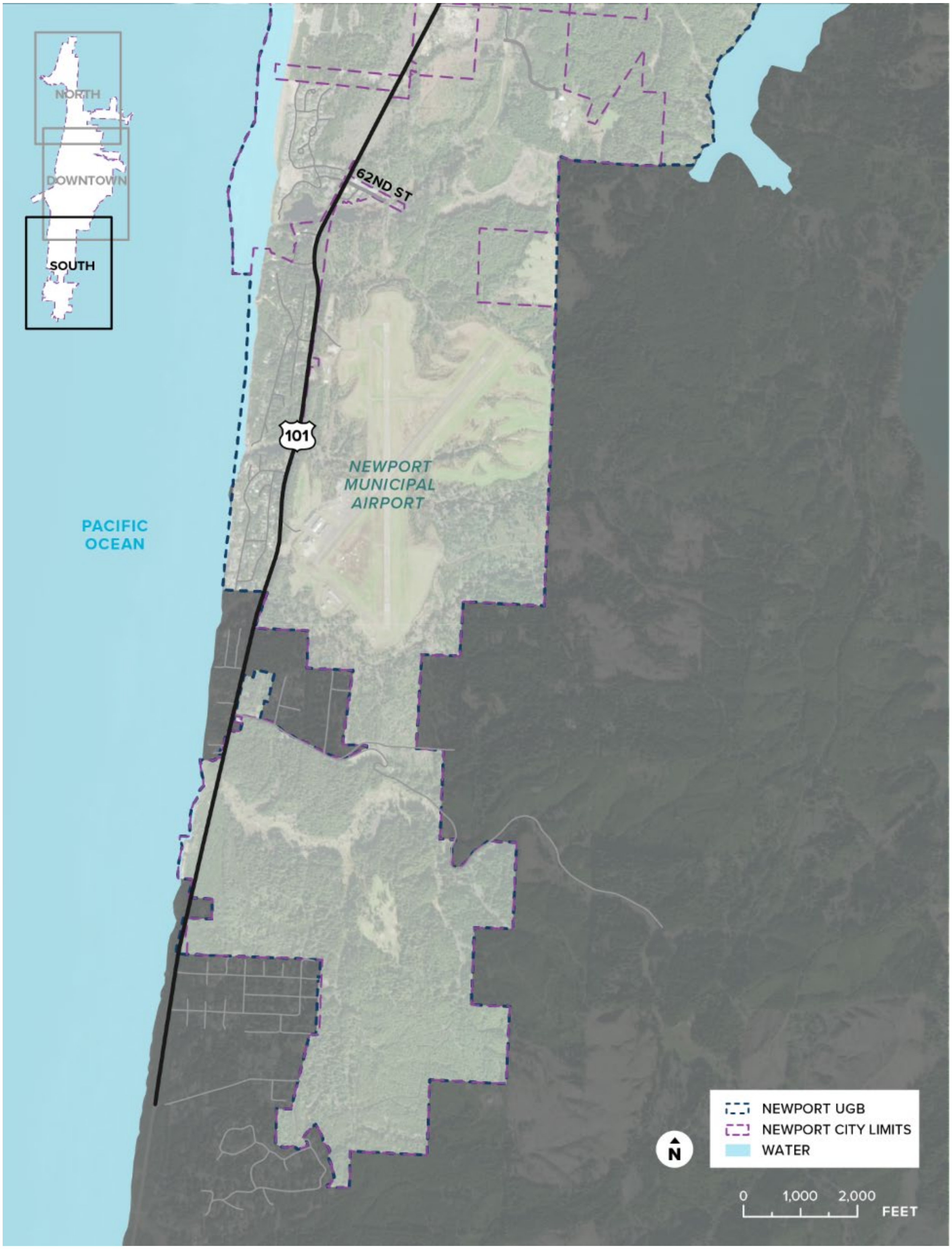
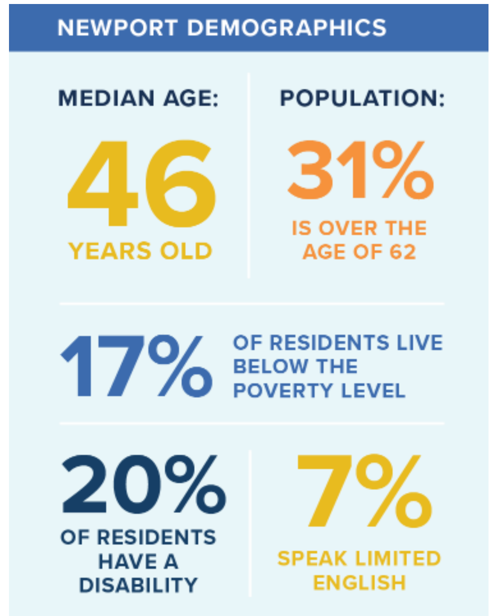


FIGURE 3: KEY TRANSPORTATION FACILITIES (SOUTH MAP AREA)



NEWPORT DEMOGRAPHICS

FIGURE 4: KEY DEMOGRAPHICS



Residents of Newport have a median age of 46 years and just over half, 51%, of all residents are within the peak working age range. Also shown in Figure 4, about one-third (31 percent) of the population is over the age of 62. The City has similar demographics with the rest of Lincoln County in terms of the share below the poverty income level, 17 percent, and people with disabilities, 20 percent, while 7 percent speak limited English. These demographics are significantly different from those of the State, with the City accounting for a 10 percent larger share of residents aged over 62 and up to a 5 percent greater share of residents living below the poverty level, with a disability, or speaking limited English. The source for the Newport demographic data was taken from the American Community Survey, 2015 to 2019, as reported by the US Census Bureau.

As growth continues in the City, it will likely to show a higher share of older residents choosing to retire on the coast compared to other areas of the State, which influences the likelihood of more residents living on limited retirement incomes or having a disability. The City will also likely continue to see younger people and families choosing to visit and live in Newport, and likewise will continue to see people of all ages and abilities walking, biking and using transit.

KEY TRANSPORTATION OPPORTUNITIES AND CHALLENGES

Newport faces the challenge of accommodating population and employment growth while maintaining acceptable service levels on its transportation network. The transportation system must accommodate highway through traffic, residents, and thousands of tourists who are here in the summer and over holiday weekends. With limited funding for transportation improvements, and built and natural environment challenges, the City must balance its investments to ensure that it can develop and maintain the transportation system adequately to serve the City and everyone who travels in it. Some of the key transportation opportunities and challenges in the City are summarized below, with more details provided in Chapter 3 of this TSP.

US 101 and US 20

U.S. Highway 101 (US 101) and U.S. Highway 20 (US 20) are the backbone of Newport's transportation network. US 101 runs north and south through the City, connecting coastal communities along the entire west coast of the United States, while US 20 runs east and west through the City, connecting it to Corvallis, Interstate 5 and eventually Boston, Massachusetts 3,365 miles to the east. These roadways intersect in the downtown area forming one of the most complex intersections in the City. These statewide highways serve as designated freight routes along all of US 20 and the northern portion of US 101, specifically the section north of US 20 which serves the primary commercial centers. Because these highways carry the highest levels of traffic in the city, they present many great opportunities, but also bring many challenges. Each day these highways bring thousands of visitors and economic opportunities for the City. These visitors often arrive in a mix of large recreation vehicles or towing trailers that must traverse narrow and busy sections of streets through the City. These highways were designed and built in an era that focused on serving motor vehicle traffic, and they lag behind ODOT's current vision of a complete multimodal street facility. As a result, this creates conflicts with parked vehicles, and often leads to uncomfortable and difficult walking and biking conditions for residents and visitors along and across these highways.

Downtown

US 101 runs through Newport's downtown area and the historic heart of the City, spanning both sides of US 101 between US 20 and Yaquina Bay to the north and south, and Bayfront and Nye Beach neighborhoods to the east and west. The central city is an area where many of the properties are underutilized or in economic distress with vacant storefronts and aging, poorly maintained buildings. The City established an urban renewal district in 2015 to generate funding to revitalize the area and is considering how the transportation system can be redefined to catalyze economic development and provide infrastructure needed to support additional density. The downtown area is home to many shopping, dining, cultural, and City service establishments and has emerged as a destination for residents and visitors alike. The increased energy draws many people who walk, ride bikes and take transit to and from nearby neighborhoods and along and across streets throughout downtown. Many more people drive vehicles and park within the area, and then walk or bike. Streets will need to be repurposed and reimagined to complement the street side activity, support desired economic development and balance the expected uptick in travel among all travel modes.

Yaquina Bay Bridge

Just to the south of Newport's downtown area is Yaquina Bay and the iconic Yaquina Bay Bridge. Here the structure serves US 101 and spans 3,223 feet across Yaquina Bay. It opened in 1936 and provides the only crossing of Yaquina Bay and connection to the South Beach area of the City and its major employment and recreational destinations. With one travel lane in each direction, today the bridge carries nearly 17,000 motor vehicles per day during the summer and 14,000 per day during an average weekday. With narrow roadway-adjacent walkways and no separated bicycle facilities, the crossing is often uncomfortable and challenging for pedestrians and bicyclists.

In 2013, ODOT placed weight limit restrictions on this bridge considering the degraded maintenance conditions of the structure, particularly as it relates to seismic events. This weight limitation was intended to prolong the effective service life of the bridge before major reconstruction would be required. The current estimate for replacing the bridge exceeds $200 million. Given the uncertainty of the bridge's viability long-term, the Newport City Council requested a statement from ODOT regarding their plans for this facility. In a letter dated February 4, 2021, the ODOT Director responded and indicated that the Yaquina Bay Bridge is on their Seismic Resilience Plan, and a specific date for funding major construction is uncertain at this time. However, the letter did also indicate that based on their understanding to date, retaining the bridge essentially in its current location would be the preferred option to minimize environmental, engineering and community impacts.

Nye Beach

Nye Beach was named for John Nye who claimed a 160-acre parcel in 1866. In the 1880's the property was purchased by Sam Irvin, and in the 1890's the "summer people" began coming to Newport Beach in large numbers. They came by train to Yaquina Bay, where the railroad ended, then by ferry boat to the Bayfront, and finally by the boardwalk built in 1891 to connect the Bayfront with Nye Beach.

Today, Nye Beach has become a mixed-use neighborhood with direct beach access anchored by Performing Arts and Visual Art Centers. Commercial development is concentrated along Beach Drive and Coast Street, both of which include streetscape enhancements that encourage a dense pedestrian friendly atmosphere. This area includes a mix of retail, dining, lodging, professional services, galleries, single family homes, condominiums, long term and short-term rentals.

Bayfront

A working waterfront with a mix of tourist-oriented retail, restaurants, fish processing facilities (e.g. Pacific Seafood), and infrastructure to support the City's commercial fishing fleet. The Port of Newport is a major property owner, and a boardwalk and fishing piers provide public access to the bay. The area is terrain constrained, with steep slopes rising up from commercial sites situated along Bay Boulevard.

South Beach

Nestled on the south side of the Yaquina Bay Bridge, Newport's South Beach provides a mix of regional institutions, recreational facilities, neighborhoods, and retail businesses, including the popular Oregon Coast Aquarium, Hatfield Marine Science Center, OMSI's Camp Gray, Oregon Coast Community College, Newport Municipal Airport, and the Port of Newport's South Beach Marina and RV Park. The City's largest residential planned development is also located in South Beach, known as the "Wilder" community.

Natural Hazards

As an Oregon coastal city, Newport is at risk from a variety of natural hazards that should be considered in developing a Transportation System Plan to reduce risks to public health, facilitate emergency evacuation and prolong the serviceable life cycle of transportation infrastructure.

The first category of hazard is the tsunami events that follow earthquakes. The impacts on the Oregon coastline for a range of potential major earthquake events has been studied extensively by Oregon Department of Geology and Mineral Industries (DOGAMI), which is the best source of information for identifying areas that may be subject to tsunami inundation. The City and State have taken actions to prepare for these events, including developing emergency response and evacuation routes, and designating evacuation assembly areas. Establishing resilient transportation facilities and bridges along these routes is a critical element to facilitate the movement of people during these emergency situations. The tsunami inundation and assembly areas in Newport can be found in the Appendix, Technical Memo #5, Existing Conditions.

Landslides and bluff erosion also present significant challenges to maintaining a stable foundation for roads and structures. The soil composition in many beach areas require special design considerations to adequately treat storm drainage and runoff to mitigate against degrading soil conditions. These design treatments are commonly applied in designated areas such as Agate Beach, which has experience chronic bluff erosion in recent years.

PURPOSE OF THE TSP

The TSP is a long-range plan to guide future transportation investments for the next 20 years and beyond within the Urban Growth Boundary (UGB). It is a key resource for implementing transportation system improvements that address current deficiencies and will also serve expected local and regional growth, and ensure that they align with the community's goals, objectives, and vision for the future. This TSP was developed through community and stakeholder input and is based on the transportation system's needs, opportunities, and anticipated available funding. The requirements of a TSP are summarized in Figure 5.

FIGURE 5: REQUIREMENTS OF A TRANSPORTATION SYSTEM PLAN

REQUIREMENTS OF A TSP

A TSP is required by the State of Oregon Transportation Planning Rule (TPR). Oregon Administrative Rule 660-012-0015 defines the primary elements of a TSP. The TPR requires that a city TSP includes the following components:

1. Comprehensive understanding of the existing multimodal transportation system that serves the city and how well that system performs its expected function today
2. Reasonable basis for estimating how the city and the surrounding region might grow in its population and employment over the next 20 or more years
3. Evaluation of how the expected growth could change system performance
4. Goals, policies and transportation system improvements that address community multimodal transportation needs
5. Understanding of the on-going funding required to build and maintain the transportation system as the city grows

In compliance with State requirements, the City of Newport updated their 2012 TSP. This latest update provides a plan for the City to support the transportation needs from land use growth within the UGB through the 2040 planning horizon. The City's UGB is shown earlier in Figure 1. The UGB is a land use planning line to control urban expansion and promote the efficient use of land, public facilities, and services. Land inside the UGB supports urban services such as roads, water and sewer systems, parks, schools and fire and police protection. This boundary also supports 20-years' worth of population and employment growth, of which cities must plan for urban services.

The TSP is the City's tool for planning transportation infrastructure for all modes within the UGB. This TSP will be used by the City to make strategic decisions about transportation system investments and will be instrumental in supporting grant applications to fund future projects, and ensuring projects are built in coordination with land use actions and future development.

SETTING DIRECTION FOR THE PLAN

A transportation vision, and set of goals, objectives, and evaluation criteria (see Figure 6) were used to guide the project team in the development, evaluation, and prioritization of solutions that best fit the community and provided the basis for policies to support Plan implementation. They were established with guidance from the Newport City Council and Planning Commission, Project Advisory Committee (PAC) and general public.

Collectively, the transportation-related goals, objectives, and evaluation criteria describe what the community wants the transportation system to do in the future, as summarized by a vision statement. A vision statement generally consists of an imaginative description of the desired condition in the future. It is important that the vision statement for transportation align with the community's core values.

Goals and objectives create manageable stepping stones through which the broad vision statement can be achieved. Goals are the first step down from the broader vision. They are broad statements that should focus on outcomes, describing a desired end state. Goals should be challenging, but not unreasonable. Each goal must be supported by more finite objectives. In contrast to goals, objectives should be specific and measurable. Where feasible, providing a targeted time period helps with objective prioritization and achievement. When developing objectives, it is helpful to identify key issues or concerns that are related to the attainment of the goal.

The solutions recommended through the TSP must be consistent with the goals and objectives. To accomplish this, evaluation criteria based on the goals and objectives were developed. For the Newport TSP, they were used to inform the selection and prioritization of projects and policies for the plan by describing how well they support goal areas.

FIGURE 6: DIRECTION FOR THE PLAN

VISION FOR THE PLAN

VISION STATEMENT

Travel to and through Newport is safe and efficient, with convenient options available for everyone. Investments in the transportation system are made in a cost-effective manner and respect the City's resources. The system supports local business activity, and all streets, including US 101 and US 20, complement a vibrant streetscape environment where people stop and visit and can travel by all modes safely and comfortably.

GOALS AND OBJECTIVES FOR THE PLAN

GOAL 1 **SAFETY**

Improve the safety of all users of the system for all modes of travel.

Objectives:

- Reduce the frequency of crashes and strive to eliminate crashes resulting in serious injuries and fatalities.
- Proactively improve areas where crash risk factors are present.
- Improve the safety of east-west travel across US 101.
- Improve the safety of north-south travel across US 20.
- Apply a comprehensive approach to improving transportation safety that involves the five E's (engineering, education, enforcement, emergency medical services, and evaluation).

GOAL 2 **MOBILITY AND ACCESSIBILITY**

Promote efficient travel that provides access to goods, services, and employment to meet the daily needs of all users, as well as to local and regional major activity centers.

Objectives:

- Support expansions of the local and regional transit network and service.
- Support improvements that enhance mobility of US 101 and US 20.
- Manage congestion according to current mobility standards.
- Support transportation options and ease of use for people of all ages and abilities.
- Ensure safe, direct, and welcoming routes to provide access to schools, parks, and other activity centers for all members of the community, including visitors, children, people with disabilities, older adults, and people with limited means.
- Provide an interconnected network of streets to allow for efficient travel.

GOAL 3 **ACTIVE TRANSPORTATION**

Complete safe, convenient and comfortable networks of facilities that make walking and biking an attractive choice by people of all ages and abilities.

Objectives:

- Continuously improve existing transportation facilities to meet applicable City of Newport and Americans with Disabilities Act (ADA) standards.
- Provide walking facilities that are physically separated from auto traffic on all arterials and collectors, and on streets and paths linking key destinations such as employment centers, schools, shopping, and transit routes.
- Provide low-cost improvements to enhance walking and biking on all arterials and collectors, and on streets and paths linking key destinations such as employment centers, schools, shopping, and transit routes.
- Provide safe street crossing opportunities on high-volume and/or high-speed streets.
- Provide walking access to transit routes and major activity centers in the City.
- Work to close gaps in the existing sidewalk network.
- Provide biking facilities that are comfortable, convenient, safe and attractive for users of all ages and abilities on or near all arterials and collectors, and streets and paths linking key destinations such as employment centers, schools, shopping, and transit routes.
- Provide biking access to transit routes, major activity centers in the City, and regional destinations and recreational routes.

GOAL 4 **GROW THE ECONOMY**

Develop a transportation system that facilitates economic activity and draws business to the area.

Objectives:

- Support improvements that make the City a safe and comfortable place to explore on foot.
- Manage congestion along freight routes according to current mobility standards.
- Provide safe, direct, and welcoming routes between major tourist destinations in Newport.

GOAL 5 **ENVIRONMENT**

Minimize environmental impacts on natural resources and encourage lower-polluting transportation alternatives.

Objectives:

- Support strategies that encourage a reduction in trips made by single-occupant vehicles.
- Minimize negative impacts to natural resources and scenic areas, and restore or enhance, where feasible.
- Support facility design and construction practices that have reduced impacts on the environment.

GOAL 6 **SUPPORT HEALTHY LIVING**

Support options for exercise and healthy lifestyles to enhance the quality of life.

Objectives:

- Develop a connected network of attractive walking and biking facilities, including off-street trails, which includes recreational routes as well as access to employment, schools, shopping, and transit routes.
- Provide active transportation connections between neighborhoods and parks/open spaces.
- Provide for multi-modal circulation on-site and externally to adjacent land uses and existing and planned multi-modal facilities.

GOAL 7 **PREPARE FOR CHANGE**

Ensure that the choices being made today make sense at a time when Newport is growing, and the transportation industry is rapidly changing.

Objectives:

- Anticipate the impacts and needs of connected and automated vehicles.
- Seek to supplement traditional transportation options with more emphasis given to walking, biking, and transit and consideration for new alternatives such as car sharing, bike sharing, driverless vehicles, ride sourcing, and micro-mobility.
- Explore opportunities to partner with state, regional, and private entities to provide innovative travel options.

GOAL 8 FISCAL RESPONSIBILITY

Sustain an economically viable transportation system.

Objectives:

- Improve transportation system reliance to seismic and tsunami hazards, extreme weather events, and other natural hazards.
- Identify and develop diverse and stable funding sources to implement transportation projects in a timely fashion and ensure sustained funding for transportation projects and maintenance.
- Preserve and maintain existing transportation facilities to extend their useful life.
- Seek to improve the efficiency of existing transportation facilities before adding capacity.
- Ensure that development within Newport is consistent with, and contributes to, the City's planned transportation system.

GOAL 9 WORK WITH REGIONAL PARTNERS

Partner with other jurisdictions to plan and fund projects that better connect Newport with the region.

Objectives:

- Coordinate projects, policy issues, and development actions with all affected government agencies in the area.
- Build support with regional partners for the improvement of regional connections.

SUPPLEMENTAL STRATEGIES

In addition to the goals and objectives outlined above, a set of supplemental strategies and guidelines were developed to address specific issues of concern within the Commercial Core and the Agate Beach areas of the City. The Commercial Core area is also commonly referred to as the Downtown. The strategies are extensions of the citywide goals and objectives to provide adequate depth and context for addressing the unique issues within these areas.

Commercial Core

- Consider improvements that enhance the safety of US 101 and US 20 and their intersections through the Commercial Core.
- Explore options for alternative highway routing through the Commercial Core.
- Consider options to meet the future capacity needs of the Yaquina Bay Bridge.
- Explore options for improved pedestrian and bicycle facilities across Yaquina Bay.
- Explore options for safe crossing opportunities of US 101 and US 20 in the Commercial Core.
- Consider streetscape improvements that define and enhance the character of the Commercial Core and serve as attractive gateways.
- Support the economic vitality of businesses in the Commercial Core by making multi-modal access safer, more convenient and more attractive.

Agate Beach

- Provide options for local street sections that consider the stormwater management needs of the Agate Beach area.
- Plan for local street connections adjacent to existing coastal routes given future erosion concerns.
- Evaluate safe crossing opportunities of US 101 in Agate Beach.
- Upgrade vehicle access onto US 101 to correct substandard conditions.
- Explore options to provide pedestrian and bicycle facilities on US 101 in Agate Beach.
- Explore options for a connection for pedestrians and bicyclists in Agate Beach to areas further south in the City.

PERFORMANCE BASED PLANNING PROCESS

The TSP utilizes a performance-based planning process. The community vision is distilled into the measurable goals and supporting objectives. These goals and objectives were used to identify evaluation criteria to help evaluate potential projects and to measure long-term alignment between Newport's transportation system and the community's vision of this system. The plan process is illustrated below in Figure 7, along with the key questions that were considered during three development stages of the TSP.

FIGURE 7: PERFORMANCE BASED PLANNING PROCESS

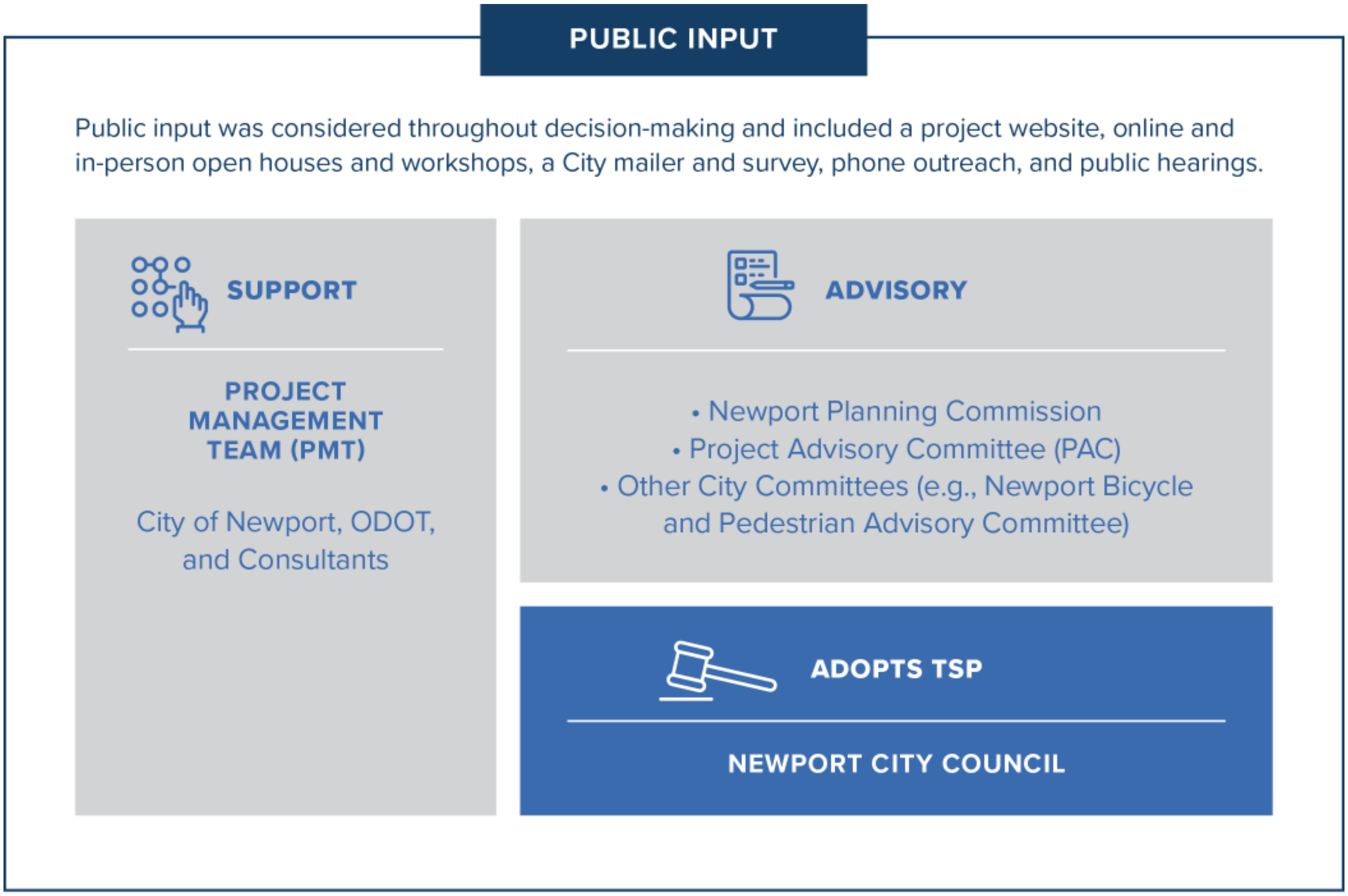
DECISION MAKING STRUCTURE

The decision-making structure for this TSP was developed to establish clear roles and responsibilities throughout the project. The decision-making structure (Figure 8) established a framework for broad-based community engagement for the project.

As the TSP was developed, the Project Management Team (PMT) worked with a Project Advisory Committee (PAC) that included local committee, neighborhood, and business representatives, emergency service providers, and agency staff members from the City of Newport, Lincoln County, and the Oregon Department of Transportation. The PAC was formed to provide community-based recommendations, and informed and guided the plan by reviewing draft deliverables, providing insight into community perspectives, commenting on technical and regulatory issues, and providing recommendations for the TSP.

The City Council and Planning Commission for Newport were all briefed on the development of this TSP throughout the process. The City Council made all final decisions pertaining to this TSP. The PMT made recommendations to the City Council based on technical analysis and community input.

FIGURE 8: NEWPORT TSP ROLES AND RESPONSIBILITIES



PUBLIC AND STAKEHOLDER ENGAGEMENT

The strategy used to guide stakeholder and public involvement throughout the TSP update reflects the commitments of the City of Newport and the Oregon Department of Transportation (ODOT) to carry out public outreach that provided community members with the opportunity to weigh in on local transportation concerns and to provide input on the future of transportation within the City and UGB.

Public outreach was conducted between November 2020 and August 2021 to share information about the TSP project. Community members, stakeholders, and other interested parties were invited to share their ideas and feedback about how people currently get around, what can be improved, and to solicit feedback on transportation projects. Feedback received through this outreach helped the City and its consultants address planned growth and the evolving transportation needs of residents. Feedback was also used to develop a list of transportation projects to be included in this TSP.

The Public and Stakeholder Involvement Strategy for the TSP (included in Appendix A) considered the demographic makeup of the area to inform outreach activities. Considering the COVID-19 pandemic, the project team adapted to provide several engagement opportunities (virtual, in-person, by phone and by mail) to enable community members to safely participate and provide meaningful input. Approximately 970 people were engaged through a variety of outreach opportunities. These opportunities are summarized in Figure 9. These engagement opportunities were promoted through social media posts, updates on the City and project websites, postcards mailed to residents within the City, emails sent to interested parties, stakeholders, and community organizations, and press releases. In addition, a virtual workshop was held with Spanish-speaking community members.

FIGURE 9: PUBLIC AND STAKEHOLDER ENGAGEMENT FACTS

SUMMARY OF COMMUNITY FEEDBACK

Overall, the respondents wanted to see improvements to Newport's transportation system that will benefit all residents and visitors, with a particular focus on the safety and circulation for the walking, biking and transit modes of travel. There was also a strong call for linking the transportation improvements to the city's land use and redevelopment opportunities. A complete summary of the outreach efforts can be found in the Appendix, Newport TSP Outreach Summary.

Common themes:

- Pedestrian and bicyclist safety throughout the City
- Increased bus/transit/shuttle options
- Interest in improving traffic flow and reducing congestion, for through travelers and local users
- Parking improvements, especially in the downtown area
- Traffic speeding enforcement
- Preserve/rebuild the Yaquina Bay Bridge in the same location
- Strong support for emerging technology such as electric vehicle (EV) charging stations, parking solutions and solar power

AUGUST 2021 WORKSHOP WHERE PEOPLE COULD TALK TO STAFF AND PROVIDE INPUT ON PROJECTS

TECHNICAL DEVELOPMENT

Figure 10 illustrates the technical tasks involved in updating the TSP. These are categorized in three major stages: the first to understand system needs and constraints, the second to develop solutions, and the third to prepare and adopt the plan. Community input guided the TSP development through all stages.

FIGURE 10: NEWPORT TSP DEVELOPMENT TECHNICAL TASKS

LEARN & UNDERSTAND

- Introduce project to stakeholders.
- Evaluate existing conditions and future growth trends.
- Discuss community values and transportation goals.
- Develop performance measures and evaluation.
- Coordinate with state and regional plans.

ANALYZE & EVALUATE

- Determine future conditions.
- Develop alternative solutions for all modes of travel.
- Evaluate and refine draft solutions with the community.

RECOMMEND / ADOPT

- Identify preferred alternatives.
- Develop draft plan for public review.
- Hold public meetings with city boards, commissions and council.
- City Council adopts TSP.

Chapter 3: Newport Today and Tomorrow

This chapter identifies the needs for the Newport transportation system. The needs reflect where the transportation system can better accommodate the desired activities of the community. Needs were determined based on a comprehensive multimodal existing conditions analysis and projecting future conditions through the planning horizon (2040) based on assumed growth in households and employment.

LAND USE AND TRANSPORTATION

Land use is a key component of transportation system planning. Where people live and where they go to work, shop, or access services has a big impact on how they get around and the demands they place on the transportation system.

Household and employment information is used as the basis for estimating future transportation activity in Newport. Figure 11, Figure 12, and Figure 13 summarize where household growth is expected, and Figure 14, Figure 15, and Figure 16 summarize where employment growth is expected through 2040 (see Technical Memorandum #6 in the Appendix for more information). High housing growth is concentrated around Newport's urban fringe including in northern Newport along US 101, Big Creek Park, Newport Middle School, in eastern Newport between US 20 and Yaquina Bay Road, and near the Oregon Coast Community College.

High employment growth is concentrated near Avery Street, the Lincoln County Fairgrounds, the Port of Newport, the South Beach area, Oregon Coast Community College, the Newport Airport, and the Holiday Beach area. Moderate employment growth is also expected along US 101 and in Newport's downtown area.

FIGURE 11: NEWPORT HOUSEHOLD GROWTH (NORTH MAP AREA)

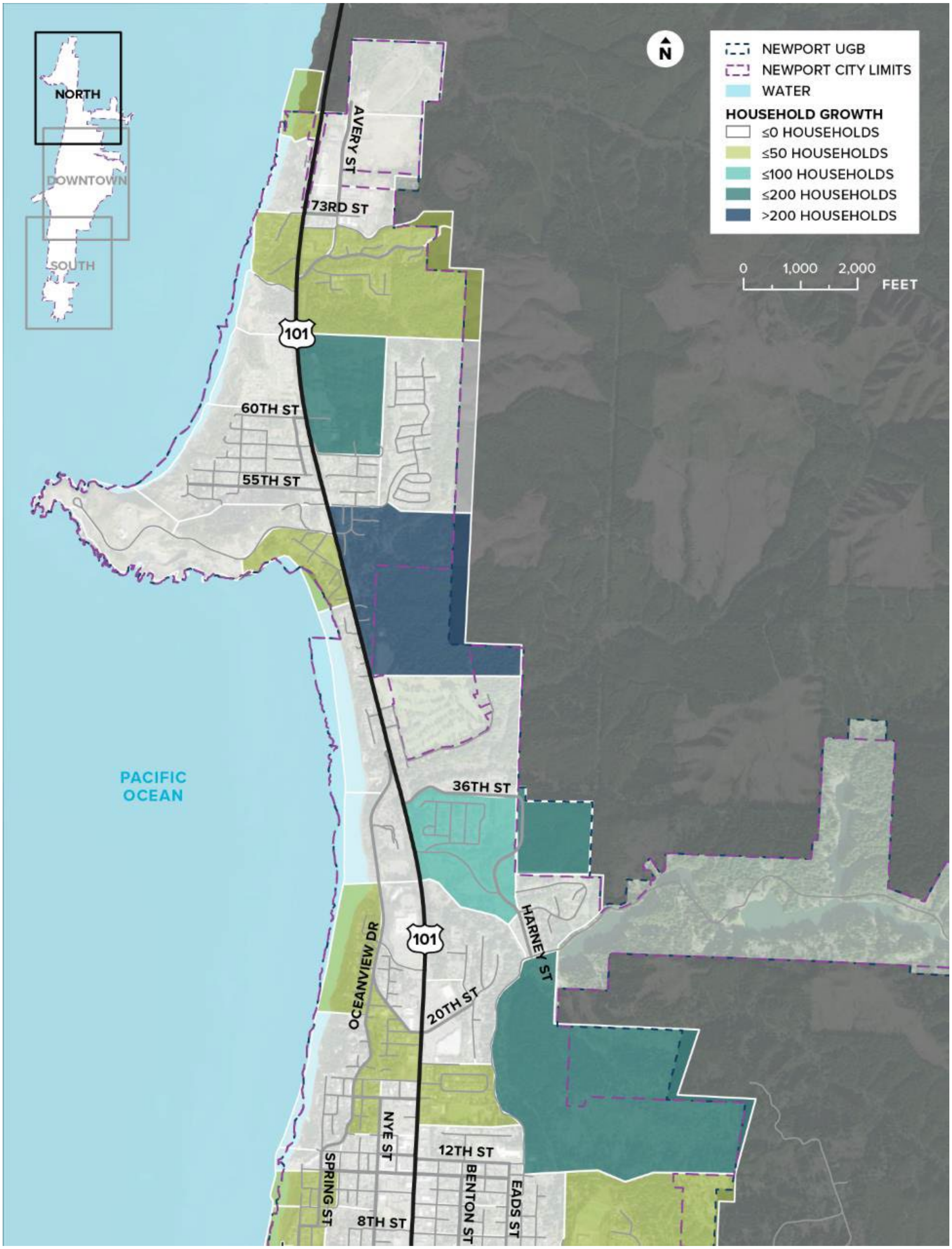


FIGURE 12: NEWPORT HOUSEHOLD GROWTH (DOWNTOWN MAP AREA)

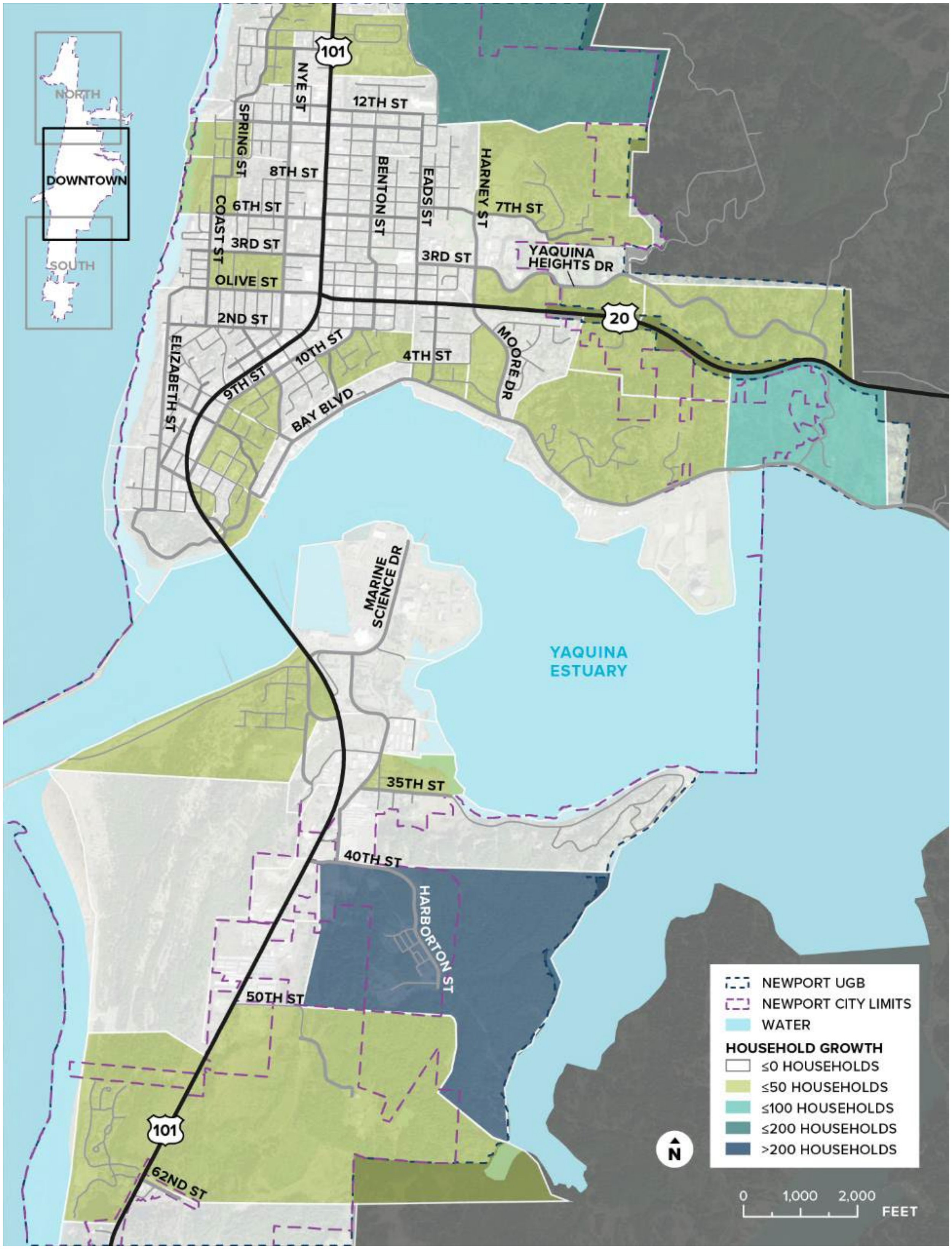


FIGURE 13: NEWPORT HOUSEHOLD GROWTH (SOUTH MAP AREA)

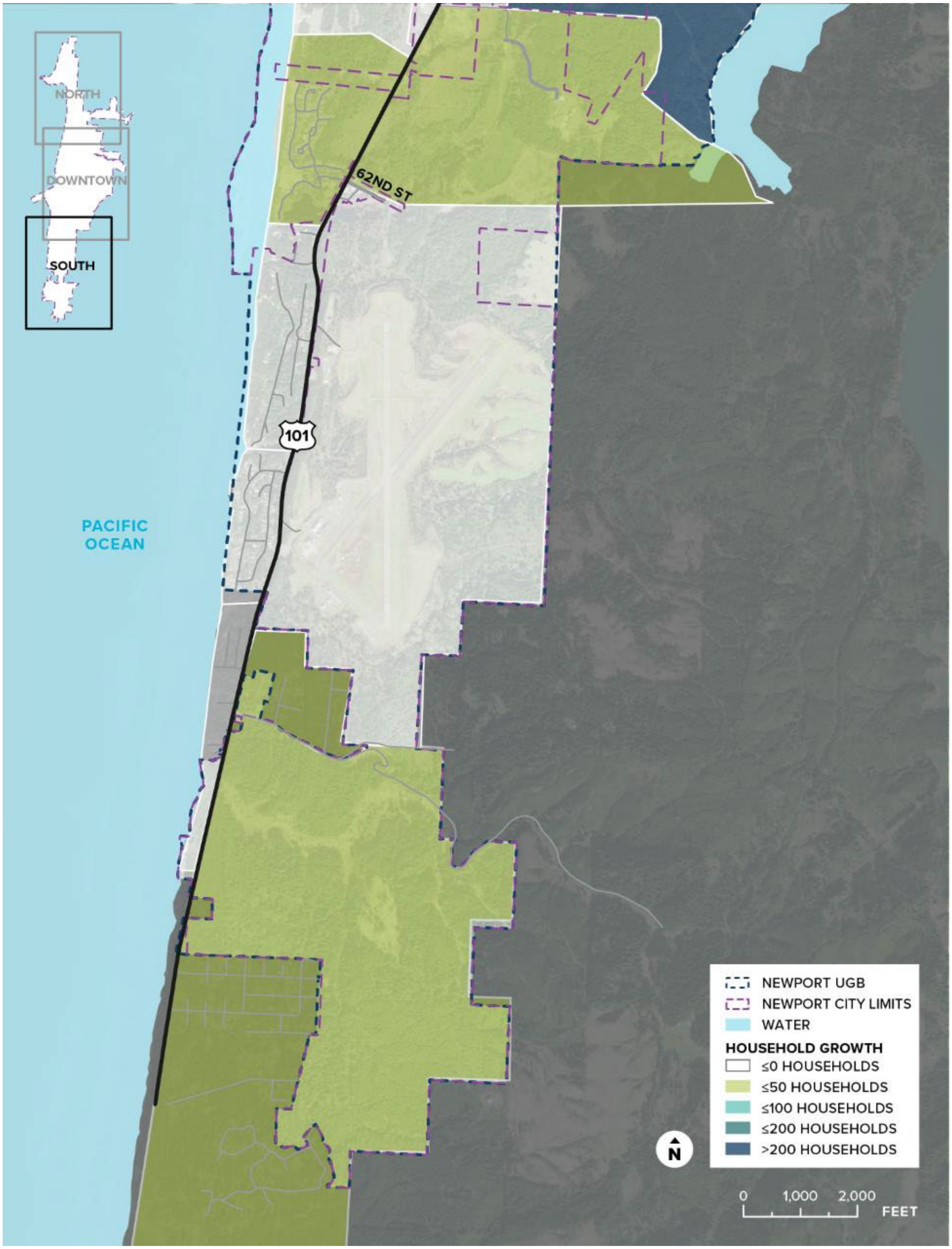


FIGURE 14: NEWPORT EMPLOYMENT GROWTH (NORTH MAP AREA)

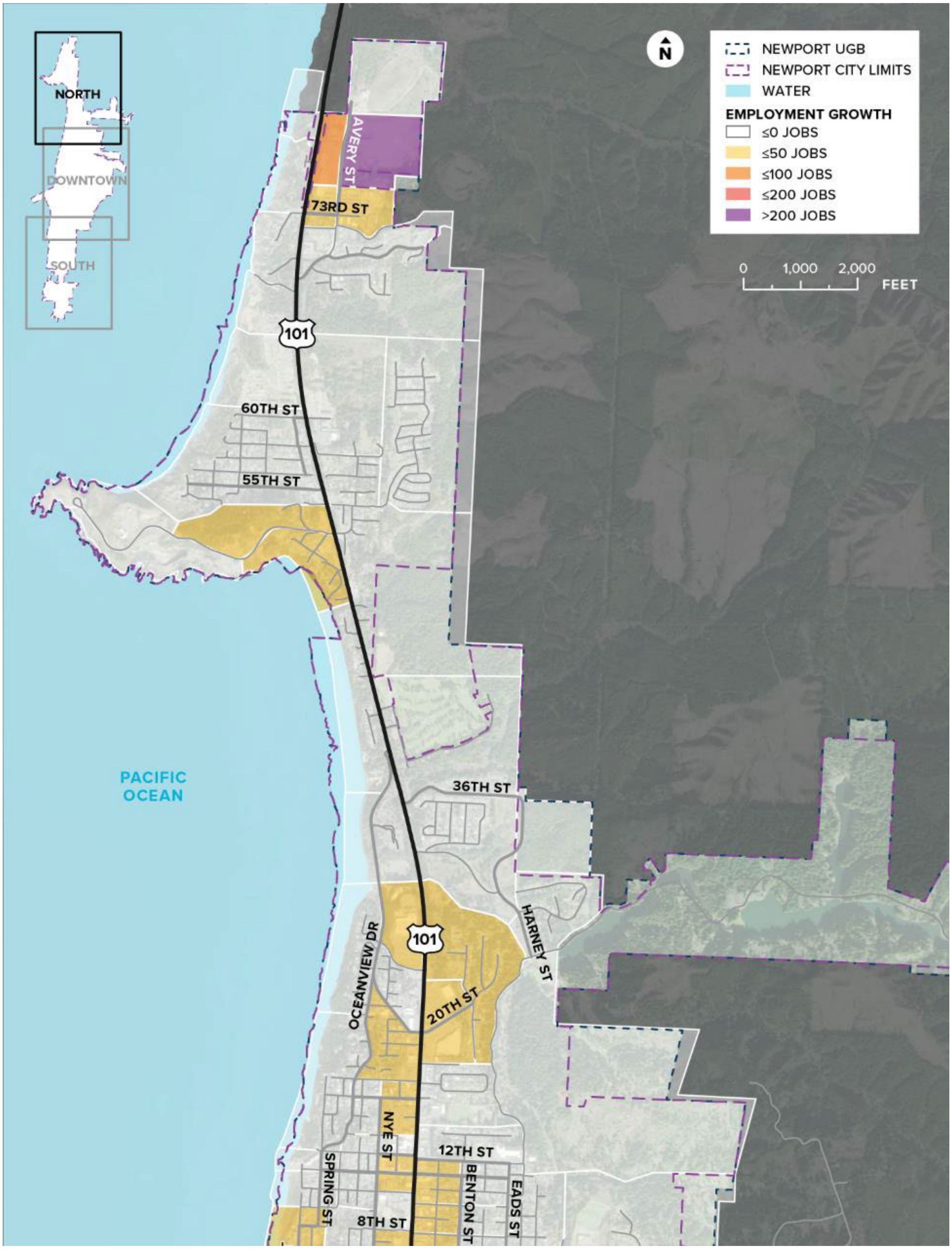


FIGURE 15: NEWPORT EMPLOYMENT GROWTH (DOWNTOWN MAP AREA)

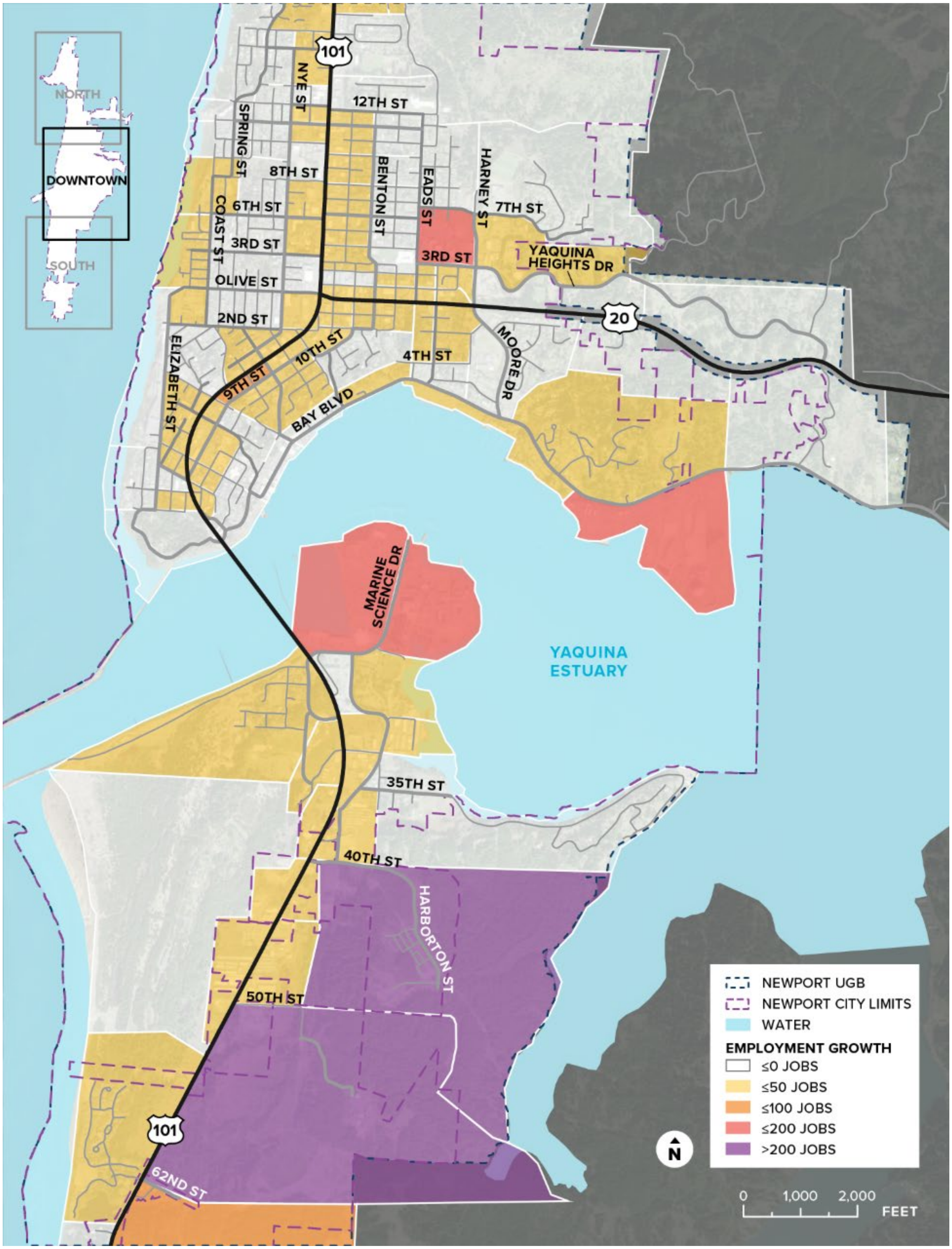
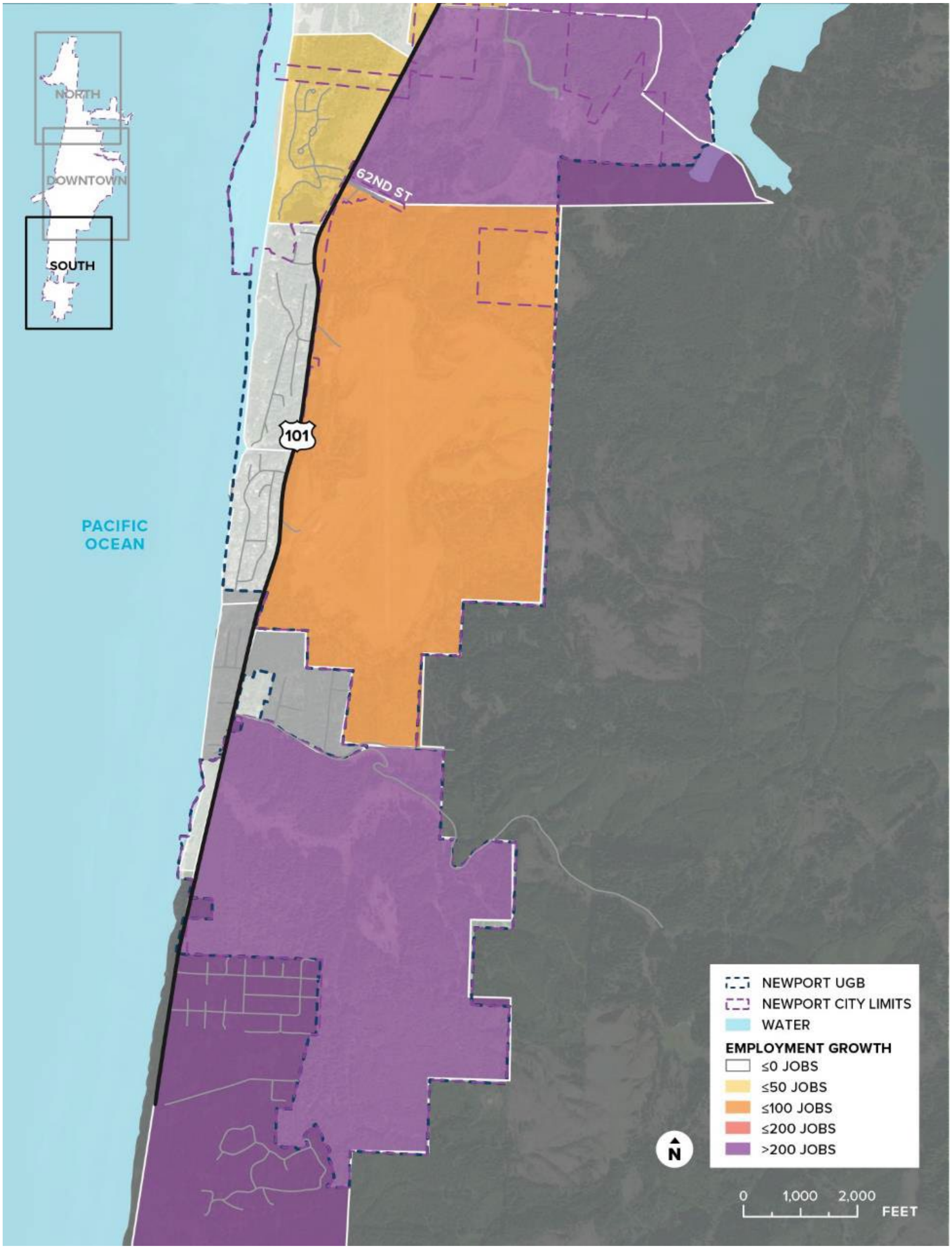


FIGURE 16: NEWPORT EMPLOYMENT GROWTH (SOUTH MAP AREA)

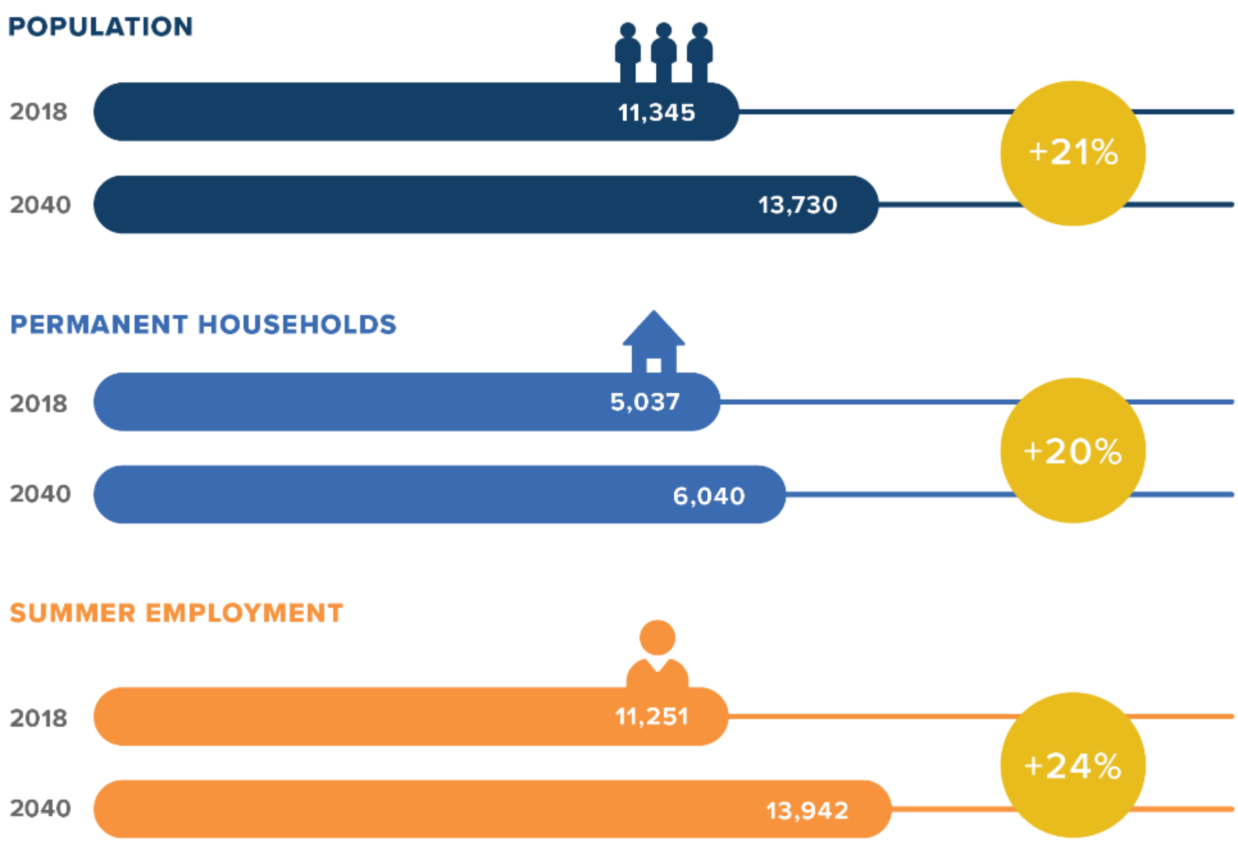


POPULATION, HOUSEHOLD AND EMPLOYMENT GROWTH

As growth continues to the year 2040, the demands on the City's transportation system will be influenced by changes in population, housing, and employment. These changes in travel demands will require better ways to manage the system, more choices for getting around, and targeted improvements to make the system safer and more efficient.

As shown in Figure 17, Newport is expected to add about 2,385 more people[1] living here by 2040. For travel forecasting purposes, the population and employment during the average summer weekday is used, which typically have higher levels than the off-season. In the City, for example, the population of 10,125 rises to 11,345 during that period. By 2040 that summertime population is expected to be 13,730. This includes an expected 1,003 new households by 2040, for a total of 6,040. Newport's current summertime average employment of 11,251 is estimated to increase to 13,942, with 2,691 more jobs in the UGB by 2040 (see Figure 17).

FIGURE 17: NEWPORT POPULATION, HOUSEHOLD AND EMPLOYMENT GROWTH TRENDS



SOURCE: NEWPORT TRAVEL DEMAND MODEL

[1] The 2017 Portland State University population forecast for Newport including its Urban Growth Boundary expansion was 2,385 more people. The 2021 PSU report showed a lower growth total of 547.

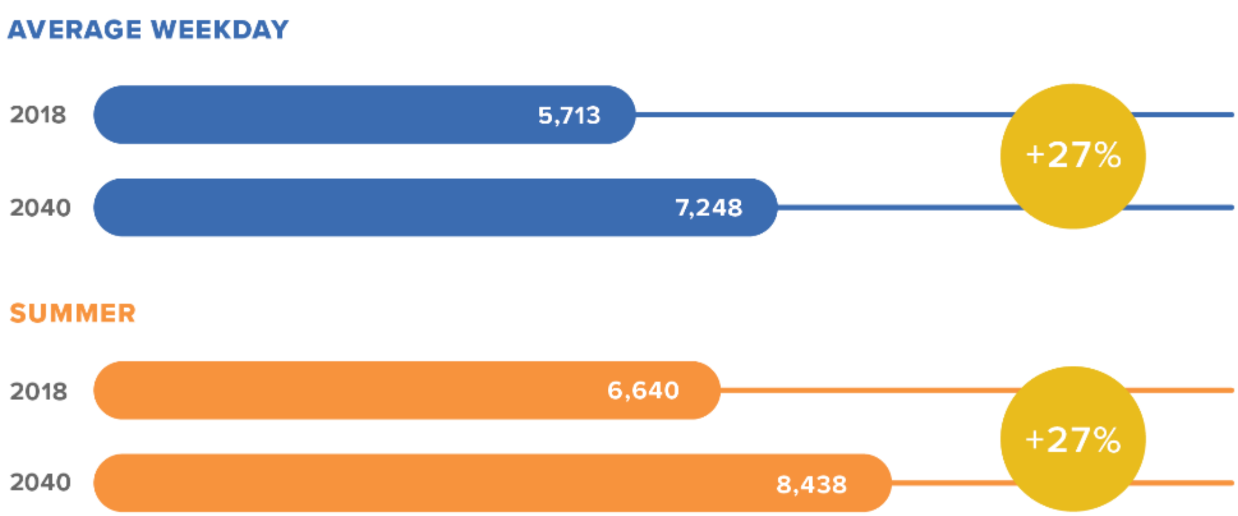
TRAVEL DEMANDS

The number of people who choose to walk, bike, ride transit or drive and the distances they travel is important for assessing how well existing transportation facilities serve the needs of users. Available data on travel mode choice, travel demand and trip length are used to better understand travel behavior in the community and inform the needs analysis for the transportation system.

Travel demands levels are influenced by the local housing and employment, seasonal visitors, and the amount of through traffic on the highway. Each of these components were considered in forecasting how current conditions in Newport will change by 2040. The increase in the number of local households and employees in the Newport UGB increases the overall number of trips generated. Figure 18 summarizes the total p.m. peak hour motor vehicle trip ends for the Newport UGB for year 2018 and year 2040. The number of vehicle trips is expected to grow by approximately 27 percent over this period if the land develops according to the land use assumptions during both an average weekday and the summer.

Being on the Oregon Coast, Newport is also impacted by a significant number of visitors and other regional travel on US 20 and US 101. This regional recreation-based travel significantly increases traffic volumes on these facilities in the summer months when compared to an average weekday. As shown in Figure 18, this tourism and recreational activity adds approximately 900 p.m. peak hour motor vehicle trip ends today (i.e., 5,713 during an average weekday versus 6,640 during the summer) and is expected to add 1,200 p.m. peak hour motor vehicle trip ends by 2040 within the Newport UGB, an increase of over 16 percent (i.e., 7,248 during an average weekday versus 8,438 during the summer).

FIGURE 18: NEWPORT VEHICLE TRIP ENDS (PM PEAK HOUR)



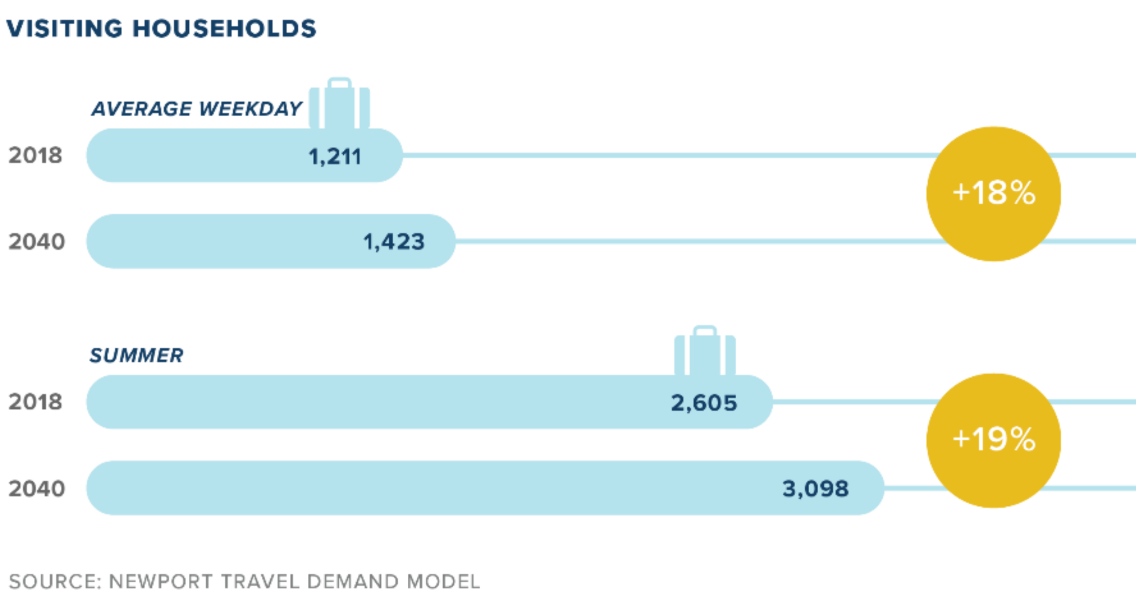
SOURCE: NEWPORT TRAVEL DEMAND MODEL

VISITING HOUSEHOLD TRIPS

Located within a two-hour drive from Albany, Corvallis, Eugene and Salem and a 3-hour drive from Portland, Newport is a desirable choice for getaways. Visitors arrive via US 20 and US 101 and often stay for extended periods, traveling to key attractions throughout the City. During the peak summer travel periods, more than 25,000 people may be in Newport at any time and motor vehicle volumes increase by as much as 45 percent on area roadways[2] compared to the winter months. These visitors are drawn to key lodging areas of the City including downtown, Nye Beach, Bayfront, South Beach and along US 101. Walking and biking is a popular travel choice for visitors among hotels or vacation rentals and the many destinations in the City, with most of the key lodging areas within a 30-minute walk or 10-minute bike ride north of Yaquina Bay. However, narrow sidewalks and lack of bike facilities on the Yaquina Bay Bridge creates a significant barrier for visitors to travel by these modes to tourist destinations located on the south side of Yaquina Bay.

Due to the importance of seasonal tourism on the Oregon Coast, the number of visiting households was also estimated. These visiting households stay in the City at area hotels and other short-term rentals. As shown in Figure 19, Newport is expected to accommodate 212 additional visiting households during an average weekday through 2040, from 1,211 today to 1,423 by 2040, an increase of 18 percent. As tourism increases during the summer, so does the number of visiting households. Today, the City accommodates 2,605 visiting households during the summer, or more than double the number during the average weekday. By 2040, Newport is expected to accommodate 493 additional visiting households during the summer, for a total of 3,098, an increase of 19 percent from today.

FIGURE 19: NEWPORT VISITING HOUSEHOLDS



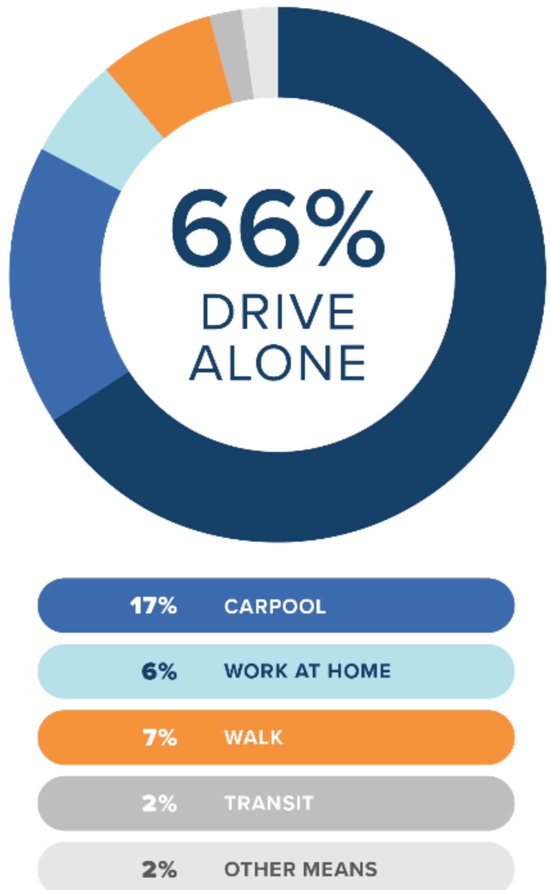
[2] Between January and August, average daily volumes on US 101 can vary by up to 45 percent of the annual average. In January, volumes are 20 percent below the annual average, and in August they are 25 percent above it.

COMMUTER TRIPS

Much of the traffic in Newport, especially during the more congested weekday peak periods, is related to employment. Approximately 70 percent of existing jobs in Newport are filled by people who live in another City[3]. Residents of Newport also contribute to travel between cities, with about 54 percent of employed residents commuting to employment locations outside of the City. Workers in Newport typically commute by single-occupant motor vehicle (about 66 percent), with about 7 percent of residents walking to work, and approximately 2 percent using transit (see Figure 20).

About 6 percent of employed residents in Newport worked from home pre-COVID, and that figure likely increased due to COVID-19. It is not yet known how many of those workers will continue to telework after the threat of COVID-19 passes, but it seems likely that a higher percentage of workers will continue teleworking, at least part time. Any increase in the remote work share will change the demand on streets. It is possible that we may see a decrease in the share of the workers that need to travel during the morning and evening peak commute times and may see an increase during off-peak times.

FIGURE 20: NEWPORT COMMUTER MODE SHARE



Source: US Census Bureau, 2015-2019 American Community Survey

COMMERCIAL ACTIVITY TRIPS

Area businesses also create demands on the transportation system. This includes customers purchasing goods and trucks servicing these businesses. Key areas of the City with commercial, retail or industry related activity includes downtown Newport, Port of Newport, historic Bayfront, Nye Beach, South Beach, and the US 101 and US 20 corridor. Residents within Newport's historic downtown core are typically within a five-minute drive, twenty-minute walk or seven-minute bike ride of these areas. Recent residential developments north of Agate Beach or in South Beach typically have limited neighborhood commercial opportunities and are located farther from Newport's historic downtown core which increases trip lengths and limits mode choices for residents of these areas. Trucks servicing these areas typically travel from major cities outside Newport and can travel over 60 miles from major distribution centers in the Willamette Valley and the I-5 corridor before using US 20 or US 101. Within Newport, freight traffic is common on US 101, US 20, Moore Drive, Bay Boulevard, and 73rd Street to serve the fishing industry, Port of Newport and businesses throughout Newport.

[3] US Census Bureau, OnTheMap. Home/Work Distance/Direction Analysis, 2018.

TRANSPORTATION SYSTEM FACTS

To address changing transportation needs within the UGB though 2040, the existing and future travel conditions were reviewed. The transportation system review documented the existing pedestrian, bicycle, transit, and motor vehicle infrastructure. It also identified shortfalls and limitations into how people can travel within the City (such as lack of bike lanes or sidewalks).

Figure 21 provides a summary of some of the existing transportation facilities in the City, with more details provided in the following sections. A complete summary of existing and future transportation conditions and needs can be found in Technical Memorandums #5 and #7 in the Appendix. Solutions for the transportation infrastructure that are determined to not maintain acceptable service levels for residents are identified in Chapter 6.

FIGURE 21: NEWPORT TRANSPORTATION SYSTEM FACTS

ROADWAY NETWORK

The existing transportation system in the UGB includes 89 miles of roadways. Two highways under State jurisdiction bisect the City, including US 101 and US 20. US 101 runs north-south through Newport, connecting coastal communities along the entire west coast of the United States, while US 20 runs east-west just north of the downtown area of the City, connecting it to Corvallis, Interstate 5 and eventually Boston, Massachusetts 3,365 miles to the east. These roadways intersect in the downtown area forming one of the most complex intersections in the City.

Key City streets that are adjacent to or intersect US 101 and US 20 include NE 73rd Street, NW 55th Street, Lighthouse/NE 52nd Street, NE 36th Street, NE Harney Street, SE Moore Drive, SE Bay Boulevard, SW Abalone Street, SE Marine Science Drive, SE Ferry Slip Road, 6th Street, SE 40th Street, Nye Street, Hurbert Street, Benton Street, and NW Oceanview Drive.

This TSP addresses vehicle speeds, vehicle flow, and safety for all users of streets in Newport. Traditionally, agencies have widened streets to respond to traffic congestion. But widening does not always work to reduce congestion in the long term. Widening is costly, has negative effects on adjacent properties, and makes the street even less safe and inviting for walking and biking. This TSP uses widening to add capacity as only the last option to respond to vehicle congestion issues. Instead, it generally emphasizes designing streets to slow vehicles and increase safety. The design of a street influences how a person drives more than the actual speed limit.

INTERSECTION OPERATIONS

Forecasted intersection operations were compared to currently adopted agency mobility targets to identify where significant congestion is likely to occur. Of the 20 study intersections, eight will not meet their respective mobility target during the 2040 design hour conditions. Nineteen of the study intersections met their mobility targets under existing conditions (2020); the intersection of US 101/US 20 is the only intersection that also exceeded its mobility target under existing PM peak hour conditions. All of the substandard intersections are on state highways and half are two-way stop control intersections. Increased traffic on US 101 will lead to excessive delay for left-turning traffic by 2040 at all unsignalized intersections, particularly during the summer peak.

Intersections that are expected to exceed mobility targets under the 2040 design hour conditions, include:

- US 101/73rd (stop controlled on side street)
- US 101/52nd (signalized intersection)
- US 101/Oceanview (stop controlled on side street)
- US 101/US 20 (signalized intersection)
- US 101/Angle (stop controlled on side street)
- US 101/Hurbert (signalized intersection)
- US 20/Benton (stop controlled on side street)
- US 20/Moore (signalized intersection)

Other Community Concerns

Additional intersection and roadway network concerns expressed by the community include congestion around NE Harney Street/SE Moore Drive due to school and County fairground traffic, limited access to the hospital from US 101, limited access and high delay travelling to and from residential neighborhoods whose only access is from US 101, irregular access alignments to US 101, such as near the Newport Theater and southbound vehicle speeds on US 101 approaching the Yaquina Bay Bridge as vehicles merge. In addition, several locations on US 101 were noted for challenges for pedestrians crossings, such as near NE 60th Street.

BRIDGES AND TUNNELS

There are 11 bridges and two tunnels within the Newport UGB. Nine of the bridges are along state highways (i.e., US 101 or US 20) and one is along a City roadway. The State Parks system also owns a pedestrian bridge and a pedestrian tunnel at Agate Beach State Park.

Three bridges are classified as structurally deficient with poor conditions, including:

- The bridge on US 101 over Big Creek, between NE 31st Street and NW 25th Street (maintained by ODOT)
- The Yaquina Bay Bridge (maintained by ODOT)
- The bridge on Big Creek Road over Big Creek, between NE Harney Street and NE 12th Street (maintained by the City of Newport)

Yaquina Bay Bridge

The Yaquina Bay Bridge is a key constraint for north-south travel in Newport both today and in the future. Existing narrow travel lanes, lack of shoulders, no bike lanes, and a steep grade all contribute to a lower carrying capacity compared to similar highway segments. Traffic volumes along the bridge (shown in Table 1) are forecasted to be around 20,000 during an average weekday, and around 22,000 during the summer, based on the projected local growth in the City, and growth in regional through traffic. This means that during both average weekday and summer conditions, the forecasted volumes are expected to exceed the capacity on the Yaquina Bay Bridge. As traffic volumes grow, this congestion could impact segments of US 101 approaching the Yaquina Bay Bridge or lead to additional congestion in off-peak hours without any mitigation.

TABLE 1: EXPECTED TRAFFIC VOLUMES ON THE YAQUINA BAY BRIDGE

SCENARIO	2018 AVERAGE DAILY TRAFFIC	2040 AVERAGE DAILY TRAFFIC	PERCENT GROWTH
AVERAGE WEEKDAY	14,200	19,800	39%
SUMMER	16,900	21,800	28%

Source: Technical Memorandum #7: Future Transportation Conditions and Needs, Table 3.

Like many coastal bridges, the Yaquina Bay Bridge is a designated historic structure. The ODOT Historic Bridge Preservation Plan details treatment options to extend the useful life of historic structures and maintain their original purpose. ODOT ensures that every reasonable effort is pursued to maintain transportation service for their historic bridges prior to other, more impactful decisions. The existing historic structural elements will be maintained to the maximum extent necessary, and any new elements must maintain the historical significance of the structure. Maintenance considerations could also include vehicle or load restrictions that limit traffic on historic bridges.

If in the future ODOT determines that the Yaquina Bay Bridge can no longer maintain its intended function, the bridge could be paired with a parallel crossing to lessen vehicle demands or converted to a new use. Only after these options are exhausted will ODOT consider a full closure of the bridge and replacement. All future decisions regarding the use of the Yaquina Bay Bridge will be coordinated with ODOT. This TSP recommends that the City coordinate with ODOT to prepare a Facility Plan (which would become a Refinement Plan to the TSP with City council support) for the Yaquina Bay bridge area to further clarify the alignment, cost, and impacts associated with a future replacement bridge project.

PARKING

US 101 and US 20 serves thousands of vehicle trips each day bringing many visitors and economic opportunities for the City, which also means large recreation vehicles or towing trailers traversing narrow and busy sections through the downtown area. This leads to conflicts with parked vehicles along US 101 due to the narrow travel lanes. In addition, the community has expressed concerns related to limited parking in tourist-oriented areas such as Nye Beach and the Bayfront, particularly during peak summer periods, and potential for parking spillover into the neighborhoods.

PEDESTRIAN NETWORK

Walking plays a key role in Newport's transportation network and planning for pedestrians helps the City provide a complete multimodal transportation system. It also supports healthy lifestyles and addresses a social equity issue ensuring that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, and education.

In this plan, "walking" and "pedestrian" are terms that include people who walk independently or use canes, wheelchairs, other walking aids, or strollers. As noted earlier in this TSP, approximately seven percent of commuters in the City walk to work, with two percent utilizing public transportation, which often includes walking at the beginning or end of the trip. In addition to the work commute trips, walking trips are made to and from recreational areas, shopping areas, schools, or other activity generators. Continuous and direct sidewalk connections to all activity generators and along all streets, in addition to safe crossing opportunities along major roadways, are essential to encourage walking and transit use.

The existing pedestrian network in the Newport UGB is composed of 33 miles of sidewalks, and about 10 miles of shared use paths or pedestrian trails. Curb ramps are available at about 80 percent of intersections along US 101 and US 20, but many of them are not compliant with the Americans with Disabilities Act. In addition, nearly 70 percent of streets lack a sidewalk on at least one side, including several segments of US 101 and US 20. Although there is generally good sidewalk coverage near downtown Newport, many of the residential areas of Newport were developed without sidewalks, and these sidewalk gaps will remain through 2040 without redevelopment or sidewalk infill projects as part of the TSP.

PEDESTRIAN LEVEL OF TRAFFIC STRESS

The pedestrian level of traffic stress[4] (LTS) evaluation provides a metric to understand a multimodal user's perception of the safety and comfort of the transportation network. This method was used to understand key gaps and barriers to walking to be addressed through targeted improvements in this TSP. In addition to the LTS evaluation, consideration was given to acknowledge cases where traffic volumes were expected to be very low, such as under 500 vehicles daily on a local or shared street. Feedback from the community indicated that under such conditions, residents were comfortable walking within the roadway given that the chance of vehicle conflicts are remote.

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[4] Refer to Technical Memorandum #5: Existing Conditions, page 3 for a complete definition of the Level of Traffic Stress. The LTS scale ranges from LTS 1(Low) to LTS 4(Extreme).

The LTS evaluation generates a ranking (i.e., low, moderate, high, or extreme stress) of the relative safety and comfort of a segment or intersection for pedestrians based on roadway and intersection characteristics (e.g., land use context, number of lanes, travel speed and volume, intersection control, type and width of buffer, and the presence and condition of any bicycle or pedestrian facilities). The LTS rating scale recognizes that as vehicle speeds and volumes increase, enhanced pedestrian facilities are needed to maintain a system that is accessible for all users.

A pedestrian walking along roughly 25 percent of the analyzed streets (i.e., arterial and collector roadways) within the UGB will experience a low or moderate level of stress. This is generally representative of streets with low volumes and speeds where sidewalks are provided. An extreme level of stress is experienced along 60 percent of the analyzed streets, mainly those with no sidewalks or buffers and the highest speeds and traffic volumes. This includes most of US 101 and US 20 through the UGB, streets that are important for pedestrian travel. Overall, the pedestrian network near downtown has a consistent set of continuous walkways which provides a low stress environment, and whereas towards the edges of the City and in residential areas many streets lack sidewalks or walkways such that travelers walk within the roadway. Where traffic volumes and speeds are higher, the absence of a dedicated walkway can create extreme stress on the traveler.

As redevelopment and frontage improvements occur through 2040, streets will be built to align with the standards outlined in Chapter 4 of this TSP. These standards require high-quality facilities, and an emphasis on safe, convenient, and comfortable travel, and contribute towards a network wide lower stress pedestrian experience.

Equally important is the pedestrian experience crossing streets. These locations are often when a pedestrian experiences some of the highest amount of stress, particularly along major streets with high travel speeds and traffic volumes. This TSP team looked at 20 intersections in the UGB. Sixteen of the intersections, including many of those along the busiest streets (i.e., US 101 and US 20), have a pedestrian stress level of extreme or high, while only four intersections that this TSP looked at have a low or moderate level of stress for pedestrians. In general, the studied interections lack ADA compliant curb ramps, have complex elements, or offer limited refuge or enhancements at the crossing.

METHODOLOGY USED TO IDENTIFY TSP PEDESTRIAN PROJECTS

The list of pedestrian network improvement projects shown in Chapter 6 was developed based on streets with pedestrian deficiencies. The solutions for these deficiencies were selected to support the overall goals and objectives of the TSP. For pedestrian projects that is primarily related to improvements that deliver safer, more accessible, and convenient facilities.

A street is considered deficient for walking if it meets one or more of the following conditions:

- **Sidewalk Gaps**
  Arterial or collector street segment without pedestrian facilities.
- **Pedestrian Level of Traffic Stress**
  Arterial or collector street segment with an extreme pedestrian level of stress.
- **Pedestrian Level of Traffic Stress near important Destinations**
  High or extreme pedestrian level of stress near parks, schools, transit stops, or other important destinations.

BICYCLE NETWORK

Bicycling is important for both transportation and recreation in Newport. This includes people who bike to work and school, people biking for fun, or people just running errands by bike. Riding bicycles also plays a key role in the transportation system's ability to support healthy and active lifestyles, with suitable facilities that provide a viable alternative to the automobile. While walking tends to be a competitive choice for trips under half a mile, bicycling tends to be suited for longer trips. Bicycle trips can often work well for distances between a half mile and three miles. Newport's relatively compact size makes biking a great choice for many trips, with local jobs and housing, in addition to hotels and other tourism destinations, typically in bikeable proximity.

This TSP includes projects to provide continuous bicycle connections between activity generators and arterial/collector roadways that are essential for safe and attractive non-motorized travel options. It includes bicycle infrastructure that appeals to a wider range of people, both in age and ability. Many people want to bike, but they find riding near traffic in standard bike lanes stressful and a deterrent. This TSP includes a bicycle network of streets with facility standards designed to minimize interactions between people on bikes and car traffic (see Chapter 4 of this TSP).

The bicycle network in Newport is composed of two lane miles of bike lanes, four miles of streets with shared lane markings and one mile of shared-use pathways. Bike lanes are currently striped along portions of US 101 near the NE 52nd Street/NW Lighthouse Drive intersection and SW Naterlin Drive, and on US 101 from the bridge south to the former intersection of SE Ferry Slip Road. Sharrows are currently located along portions of NW Oceanview Drive, NW Spring Street, NW Coast Street, SW Elizabeth Street, NW-NE 6th Street and SW Naterlin Drive. However, many of the existing facilities are not continuous. In addition, nearly 90 percent of arterial streets currently lack bike facilities, including much of US 101 and US 20. Critical gaps existing across the Yaquina Bay Bridge, along the NW Oceanview Drive corridor and the Oregon Coast Bike Route.

BICYCLE LEVEL OF TRAFFIC STRESS

The bicycle level of traffic stress (LTS) evaluation provides a metric to understand a multimodal user's perception of the safety and comfort of the transportation network. This method was used to understand key gaps and barriers to biking to be addressed through targeted improvements in this TSP.

The LTS evaluation generates a ranking (i.e., low, moderate, high, or extreme stress) of the relative safety and comfort of a segment or intersection for bicyclists based on roadway and intersection characteristics (e.g., land use context, number of lanes, travel speed and volume, intersection control, type and width of buffer, and the presence and condition of any bicycle or pedestrian facilities). The LTS rating scale recognizes that as vehicle speeds and volumes increase, enhanced bicycle facilities are needed to maintain a system that is accessible for all users.

A bicyclist riding along roughly 15 percent of the analyzed arterial roadways and 90 percent of the analyzed collector roadways within the UGB will experience a low or moderate level of stress. This is generally representative of the many low volume and speed streets of the highway. Even still, an extreme or high level of stress is experienced along 85 percent of the analyzed arterial roadways and 10 percent of the analyzed collector roadways, mainly those with no bicycle facilities and the highest speeds and traffic volumes. This includes the extent of US 101 and US 20 through the UGB, and short segments of NE Harney Street, NE 31st Street, NE Yaquina Heights Drive, SE Bay Boulevard and SE Ferry Slip Road. These streets are important for bicycle travel as they connect to most businesses and services and in many cases provides the only through route for cyclists (e.g., the Yaquina Bay Bridge). NW Oceanview Drive, a component of the Oregon Coast Bike Route, was rated at extreme level of traffic stress between US 101 and the intersection with NW Edenview Way, and medium level of traffic stress from there to Spring Street.

As redevelopment and frontage improvements occur through 2040, streets will be built to align with the standards outlined in Chapter 4 of this TSP. These standards require high-quality facilities, and an emphasis on safe, convenient, and comfortable travel, and contribute towards a network wide lower stress bicycle experience. For very low traffic volume conditions on local streets, consideration was given to allow for bicycling to be done within the roadway with designations for sharing the road when separate bikeway facilities are not available. This same shared street treatment was applied for pedestrian travel in the previous section for very low traffic conditions.

Equally important is the bicycle experience crossing streets. This TSP looked at 20 intersections in the UGB, of which 15 have a bicycle stress level of low or moderate. These are mainly at signalized intersections along US 101 or US 20, or at locations with low vehicle travel speeds and narrow crossing widths for cyclsits. Five unsignalized intersections along US 101 have a bicycle stress level of extreme or high. In general, these intersections are in locations with high vehicle travel speeds and wider crossing widths for cylists.

METHODOLOGY USED TO IDENTIFY TSP BICYCLE PROJECTS

The list of bicycle network improvement projects shown in Chapter 6 were developed based on streets with bicycle deficiencies. The solutions for these deficiencies were selected to support the overall goals and objectives of the TSP. For cycling projects that is primarily related to improvements that deliver safer, more accessible, and more convenient facilities such as dedicated bike lanes and multi-use pathways.

A street is considered deficient for bicycling if it meets one or more of the following conditions:

- **Bicycle Facility Gaps**

  Arterial or collector street segment without bicycle facilities or adjacent corridor with bicycle facilities.
- **Bicycle Level of Traffic Stress**

  Arterial or collector street segment with an extreme bicycle level of stress.
- **Bicycle Level of Traffic Stress near important Destinations**

  High or extreme bicycle level of stress near parks, schools, transit stops, or other important destinations.

TRANSIT

Transit service is provided in Newport via a city loop service, an intercity service, and an Americans with Disabilities Act (ADA) paratransit service. All Lincoln County Transit buses are equipped with a lift to allow wheelchair access and include bicycle racks. Riders are permitted to load their bicycle inside the bus only if the bike racks are full.

The Newport city loop completes a full loop through Newport six times each day, seven days a week, and in the evening, there is an additional southbound run to City Hall. This route has 41 bus stops, providing access to key destinations within Newport including grocery stores and other shopping, restaurants, local hotels and residences, Newport City Hall, post office, Oregon Coast Aquarium, NOAA facilities, and Nye Beach. The bus stops offer limited amenities, and many are unmarked, making the transit system challenging to navigate, particularly for visitors who may be unfamiliar with it. Most Newport residents are within a half mile of a transit stop, and in the downtown core, most residents are within a quarter mile of a transit stop. Long headways (up to 90 minutes) and limited service hours (approximately between 7 am and 5 pm) for the Newport city loop transit service limits the utility of this service for residents and visitors. In addition, transit service is not currently provided south of SE 50th Avenue.

The intercity transit service operates routes to Corvallis and Albany four times each day, to Lincoln City four times each day, to Yachats four times each day, and to Siletz six times a day between Monday and Saturday.

Lincoln County Transit also provides curb to curb coordinated and accessible dial-a-ride transit service that is available to everyone in Newport. The paratransit service, in wheelchair lift equipped minibuses, is available generally between 8:00 a.m. and 3:30 p.m. Monday through Friday.

TRANSIT DEVELOPMENT PLAN

Lincoln County's Transit Development Plan will guide future changes to transit service. Identified changes through 2028 include:

- Add additional stops at Newport's Walmart and Fred Meyer as part of the Newport-Siletz route
- Add up to four additional daily runs on the Coast to Valley route which serves Corvallis and Albany and coordinate these runs to better align with work or Amtrak schedules
- Increase frequency up to 50 percent on weekdays and weekends for the Newport-Lincoln City Route
- Add additional stops at the Oregon Coast Community College as part of the Newport-Yachats route
- Extend Dial-A-Ride service hours and provide service seven days a week
- Modify the Newport City Loop route to remove the Nye Beach and Bayfront and maintain existing 90-minute headways
- Add a new Newport City Loop route which serves Fred Meyer, Nye Beach, City Hall, Bayfront, and Embarcadero with 45-minute headways
- Add a new Newport City Loop route which serves Nye Beach, City Hall, Bayfront, and Embarcadero with 30-minute headways

These transit enhancements were identified by Lincoln County Transit to address the most significant unmet needs within their transit system. Further investments will be coordinated with Lincoln County Transit. The recommended enhancements address several public concerns made during this TSP process related to transit access. Specific comments noted the need for additional stops, more bus shelters, and added tourist shuttles.

In addition, these enhancements also align with several of the goals and objectives of this TSP, including:

TSP Goal 2: Mobility and Accessibility

- Support expansions of the local and regional transit network and service
- Support transportation options and ease of use for people of all ages and abilities

TSP Goal 7: Prepare for Change

- Seek to supplement traditional transportation options with more emphasis give in to walking, biking, and transit

TSP Goal 9: Work with Regional Partners

- Build support with regional partners for the improvement of regional connections

FREIGHT NETWORK

US 101, north of US 20, is a designated federal truck route and US 20, east of US 101, is a designated Oregon freight route. As a designate truck route, the section of US 101 north of US 20 is also identified as a Reduction Review Route, which means that any improvements within the highway right-of-way needs to consider its impact of freight truck carrying capacity. In addition, about 8.5 miles of roadways are located adjacent to or connecting to industrial lands. These roadways include portions of NE Avery Street and NE 73rd Street at the north end of the City, SE Moore Drive and Bay Boulevard in the central part of the City, and US 101, SE 35th Street, SE 40th Street, SE 50th Street and SE Ferry Slip Road at the south end of the City.

With growing traffic volumes, five intersections along Oregon Freight Routes or Federal Truck Routes would not meet their currently adopted mobility target during the 2040 design hour conditions. These intersections are shown below.

Intersections that might experience increased freight delay through 2040:

- US 101/73rd (stop controlled on side street)
- US 101/52nd (signal)
- US 101/US 20 (signal)
- US 20/Benton (stop controlled on side street)
- US 20/Moore (signal)

Note: Refer to Future Transportation Conditions and Needs, Technical Memo #7, for more information in the Appendix.

Although all these intersections are on a designated freight route, two of the intersections are two-way stop control where the side street will experience significant delay in the future. Since freight traffic is concentrated on US 101 and US 20 in Newport, high side-street delay at the US 20/Benton intersection will likely have a minimal impact to freight. However, 73rd Street serves an industrial area which can generate high freight traffic, and increased side street delay at this location will negatively impact freight operations. High vehicle delay at the other three traffic signals will also increase delay for freight travel through Newport on US 101 or US 20.

Other locations with identified freight needs include Bay Boulevard and the Yaquina Bay Bridge. Bay Boulevard is a working waterfront and is a key freight generator for the City of Newport. This area is also a tourist destination which can create conflicts between the high volume of pedestrians, passenger cars, and freight vehicles which serve Newport's fishing industry. Freight vehicles can also struggle to navigate the steep grades for northbound traffic approaching the Yaquina Bay Bridge. The recent relocation of the traffic signal from SE 32nd Street to SE 35th Street has improved this operational issue for freight vehicles. In addition, as noted previously, the Yaquina Bay Bridge has weight limit restrictions which directs heavier freight vehicles to reduce their loads below the maximum levels to comply, which increases the amount of truck activity along this segment of the highway.

AIRPORT

The Newport Municipal Airport, owned and operated by the City of Newport, is a public-use airport located east of US 101 off SE 84th Street, approximately five miles south of downtown. This airport provides general aviation for Newport and surrounding coastal communities and is identified as a critical resource by the Oregon Department of Aviation for emergency response following a major earthquake or tsunami. Currently, the airport supports general aviation aircrafts, US Coast Guard helicopters, and air ambulance flights.

The airport currently supports 28 based aircraft. Other services and facilities include: hangars, tie-downs, fueling, and rental cars. The airport has two runways, and serves 19,600 annual operations (i.e., take-offs or landings).

Regional and international air service for passengers and freight is provided via Portland International Airport (PDX). The airport is located approximately 140 miles (over three hours) northeast of Newport. Eugene Airport located approximately 80 miles (or 90 minutes) southeast of Newport also provides regional air service.

WATERWAYS

Newport is bounded to the west by the Pacific Ocean and is divided north-south by Yaquina Bay, a commercially navigable waterway. Yaquina Bay is a 30-foot deep basin and 300 feet across at its narrowest point; at high water, there is 129 feet of vertical clearance under the Yaquina Bay Bridge.

The Port of Newport maintains and operates separate commercial and recreational marinas to serve Newport’s ship traffic. The commercial marina, located on the north side of Yaquina Bay, south of Bay Boulevard includes four docks for commercial vehicles and serves a large, prolific fishing fleet and a yacht club. This marina can accommodate vessels up to 100 feet. Marine supplies and a customs office are available for patrons. The recreational marina is located on the south side of Yaquina Bay, near South Beach, with space for 522 vessels and includes power, water, fuel, and sanitary services as amenities. This marina also serves as a public boat launch with space for trailer storage.

The Newport International Terminal provides two berths for cargo ships, research vessels, cruise ships, and fishing boats on the north side of Yaquina Bay. This terminal is one of three deep draft ports on the Oregon Coast and has traditionally been used to ship timber products. NOAA also maintains a marine operations center to the south of Yaquina Bay and serves as the home port for two research vessels in addition to supporting five ships.

Chapter 4: System Design & Management Principles

Newport applies transportation standards and regulations to the construction of new transportation facilities and to the operation of all facilities to ensure that they are designed appropriately and that the system functions as intended. These standards enable consistent future actions that reflect the goals and objectives of the City.

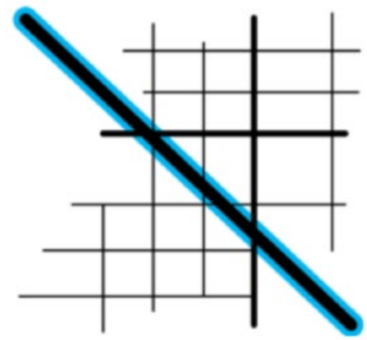
FUNCTIONAL CLASSIFICATION

Functional classification for streets helps support the movement of vehicles and 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 form a network that serves travel needs on a regional, citywide, neighborhood and local level. By designating the management and design requirements for each roadway classification, this hierarchal system supports a network of streets that perform as desired.

The street functional classification system for roadways in the Newport is described below. The functional classification map (Figure 22, Figure 23, and Figure 24) shows the designated classification for all roadways in the City, including new street extensions proposed as part of this plan. From highest to lowest intended use, the classifications are arterial, major collector, neighborhood collector, and local streets. For a summary of functional classification changes from the prior TSP, see Technical Memorandum #10: Transportation Standards, in the appendix.

The federal government also has a functional classification system that is used to determine federal aid funding eligibility. Roadways federally designated as a minor collector (urban), major collector, minor arterial, principal arterial, or interstate are eligible for federal aid. Newport’s functional classification system uses the similar designations as the federal government (e.g., a City designated arterial is intended to be the same as a federally designated principal arterial, a City designated major collector is intended to be the same as a federally designated major collector, and a City designated neighborhood collector is intended to be the same as a federally designated urban minor collector). Future updates to the federal functional classification system should incorporate the designations reflected in the TSP along City roadways.

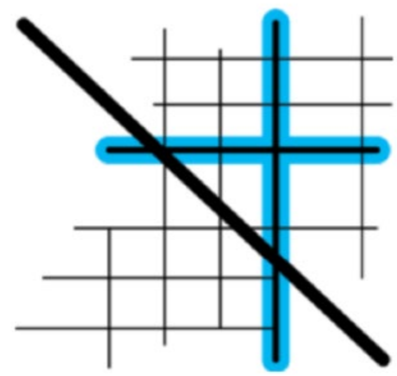
ARTERIAL STREETS



Arterial streets are primarily intended to serve regional and citywide traffic movement. Arterials provide the primary connection to other arterial streets or collector streets. Safety should be the highest priority on arterial streets and separation should be provided between motor vehicles and people walking, and bicycling. Safe multimodal crossings should also be provided to key destinations. Where an arterial street intersects with a neighborhood collector or local street, access management and/or turn restrictions may be employed to reduce traffic delay. The only arterial streets in Newport are US 101 and US 20, which also include a Federal Classification of urban other principal arterial.

MAJOR COLLECTOR STREETS

Major collector streets are intended to distribute traffic from arterial Streets to streets of the same or lower classification. They provide both access and circulation within and between residential and non-residential areas. Major collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access (compared to arterials) and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system. Safety should be a high priority on major collectors. Where a major collector street intersects with a neighborhood collector or local street, access management and/or turn restrictions may be employed to reduce traffic delay.



NEIGHBORHOOD COLLECTOR STREETS

Neighborhood collector streets distribute traffic from arterial or major collector streets to local streets. They are distinguishable from major collectors in that they principally serve residential areas. Neighborhood collector streets should maintain slow vehicle operating speeds to accommodate safe use by all modes and through traffic should be discouraged, especially in areas with topography or other line of sight constraints. Where a neighborhood collector street intersects with a higher-classified street, access management and/or turn restrictions may be employed to reduce traffic delay and discourage through traffic.

LOCAL STREETS

All streets not classified as arterial, major collector, or neighborhood collector streets are classified as local streets. Local streets provide local access and circulation for traffic, connect neighborhoods, and often function as through routes for pedestrians and bicyclists. Local streets should maintain slow vehicle operating speeds to accommodate safe use by all modes.

Private Streets

Private streets are a special type of local street that are used to facilitate access to specific properties or small neighborhoods. Private streets can include driveways or private roadway connections that serve four or fewer parcels. The City is not responsible for maintenance on private streets.

FIGURE 22: FUNCTIONAL CLASSIFICATIONS (NORTH MAP AREA)

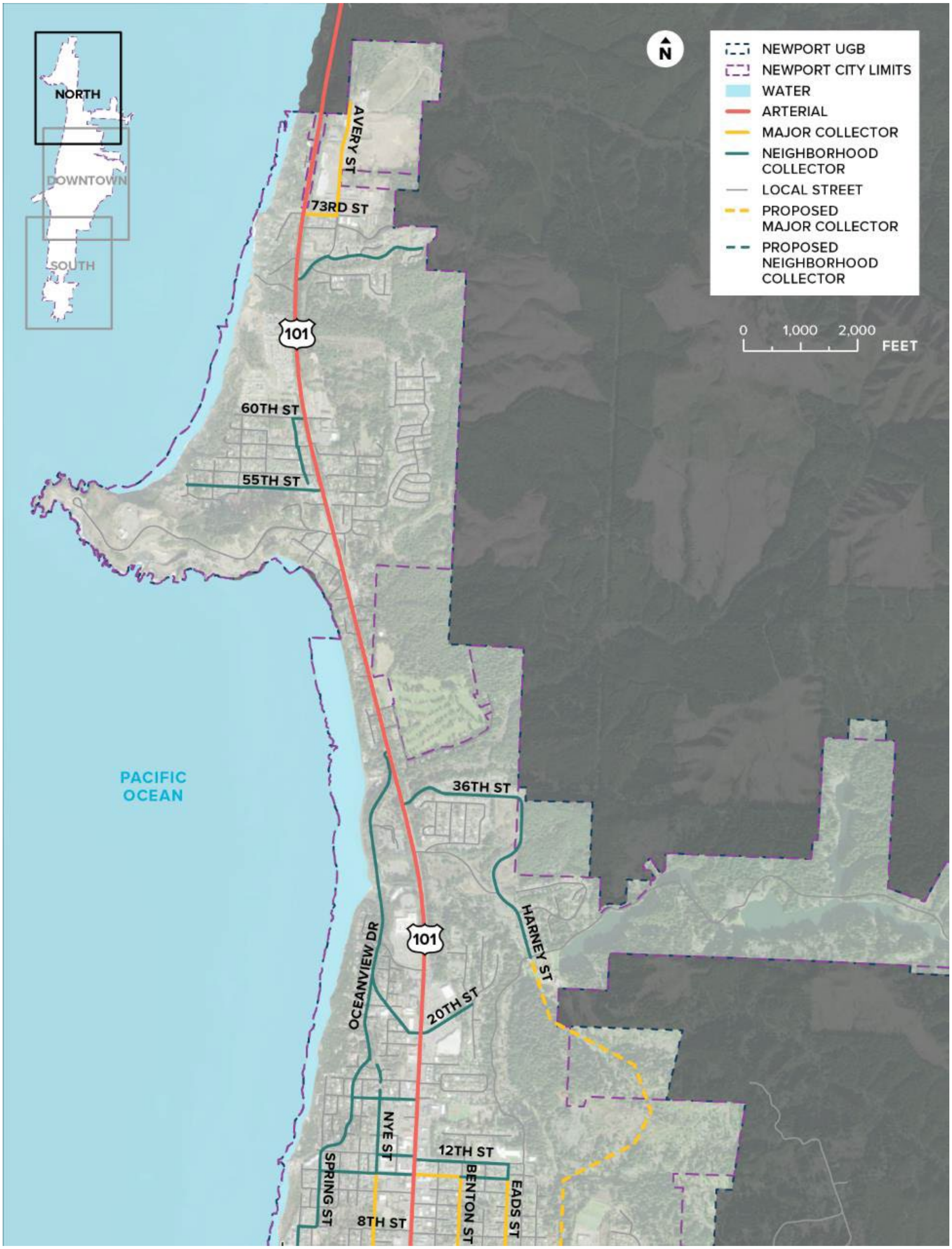
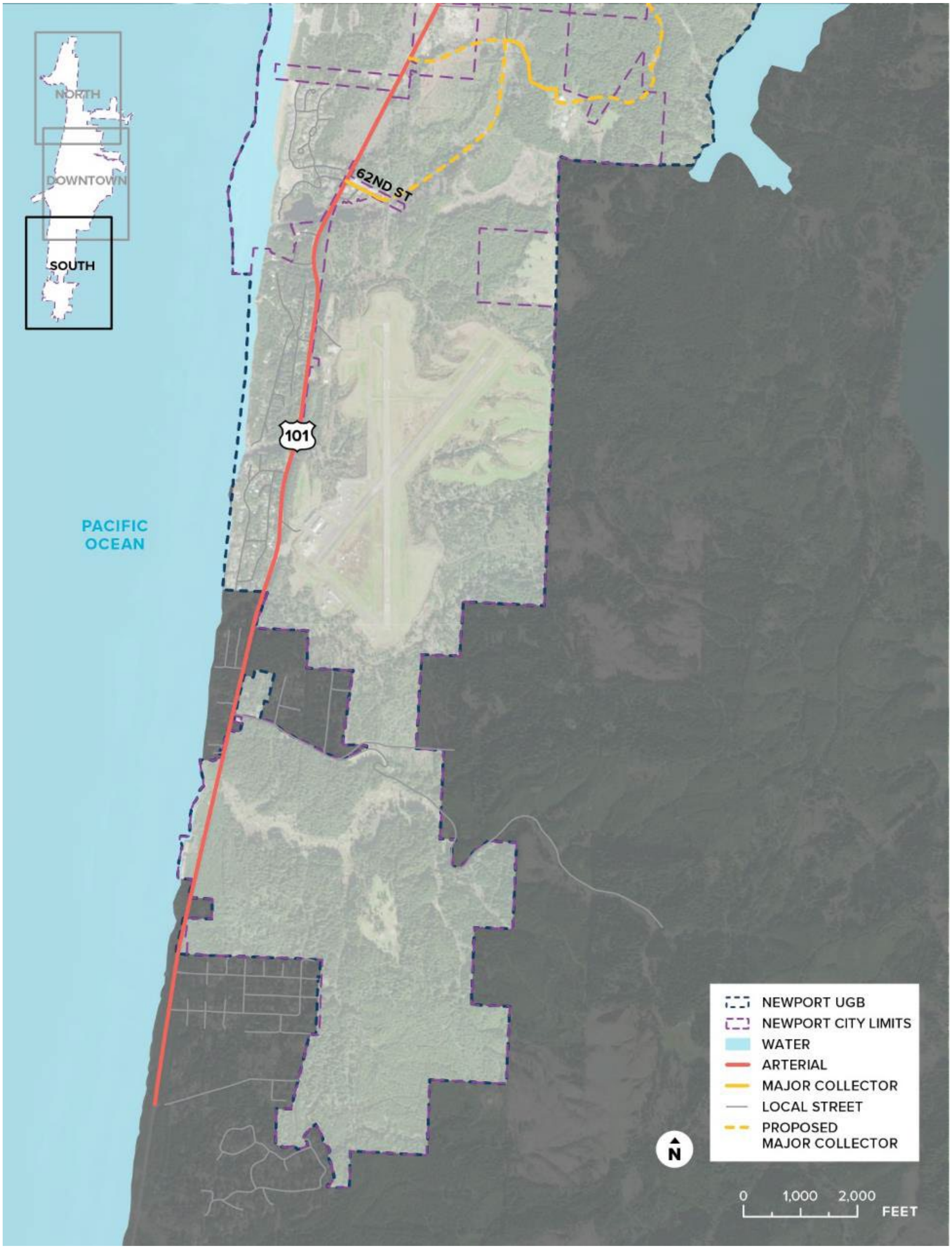


FIGURE 23: FUNCTIONAL CLASSIFICATIONS (DOWNTOWN MAP AREA)

FIGURE 24: FUNCTIONAL CLASSIFICATIONS (SOUTH MAP AREA)



FREIGHT AND TRUCK ROUTES

Figure 25, Figure 26, and Figure 27 show roadways designated to help ensure trucks can efficiently travel through and access major destinations in Newport. These routes play a vital role in the economical movement of raw materials and finished products, while maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system.

STATE AND FEDERAL FREIGHT ROUTES

Newport currently has two designated statewide freight routes. US 101 (north of US 20) is a National Network freight route while US 20 is a designated freight route in the Oregon Highway Plan (OHP). The National Network designates a set of highways based on geometric specifications (e.g., travel lane width) specifically for use by large trucks while the OHP identifies freight routes based on the tonnage carried. Both of these corridors are also identified freight reduction review routes that requires the Mobility Advisory Committee to review and approve proposed changes to any reduction in the vehicle carrying capacity of these routes. US 101 south of US 20 is not a National Network freight route, OHP freight route, or reduction review route.

LOCAL TRUCK ROUTES

The City has local truck routes designed to facilitate the movement of truck freight between local industrial and commercial uses and state highways. These roadways serve an important role in the City roadway network and should be designed and managed to safely accommodate the movement of goods. These routes require a minimum of 11-foot travel lanes.

The local truck network, shown in Figure 25, Figure 26, and Figure 27, includes NE 73rd Street, NE Avery Street, NE 36th Street, NE Harney Street, SW/E Bay Boulevard, SE Moore Drive, Yaquina Bay Road, US 101 (south of US 20), SE Marine Science Drive, SE Ferry Slip Road, SE 35th Street, and the future extensions of SE 50th Street and SE 62nd Street.

FIGURE 25: FREIGHT AND TRUCK ROUTES (NORTH MAP AREA)

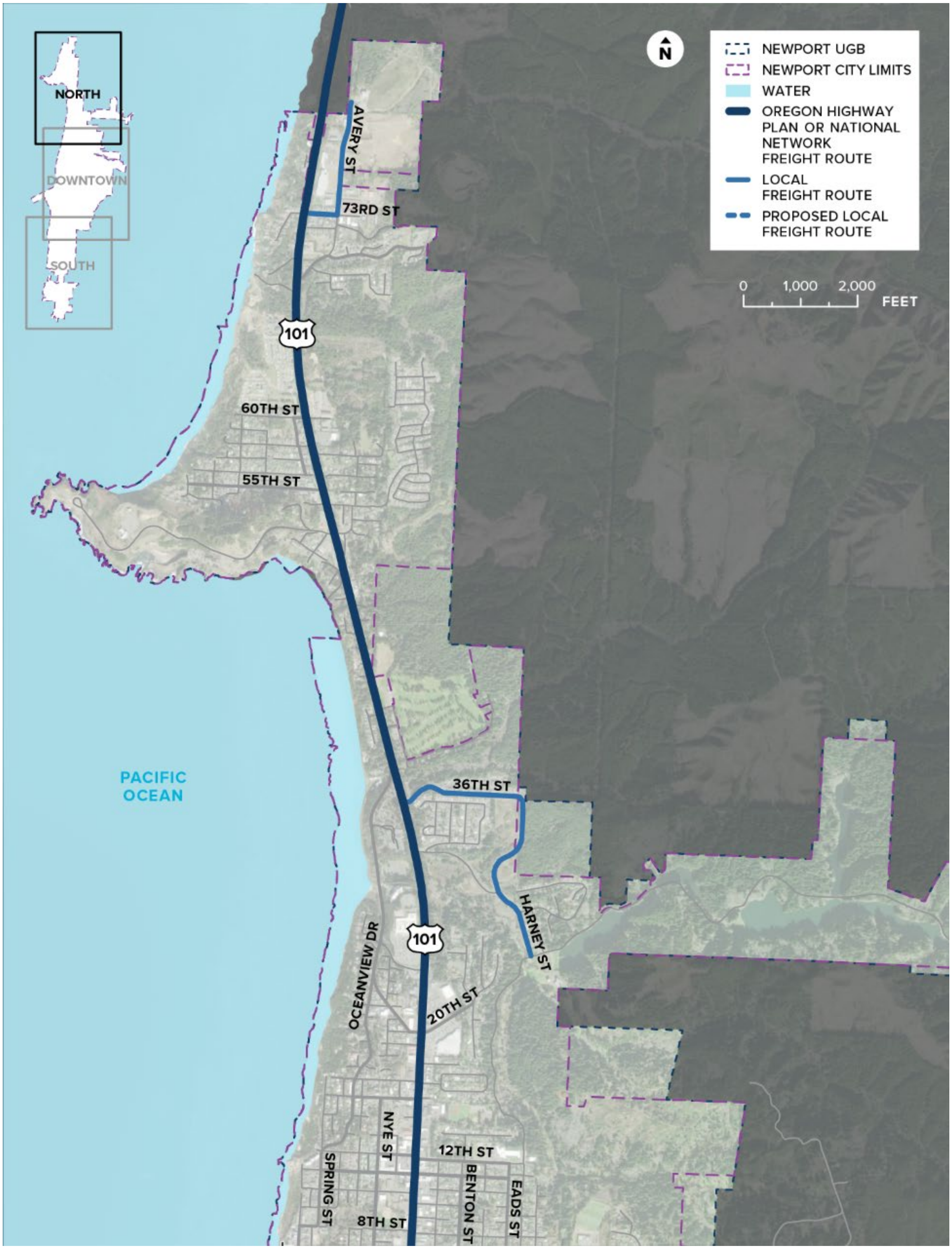


FIGURE 26: FREIGHT AND TRUCK ROUTES (DOWNTOWN MAP AREA)

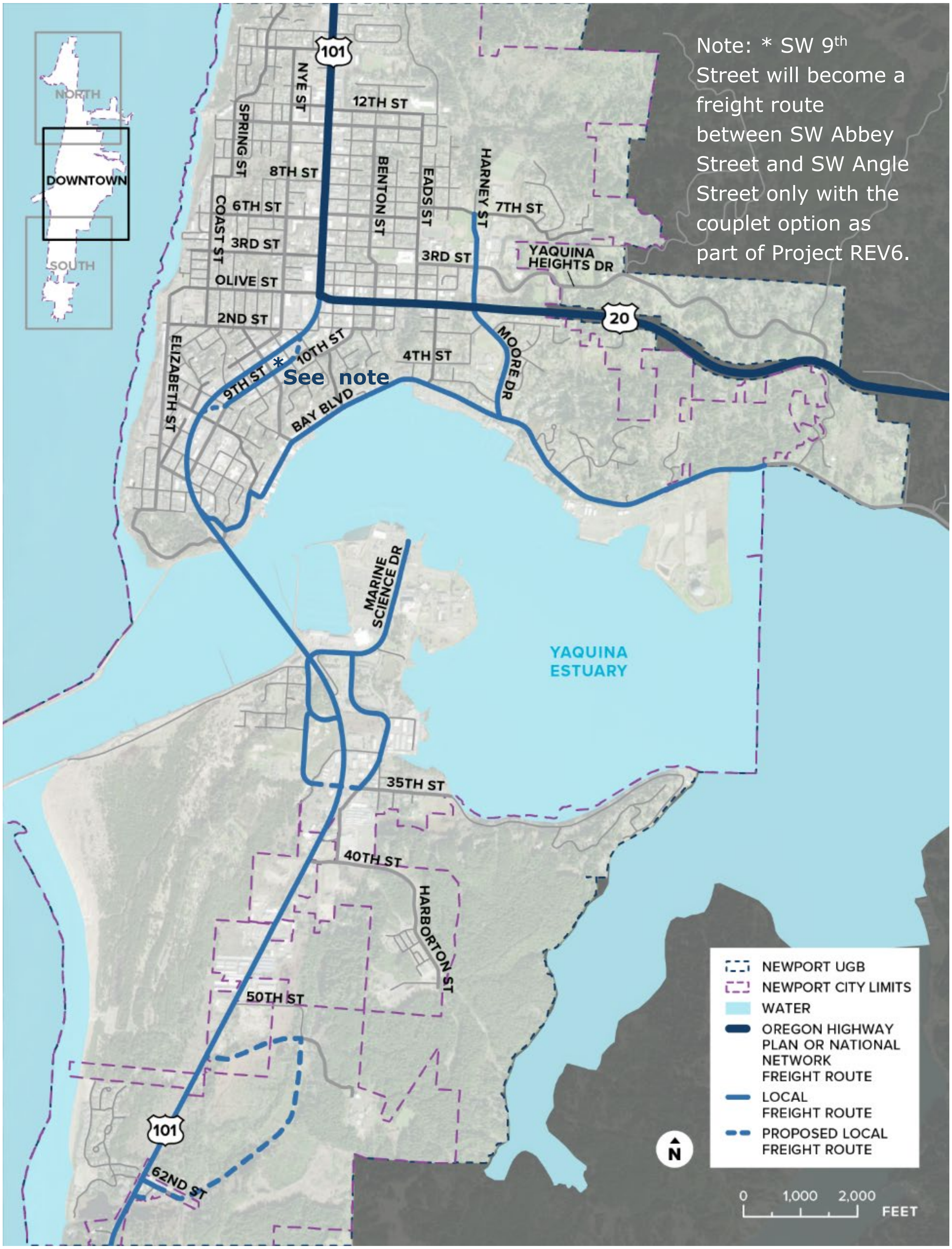
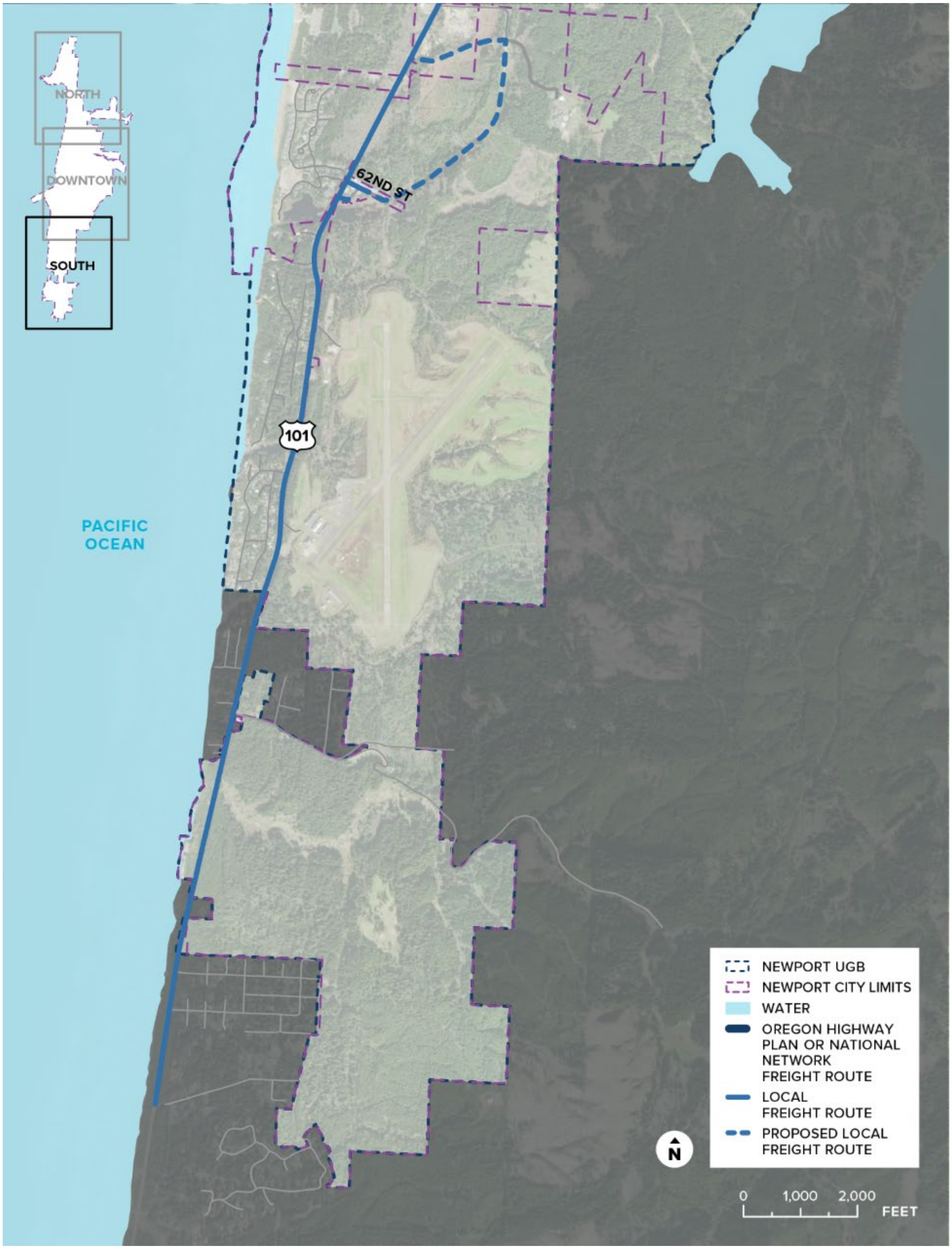


FIGURE 27: FREIGHT AND TRUCK ROUTES (SOUTH MAP AREA)



MULTIMODAL NETWORK DESIGN

The design of the streets in Newport is based on the functional classifications. The designs are intended to be implemented in newly developing or redeveloping areas of the City. The City may also choose to reconstruct existing streets to meet the typical designs should right-of-way or other factors not prevent it from occurring.

Roadway cross-section design elements include travel lanes, curbs, furnishings/landscape strips, sidewalks on both sides of the road, and bicycle facilities. The following sections detail the minimum widths for each of Newport's functional classifications.

The construction or reconstruction of some streets may be constrained by various factors that prevent it from being constructed according to the minimum standards that apply. A deviation to the City street standards may be requested from the City Engineer or City Engineer's designee to consider a constrained cross-section or other adjustments. In some cases, unconstrained local streets in residential areas may also apply the yield or shared street design parameters if they serve a low volume of traffic (i.e., fewer than 500 vehicles per day).

Typical conditions that may warrant consideration of a deviation include:

- Infill sites
- Innovative designs
- 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

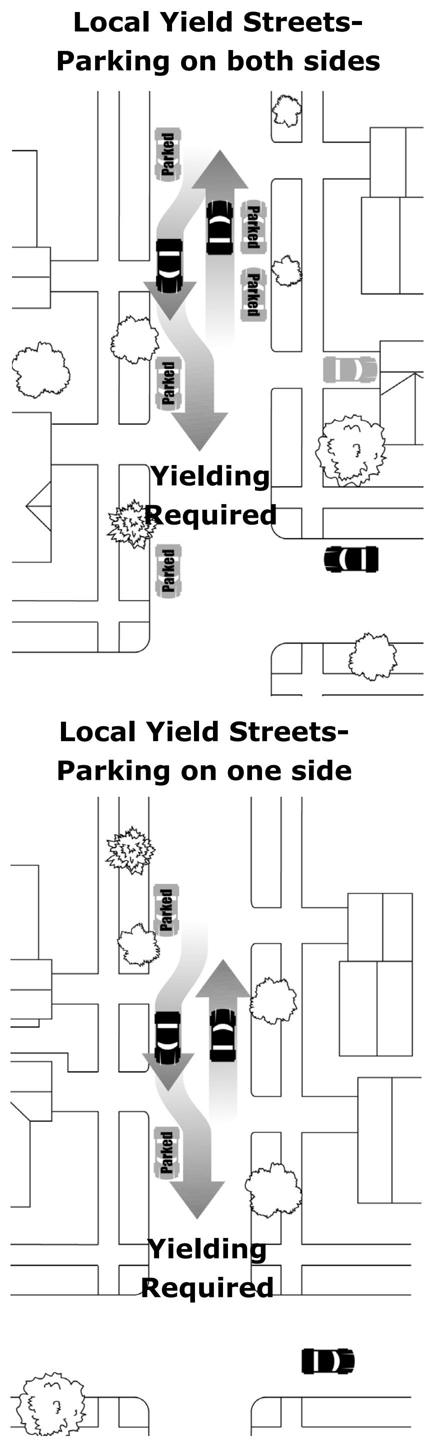
Although the facility requirements along arterial streets are provided, both US 101 and US 20 are under the State's jurisdiction and are subject to the design criteria in the Highway Design Manual (HDM), other ODOT manuals. The facility requirements along arterial streets are consistent with ODOT's urban design guidance and the applicable urban contexts for US 101 and US 20 through Newport (more details provided in the Appendix). Any deviation to standards along these facilities must be approved by the State.

TRAVEL LANES AND PARKING

The vehicle classifications and local truck routes determine the design parameters for travel lanes of each street. This is the throughway for drivers, including cars, buses, and trucks. Table 2 provides the travel lane and on-street parking requirements. The vehicle functional classification of the street is the starting point to determine the number of through lanes, lane widths, and median and left-turn lane requirements. However, Newport's local truck routes take precedence when determining the appropriate lane width regardless of the functional classification. Streets identified as part of Newport's local truck network may include travel lanes up to 12 feet wide, although 11 feet travel lanes are also acceptable. Wider lanes (over 12 feet) should only be used for short distances along curves and at intersections to allow trucks to maneuver. Streets that require a median/ center turn lane should include a minimum 8-foot-wide pedestrian refuge at marked crossings. Otherwise, the median can be reduced to a minimum of 4 feet at midblock locations, before widening at intersections for left-turn lanes (where required or needed).

Select low-volume local streets (i.e., fewer than 500 vehicles per day) in new residential areas are also candidates for narrower roadway widths. These narrower streets, referred to as yield streets, should be designed so that moving cars must occasionally yield between parked cars before moving forward, as shown in Figure 28, allowing for the development of narrow streets, encouraging vehicles to move slower, and allowing for periodic areas where a 20-foot-wide clear area is available for parking of fire apparatus. Yield streets require placement of no-parking locations (i.e., driveways, fire hydrants, mailboxes) at appropriate intervals to provide the needed gaps for queuing opportunities. For blocks longer than 300 feet, 30-foot-long pullouts/no parking zones should be provided every 150 feet to allow for 20-foot-wide clear areas or 26-foot-wide near fire hydrants. Because fire apparatus preconnected hoses are 150 feet in length, blocks shorter than 300 feet do not require pullouts. With a connected street system and 300-foot block lengths, the fire apparatus can be parked at the end of the block where a fire is located, and the hose can reach the fire. Also, parking near intersections on narrow streets should not be permitted because it can interfere with the turning movements of large vehicles.

FIGURE 28: YIELD STREETS



Source: Neighborhood Street Design Guidelines, State of Oregon

Some existing streets may also be designed as shared streets (i.e., in areas with infill development), which also require vehicle traffic to yield to pedestrians and bicyclists within the roadway. Shared streets accommodate pedestrians, bicyclists, and motor vehicles, giving pedestrians priority over cars and bicyclists. The shared street does not have clear division between pedestrian and auto space (i.e., no continuous curb), so motorists must slow down and drive with caution.

Shared street example with intermittent on-street parking.

Features of shared streets should include: 1) gateways that announce the entrance(s) to the shared street; 2) curves to slow vehicle traffic by limiting sightlines for drivers; 3) amenities such as trees and play equipment that force vehicles to slow down; 4) no curbs; and 5) intermittent parking. Cars can pass each other along a shared street, but typically only in selected locations. The speed limit is typically about 10-15 miles per hour, and shared street signs with these posted speeds are allowed.

Shared street example with street level pedestrian walkway.

The City consulted with the Newport Fire Department when developing the design requirements for yield/shared streets shown in Table 2, as required by ORS 368.039(3).

TABLE 2: TRAVEL LANE AND ON-STREET PARKING REQUIREMENTS

ROADWAY CLASSIFICATION	ARTERIAL STREET (ODOT)[1]	MAJOR COLLECTOR STREET (CITY)	NEIGHBORHOOD COLLECTOR STREET (CITY)	LOCAL STREET (CITY)	YIELD/SHARED STREET (CITY)[2]
TYPICAL THROUGH LANES (BOTH DIRECTIONS)	2 to 4	2	2	2	1
MINIMUM LANE WIDTH	11-12 ft.[3]	10 ft.[4]	10 ft.[4]	10 ft.	12-16 ft. single lane
MEDIAN/ CENTER TURN LANE [5]	Required 11-14 ft. median/ center turn lane[6]	Required 11 ft. center turn lane near arterial intersections[7]	11 ft. center turn lane when needed near arterial intersections	None	None
MINIMUM ON-STREET PARKING WIDTH	Context dependent, 7-8 ft.	Preferred 8 ft. [8]	Preferred 8 ft.[8]	Preferred 7-8 ft.[8]	Required 7-8 ft. on at least one side[8]

Notes:

1. Although guidance is provided for arterial streets, these are under State jurisdiction. Values presented in this table are consistent with ODOT's urban design guidance. For detailed design recommendations on US 101 and US 20, the identified urban contexts for Newport are provided in the appendix and ODOT's urban design guidance is publicly available.
2. For use along low volume local streets in residential areas only. Yield streets are an option for new streets, while shared streets are an option for existing streets. Requires intermittent on-street parking on at least one side to allow for vehicle queuing and passing opportunities. For blocks of no more than 300 ft. in length, and with fire access roads at both ends, a 16 ft. width may apply to local streets that carry fewer than 500 vehicles per day, or a 12 ft. width may apply to local streets that carry fewer than 150 vehicles per day. For blocks longer than 300 feet, this also requires 30 ft. long pullouts/no parking zones every 150 ft. to allow for 20 ft. wide clear areas or 26 ft. wide clear areas near fire hydrants.
3. 11 ft. travel lanes are preferred for most urban contexts within Newport. 11 ft. travel lanes are standard for central business district areas in ODOT's urban design guidance. Adjustments may be required for freight reduction review routes. Final lane width recommendations are subject to review and approval by ODOT.
4. Travel lanes widths of 11-12 ft. are required along designated local truck routes.
5. A minimum 8-ft.-wide pedestrian refuge should be provided at marked crossings. Otherwise, a median can be reduced to a minimum of 4 ft. at midblock locations that are more than 150 ft. from an arterial (i.e., US 101 and US 20), before widening at intersections for left-turn lanes (where required or needed).
6. ODOT's urban design guidance recommends a 14 ft. lane for speeds above 40 mph. Final lane width recommendations are subject to review and approval by ODOT.
7. Center turn lane required at and within 150 ft. of intersections with arterials (i.e., US 101 and US 20). Otherwise, it is optional and should be used to facilitate turning movements and/or street crossings; minimum 8-ft-wide median required where refuge is needed for pedestrian/bicycle street crossings.
8. On-street parking is preferred along all City streets where block spacing, and system connectivity standards are met. An 8 ft. width is required in most areas, with a 7 ft. width only allowed along local streets in residential areas. Local yield/shared streets require intermittent on-street parking on at least one side to allow for vehicle queuing and passing opportunities, with an 8 ft. width required when on only one side, and 7 ft. width allowed when on both sides. Shoulders totaling 8 ft. in collective width may also be provided in lieu of parking.

SIDEWALKS

Sidewalks provide for pedestrian movement and access, enhance pedestrian connectivity, and promote walking. The pedestrian facilities in Newport encourage walking by making it more attractive. The street functional classification determines the appropriate pedestrian facilities along streets, including the width of the throughway for pedestrians and the buffer from the vehicle travel way. Sidewalks are typically required on both sides of newly constructed streets, but in some cases may be provided on only one side where it can be demonstrated that it aligns with the existing developed street section or that construction on both sides is not cost effective due to significant topographical constraints, as determined by the City Engineer or City Engineer's designee. A non-remonstrance agreement (i.e., agreement to participate in a future local improvement district) is also an option for infill development on streets that lack sidewalks. Additional optional amenities for pedestrians, such as curb extensions or bulb-outs, may also be needed where appropriate.

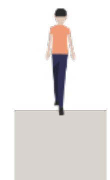
FIGURE 29: SIDEWALK ZONES

The sidewalk encompasses four zones (as shown in Figure 29), including the edge, pedestrian throughway, furnishings/ landscape, and the buffer (i.e., on-street parking or bike facilities). These zones are summarized below, with the minimum configuration for each provided in Table 3. Sidewalk facilities constructed on State facilities are subject to review and approval by ODOT based on ODOT's urban design guidance.

- The **edge** describes the section where a pedestrian interacts with the adjacent buildings or private property and includes entryways and outdoor seating. This zone is optional along City streets and may include a concrete or natural surface depending on the adjacent land use.
- The **pedestrian throughway** is the accessible zone in which pedestrians travel.
- The **furnishings/ landscape** zone is the sidewalk section located between the pedestrian throughway and the curb, and includes street furnishings or landscaping (e.g., benches, lighting, bicycle parking, tree wells, and/or plantings). If adjacent to on-street parking, it should also include a clearance distance between any curbside parking and the street furnishing area or landscape strip (i.e., so vehicles parking, or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches, into the furnishings/landscape strip.

- The **buffer** is the space between the pedestrian throughway and the vehicle travel way, and may consist of bike facilities, on-street parking, curb extensions, or other elements. This is also the location where users will access transit. It encompasses the width of on-street parking, bike facilities, and furnishings/landscape zone.

TABLE 3: MINIMUM SIDEWALK CONFIGURATION

FUNCTIONAL CLASSIFICATION	ARTERIAL (ODOT)	MAJOR COLLECTOR (CITY)		NEIGHBORHOOD COLLECTOR (CITY)	LOCAL/ YIELD STREET (CITY)[3]
		COMMERCIAL	NON-COMMERCIAL		
MINIMUM CONFIGURATION [1]					
EDGE	1-4 ft.	0 ft.	0 ft.	0 ft.	0 ft.
PEDESTRIAN THROUGHWAY	5-10 ft.	8 ft. [4]	6 ft.	6 ft.	5 ft.
FURNISHINGS/ LANDSCAPE (INCLUDES CURB)	5.5-6.5 ft.	3 ft.	3 ft.	0.5 ft.	0.5 ft.
MINIMUM WALKWAY WIDTH	Variable[5]	11 ft.	9 ft.	6.5 ft.	5.5 ft.
MINIMUM BUFFER (PEDESTRIAN THROUGHWAY TO VEHICLE TRAVEL WAY)[2]	Variable[5]	3 ft.	3 ft.	0.5 ft.	0.5 ft.

Notes:

1. Minimum widths may be expanded in areas with enhanced pedestrian activity, or when identified as a project in this TSP or subsequently adopted refinement plan. For instance, the edge zone may need to be expanded to accommodate outdoor seating for the adjacent land use.
2. Includes width of on-street parking, bike facilities, and furnishings/landscape zone.
3. Local streets that are also constructed as shared streets do not require curbs and may include a 5 ft. shoulder walkway at street level, with the travel lanes and shoulders satisfying pedestrian needs. In constrained cases, the shoulder walkway may be provided on only one side, or eliminated.
4. In highly constrained locations, the landscape buffer may be eliminated to meet the required 8 ft. pedestrian throughway with approval from the City Engineer, City Engineer's designee or Planning Director.
5. Desired walkway and buffer width for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in ODOT's urban design guidance.

BICYCLE FACILITIES

Bike facilities help support the movement of people riding bikes. Streets should be safe and comfortable for bicyclists of all ages and abilities to encourage ridership. Building high quality bicycle infrastructure can improve transportation safety, minimize public health risks, reduce congestion, and provide more equitable access to transportation. The minimum bicycle facilities can be seen in Table 4. Vehicle function classification is used to determine the appropriate facilities along streets. The minimum treatments include protected or separated facilities from the vehicle travel way along arterial streets, bicycle lanes along major collector streets, and shared streets with shared lane markings along neighborhood collector streets. All local streets in Newport are shared streets for bikes, but they do not include shared lane markings unless specifically called out in the TSP.

In general, facilities that are protected or separated from the vehicle travel way include a 10-foot two-way or 6-foot one-way cycle track, 10-foot shared use path, or 8-foot buffered bike lanes. Standard bike lanes should be a minimum of 6-feet wide, while some shared streets should include shared lane markings, with vehicle speed and volume management.

TABLE 4: MINIMUM BICYCLE FACILITIES

VEHICLE CLASSIFICATION	ARTERIAL (ODOT) [2]	MAJOR COLLECTOR (CITY)	NEIGHBORHOOD COLLECTOR (CITY)	LOCAL/YIELD/ SHARED STREET (CITY)
MINIMUM BIKE FACILITY[1]	Protected or separated facilities from the vehicle travel way (e.g., shared use path, cycle track, buffered bicycle lanes)	Standard Bicycle lanes[3]	Shared bike streets with shared lane markings[4]	Shared bike streets without shared lane markings

Notes:

1. Any modification of the minimum bike facility requires justification of any constraints (e.g., topography, environmental, existing buildings) and approval of an acceptable deviation from ODOT, or the City prior to construction, depending on the agency with jurisdiction of the roadway.
2. Bicycle facility and buffer width for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in ODOT's urban design guidance.
3. Standard bicycle lanes require a minimum width of 6 ft.
4. Minimum treatments include shared lane markings, and wider travel lanes to encourage safe passing for motorists. May also include treatments to manage vehicle speeds and volumes.

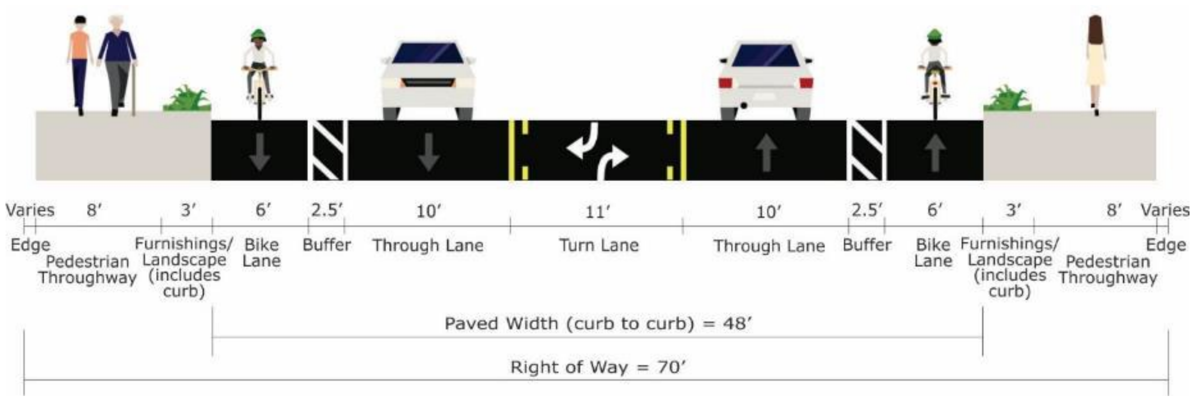
MINIMUM STREET CROSS-SECTIONS

The minimum cross-sections for City major collectors, neighborhood collectors, local streets, and yield/shared streets are provided in Figure 30, Figure 31, Figure 32, Figure 33, Figure 34 and Figure 35, respectively. These are based on the minimum design requirements outlined earlier in Table 2, Table 3, and Table 4. In cases other than those involving needed housing as defined in ORS 197.303(1), the minimum widths may be expanded with justification, at the discretion of the City Engineer or City Engineer's designee. For instance, the edge zone may need to be expanded to accommodate outdoor seating for the adjacent land use. All cross-sections provided below assume that the street is not located on a designated Newport local truck route. Local truck routes require travel lanes widths of 11 to 12 feet.

No minimum cross-sections are provided for arterials (i.e., US 101 and US 20) in Newport since these streets are subject to review and approval by ODOT. Design guidance from ODOT is publicly available and is summarized earlier in Table 2, Table 3, and Table 4. ODOT's design guidance is context dependent which provides flexibility in specific element widths when determining the cross-sections.

FIGURE 30: CITY MAJOR COLLECTOR (COMMERCIAL AREA) CROSS-SECTION

Within 150 feet of Intersection with Arterials (i.e., US 101 and US 20)



More than 150 feet from Intersection with Arterials (i.e., US 101 and US 20)

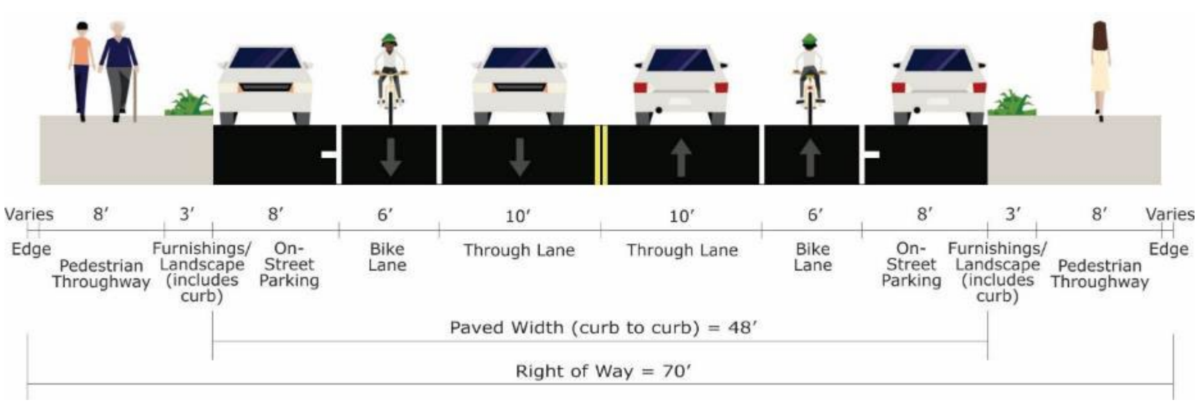
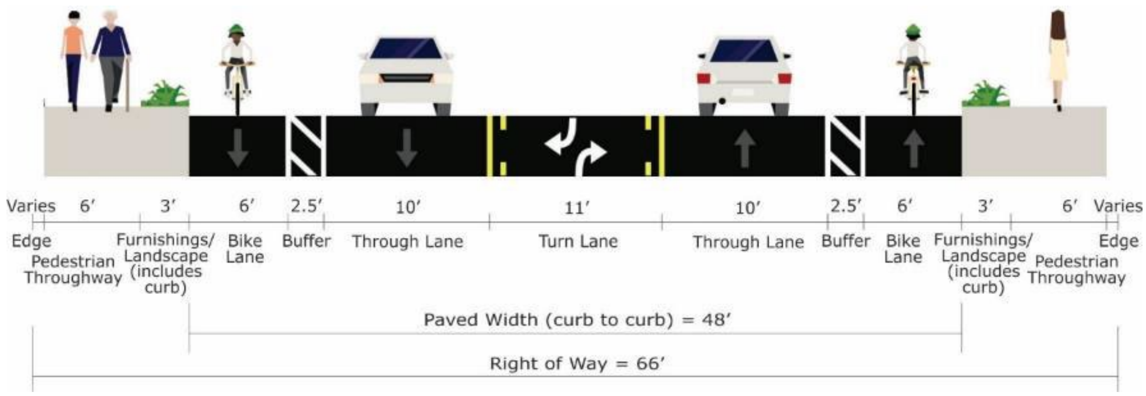


FIGURE 31: CITY MAJOR COLLECTOR (NON-COMMERCIAL AREA) CROSS-SECTION

Within 150 feet of Intersection with Arterials (i.e., US 101 and US 20)



More than 150 feet from Intersection with Arterials (i.e., US 101 and US 20)

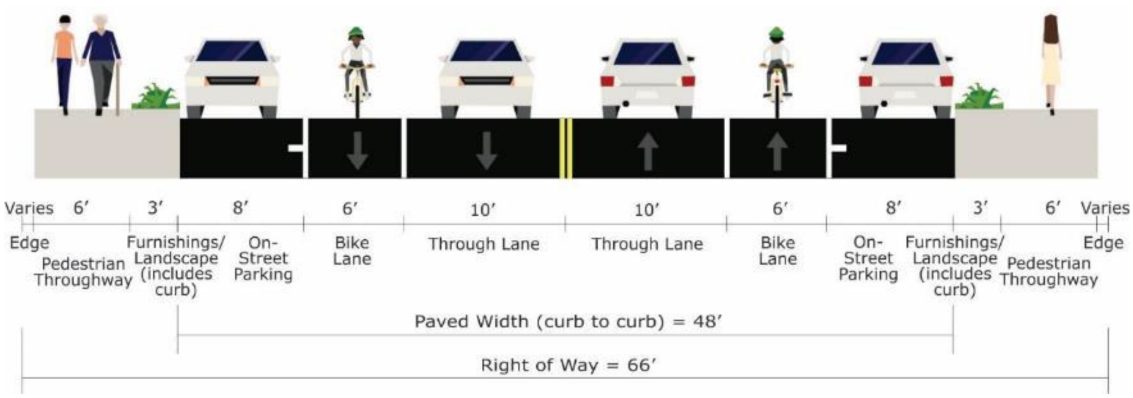


FIGURE 32: CITY NEIGHBORHOOD COLLECTOR CROSS-SECTION

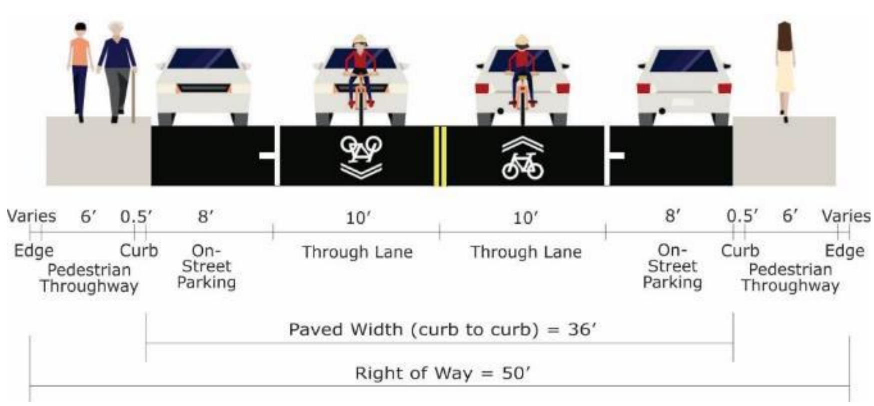


FIGURE 33: CITY LOCAL STREET CROSS-SECTION

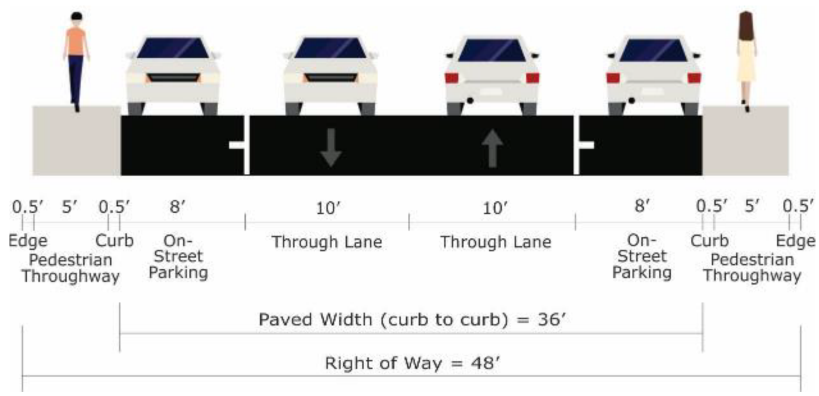
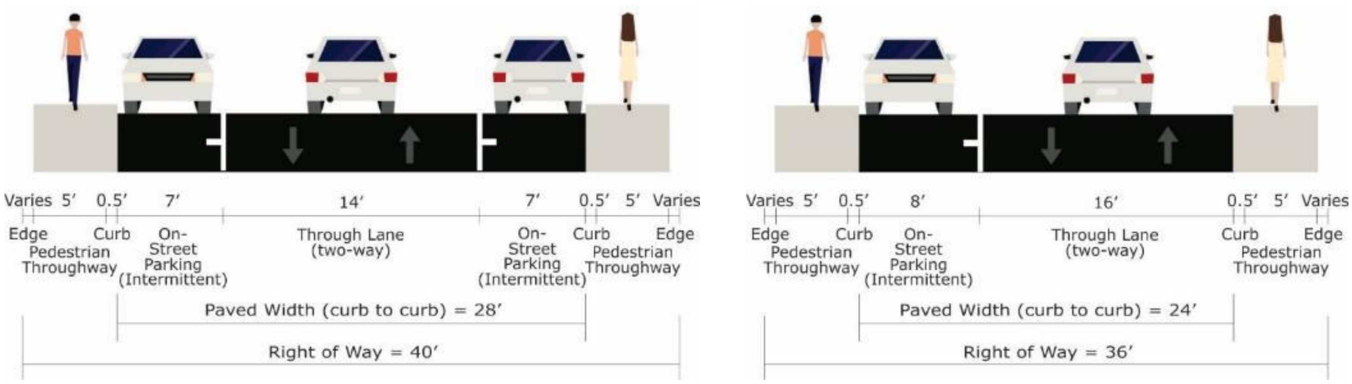
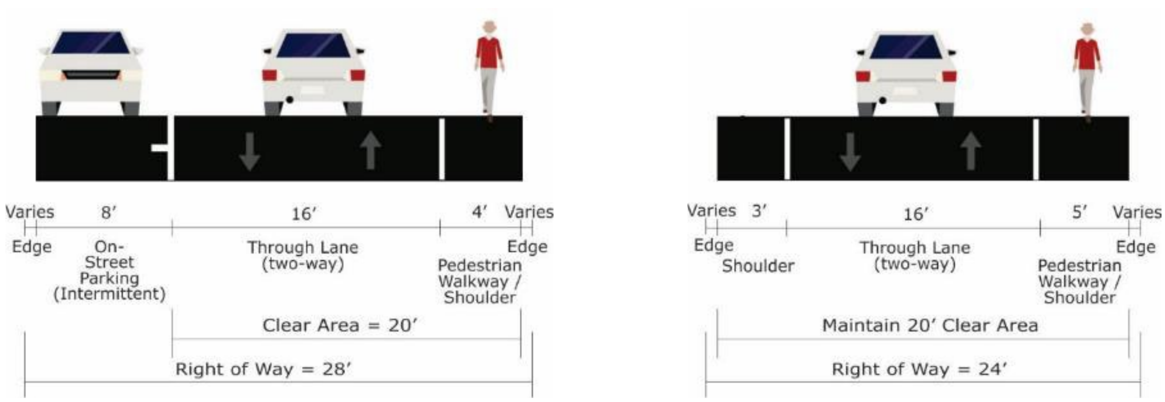


FIGURE 34: CITY LOCAL YIELD STREET CROSS-SECTION



Note: For use along low volume local streets in residential areas only that carry fewer than 500 vehicles per day, with blocks of no more than 300 ft. in length. For blocks longer than 300 feet, this also requires 30 ft. long pullouts/no parking zones every 150 ft.

FIGURE 35: CITY LOCAL SHARED STREET CROSS-SECTION



Note: For use along low volume local streets in residential areas only that carry fewer than 500 vehicles per day, with blocks of no more than 300 ft. in length. Through lane width of yield and shared streets may be reduced to 12 ft. in areas that carry fewer than 150 vehicles per day. For blocks longer than 300 feet, this also requires 30 ft. long pullouts/no parking zones every 150 ft.

SEPARATED PEDESTRIAN AND BICYCLE FACILITIES

Some pedestrian and bicycle facilities may be separated from the right-of-way of a street. These facilities include pedestrian trails, pedestrian and bicycle accessways, and shared use paths. These facilities serve a variety of recreation and transportation needs for pedestrians and bicyclists.

PEDESTRIAN TRAIL

Pedestrian trails are typically located in parks or natural areas and provide opportunities for both pedestrian circulation and recreation. They are recommended to include a minimum width of 5 feet (see Table 5) and may include a hard or soft surface.

ACCESSWAY

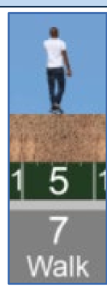
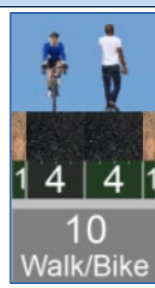
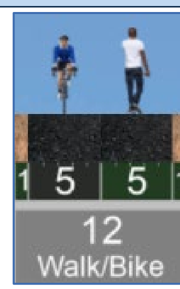
Accessways provide short path segments between disconnected streets or localized recreational walking and biking opportunities. Accessways must be on public easements or rights-of-way and have minimum paved surface of 8 feet, with a 1-foot shoulder on each side, and 10 feet of right-of-way. Accessways should be provided in any locations where the length between existing pedestrian and bicycle connections exceeds the maximum allowable length identified in Table 5.

SHARED USE PATH

Shared use paths provide off-roadway facilities for walking and biking travel. Depending on their location, they can serve both recreational and citywide circulation needs. Shared use path designs vary in surface types and widths, although hard surfaces are generally better for bicycle travel. Widths need to provide ample space for both walking and biking and should be able to accommodate maintenance vehicles.

A shared use path should be at least 10 feet wide, with a 1-foot shoulder on each side, and 12 feet of right-of-way (see Table 5). A shared use path width of 12 feet is required along ODOT facilities and may be applied in other areas with significant walking or biking demand (e.g., Nye Beach Area, Oregon Coast Bike Route), or when identified as a project in this TSP or subsequently adopted refinement plan.

TABLE 5: MINIMUM SEPARATED PEDESTRIAN AND BICYCLE FACILITY DESIGNS

FACILITY OPTIONS	PEDESTRIAN TRAIL DESIGN	ACCESSWAY OR LOW USE SHARED USE PATH DESIGN[1]	TYPICAL SHARED USE PATH DESIGN[2]
MINIMUM CONFIGURATION			

Notes:

1. For short segments, a low use shared use path can be as narrow as 8 feet wide, with a 1-foot shoulder on each side and a total right-of-way of 10 feet.

2. A shared use path width of 12 feet is required parallel to ODOT facilities and may be applied in other areas with significant walking or biking demand (e.g., Nye Beach Area, Oregon Coast Bike Route). A shared-use path narrower than 12-feet in width is only allowed if approved by ODOT.

VEHICLE MOBILITY STANDARDS

Mobility standards for streets and intersections in Newport provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur. Two common methods currently used in Oregon to gauge traffic operations for motor vehicles are volume to capacity (v/c) ratios and level of service (LOS), described below.

- Volume-to-capacity (v/c) ratio: A v/c ratio is a decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00 (generally above 0.70), congestion noticeably increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.
- Level of service (LOS): LOS is a "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay is excessive, and demand exceeds capacity, typically resulting in long queues and delays.

City street performance standards for motor vehicles are shown in Table 6.

TABLE 6: VEHICLE MOBILITY STANDARDS FOR CITY STREETS

INTERSECTION TYPE	MOBILITY STANDARD	REPORTING MEASURE
SIGNALIZED	LOS D and v/c ≤0.90	Intersection
ALL-WAY STOP OR ROUNDABOUTS	LOS D and v/c ≤0.90	Worst Approach
TWO-WAY STOP [1]	LOS E and v/c ≤0.95	Worst Major Approach/ Worst Minor Approach

Notes:

1. Applies to approaches that serve more than 20 vehicles; there is no standard for approaches serving lower volumes.

State facilities must comply with the existing mobility targets included in the Oregon Highway Plan and shown in Table 7. Alternative mobility targets have previously been adopted on US 101 in South Beach, and because constraints make meeting mobility targets along US 101 (north of Yaquina Bay) and US 20 impractical, the TSP also recommends that the Oregon Transportation Commission adopt alternative mobility targets for these highway segments. More information can be found in Technical Memorandum #11 in the Appendix.

TABLE 7: EXISTING MOBILITY TARGETS FOR US 20 AND US 101

ROADWAY	EXTENTS	ADOPTED V/C MOBILITY TARGET	
		SIGNALIZED	UNSIGNALIZED[1]
US 101	North Urban Growth Boundary to NE 20th Street	≤ 0.80	≤ 0.80/0.90
	NE 20th Street to SE 40th Street[2]	≤ 0.90 except US 101/SE 35th St: ≤0.99	≤ 0.90/0.95
	SE 40th Street to south Urban Growth Boundary[2]	≤ 0.80 except US 101/SE 40th St: ≤0.99 US 101/South Beach State Park/SE 50th St: ≤0.85	≤ 0.80/0.90
US 20	Urban Growth Boundary to Moore Drive	≤ 0.80	≤ 0.80/0.90
	Moore Drive to US 101	≤ 0.85	≤ 0.85/0.95

Notes:

1. For unsignalized intersections, the mobility target is listed for major approach/minor approach.
2. Alternative mobility targets have been adopted in South Beach.

MULTIMODAL CONNECTIVITY

Transportation facility and access spacing standards include a broad set of techniques that balance the need to provide for efficient, safe, and timely multimodal travel with the ability to allow access to individual destinations. These standards help create a system of direct, continuous, and connected transportation facilities to minimize out-of-direction travel and decrease travel times for all users, while enhancing safety for people walking, biking and driving by reducing conflict points.

Table 8 identifies maximum and minimum public roadway intersection, minimum private access, and maximum pedestrian and bicycle accessway spacing standards for streets in Newport. New streets or redeveloping properties must comply with these standards. A deviation to the standards may be requested to the City Engineer or City Engineer's designee. The request must include appropriate documentation to illustrate why the standards cannot be met, and that, as proposed, the access can function safely and efficiently. As the opportunity arises through redevelopment, existing streets or driveways not complying with these standards could improve with strategies such as shared access points, access restrictions (through the use of a median or channelization islands), or closure of unnecessary access points, as feasible.

All arterial streets in Newport are under State jurisdiction. See the Oregon Highway Plan and ODOT Highway Design Manual for spacing standards along US 101 and US 20.

TABLE 8: TRANSPORTATION FACILITY AND ACCESS SPACING STANDARDS

SPACING STANDARD[1]	ARTERIALS (ODOT)[3]	MAJOR COLLECTORS (CITY)	NEIGHBORHOOD COLLECTORS (CITY)	LOCAL STREETS (CITY)
MAXIMUM BLOCK LENGTH (PUBLIC STREET TO PUBLIC STREET)	NA	1,000 ft.	1,000 ft.	1,000 ft.
MINIMUM BLOCK LENGTH (PUBLIC STREET TO PUBLIC STREET)	NA	200 ft.	150 ft.	125 ft.
MAXIMUM LENGTH BETWEEN PEDESTRIAN/BICYCLE CONNECTIONS (PUBLIC STREET TO PUBLIC STREET, PUBLIC STREET TO CONNECTION OR CONNECTION TO CONNECTION)[2]	NA	300 ft.	300 ft.	300 ft.
MINIMUM DRIVEWAY SPACING (DRIVEWAY TO DRIVEWAY)	350-1,320 ft. [3]	100 ft.	75 ft.	N/A
MINIMUM INTERSECTION SET BACK (FULL ACCESS DRIVEWAYS ONLY)	350-1,320 ft. [3]	150 ft.	75 ft.	35 ft.
MINIMUM INTERSECTION SET BACK (RIGHT-IN/RIGHT-OUT DRIVEWAYS ONLY)	350-1,320 ft. [3]	75 ft.	50 ft.	35 ft.

Notes:

1. All distances measured from the edge of adjacent approaches. All properties are allowed one driveway, which must take access from the lowest classified roadway when adjacent to more than one roadway.
2. Mid-block pedestrian and bicycle connections must be provided when the block length exceeds 300 feet to ensure convenient access for all users. Mid-block pedestrian and bicycle connections must be provided on a public easement or right-of-way every 300 feet, unless the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use or other factors that may prevent safe crossing. When the block length is less than 300 feet, mid-block pedestrian and bicycle connections are not required.
3. All arterial streets in Newport are under ODOT jurisdiction. ODOT facilities are subject to access spacing standards in the Oregon Highway Plan (see Table 14 of Appendix C) which vary based on posted speed, traffic volumes and setting. A summary of the current standards is provided below by segment:

   US 101:
   - North UGB to NW 66th Drive (55 mph): 1,320 feet
   - NE 60th Street to NE 20th Street (45 mph): 800 feet
   - NE 20th Street to NE 2nd Street (35 mph): 500 feet
   - NE 2nd Street to SW Neff Way (25 mph): 350 feet
   - SW Neff Way to SE 40th Street (35 mph): 500 feet
   - SE 40th Street to SE 50th Street (45 mph): 800 feet
   - SE 50th Street to south UGB (55 mph): 1,320 feet

   US 20:
   - US 101 to NE Harney Street (30 mph): 500 feet
   - NE Harney Street to east UGB (55 mph): 1,320 feet

LIFELINE ROUTES

Newport's location on the Oregon Coast makes it vulnerable to both earthquakes and tsunamis. Statewide planning efforts have previously identified seismic lifeline routes and tsunami evacuation routes within Newport. The Oregon Seismic Lifeline Routes are a set of streets designated to facilitate emergency response and rapid economic recovery following a disaster. These routes are categorized as Tier 1, 2 and 3, with higher tier routes prioritized for seismic retrofits on existing state-owned facilities[5]. Within Newport, US 101 (north of US 20) is a designated Tier 1 lifeline route. Both US 101 (south of US 20) and US 20 are designated Tier 3 lifeline routes. These routes are identified in Technical Memorandum #10 in the Appendix.

In the event of a tsunami, the City's beach front, creek drainages, and the south beach area will need to evacuate. The tsunami hazard areas and identified evacuation assembly areas are also identified in Technical Memorandum #10 in the Appendix. Specific evacuation routes for each low-lying area are also available online. While much of Newport is outside of the tsunami inundation area, it is still susceptible to other hazards resulting from a seismic event (i.e., bridge failure).

Ensuring the lifeline and evacuation routes serve their intended purpose both during and following a disaster will be critical to ensure public safety and facilitate recovery. This TSP includes projects that promote seismic resilience on lifeline routes, adds pedestrian or bicycle facilities on evacuation routes, and other wayfinding projects.

STREET STORMWATER DRAINAGE MANAGEMENT

The City of Newport Municipal Code states that drainage facilities should be designed to consider the capacity and grade necessary to maintain unrestricted flow from areas draining from a new land division and to allow extension of the system to serve such areas. In addition to providing conveyance capacity, improvements to City streets should incorporate stormwater Best Management Practices (BMPs) to mitigate the negative effects to water quality and attenuate runoff volumes and peak flows where practical. The type and extent of these BMPs will depend on the extent of the improvements, potential pollutant loading and potential for significant downstream impacts due to increased peak flows and volumes. The physical constraints of topography or environmentally sensitive, historic or developed areas that make constructing or reconstructing a roadway a challenge also apply to finding suitable space for stormwater management BMPs. See TSP Appendix M for some of the potential BMP types and where they may be suitable.

Prior to construction of any transportation improvements, a project specific stormwater investigation should be completed to determine the site specific constraints and appropriate BMPs.

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[5] The routes identified as Tier 1 are the most significant and necessary to ensure a functioning statewide transportation network. A functioning Tier 1 lifeline system provides traffic flow through the state and to each region. The Tier 2 lifeline routes provide additional connectivity and redundancy to the Tier 1 lifeline system. The Tier 2 system allows for direct access to more locations and increased traffic volume capacity, and it provides alternate routes in high-population regions in the event of outages on the Tier 1 system. The Tier 3 lifeline routes provide additional connectivity and redundancy to the lifeline systems provided by Tiers 1 and 2.

The ODOT Hydraulics Manual along with DEQ stormwater guidance should be consulted for specific design parameters.

A review of the downstream stormwater conveyance system should be completed as part of any modifications to ensure that the runoff is not contributing to issues with capacity or integrity of the stormwater outfall. The extent of the downstream analysis will depend on the extent of the improvements and specific site conditions.

AGATE BEACH STORMWATER CONSIDERATIONS

As noted in the Geotechnical Consultation for Agate Beach memorandum prepared by Foundation Engineering, Inc. as part of the TSP update, the Agate Beach neighborhood is experiencing a high amount of coastal erosion along with potential for settlement of undocumented fill in the low-lying areas. A site-specific analysis by a certified engineering geologist is required for development within areas of high risk of erosion, settlement or landslides. These constraints make the need for stormwater BMPs that attenuate peak flows and volumes even more critical to ensuring that erosion and settlement isn't exacerbated by newly constructed transportation infrastructure. With potential for erosion and the presence of undocumented fill, facility types that rely on infiltration (drywells, soakage trenches, infiltration planters/basins) may not be appropriate due to the varying infiltration capacity and potential to increase settlement or erosion. Flow-through facilities such as swales, vegetated filter strips or mechanical treatment are likely more appropriate, with structured/mechanical treatment being the most likely approach to achieve stormwater management goals while minimizing the potential for increased settlement or erosion.

Chapter 5: Project Development and Evaluation

This chapter describes the process followed to develop the transportation system improvement projects.

PROCESS FOR DEVELOPING PROJECTS

The project team developed the recommended transportation solutions using guidance provided by the project goals and with input from three main sources:

- Stakeholders (via advisory committee meetings, in-person events, online open houses, community workshops, project website comments, and mail-in survey responses)
- Previous Plans (such as the 2012 Newport Transportation System Plan, Oregon Coast Bike Route Plan, Yaquina Bay State Recreation Site Plan)
- Independent Project Team Evaluation (Technical Memoranda #5 through #8 Existing and Future Transportation Conditions and Needs Evaluation, and Solutions Evaluation)

The full list of projects in this TSP are referred to as Aspirational Projects. Aspirational projects include all identified projects for improving the transportation network along major streets in Newport, regardless of their priority or their likelihood to be funded. This TSP focuses on streets in the City with a vehicle functional classification of neighborhood collector and higher. Additional improvements beyond the Aspirational project list will occur with private development in the UGB, including the build out of the local street network consistent with the standards in Chapter 4.

Newport's approach to developing transportation projects emphasized improved system efficiency and management over adding capacity. The approach considered four tiers of priorities that included:

1. Highest Priority – preserve the function of the system through management practices such as improved traffic signal operations, encouraging alternative modes of travel, and implementation of new policies and standards.

2. High Priority – improve existing facility efficiency through minor enhancement projects that upgrade roads to desired standards, fill important system connectivity gaps, or include safety improvements to intersections and corridors.

3. Moderate Priority – add capacity to the system by widening, constructing major improvements to existing roadways, or extending existing roadways to create parallel routes to congested corridors.

4. Lowest Priority – add capacity to the system by constructing new facilities.

The project team recommended higher priority solution types to address identified needs unless a lower priority solution was clearly more cost-effective or better supported the goals and objectives of the City. This process allowed the City to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel. The TSP planning process screens candidate projects to set aside those that may not be feasible due to environmental or existing development limitations. The remaining projects are a combination of new and previous ideas for the transportation system that seek to address the gaps and deficiencies in the City.

PROJECT FUNDING

Each project was reviewed to consider how it might be funded during the next 20 years. In general, the primary funding agency was assumed to be the current or future facility owner, as they are responsible to oversee construction and long-term maintenance. For the TSP, all projects were assigned to either Newport or the State as the primary funding agency. In some cases, funding partnerships were identified for projects that were expected to provide mutual benefits between agencies or where there were opportunities to accelerate projects to completion. It is important to note that these funding assumptions do not obligate any agency to commit to these projects. Each project was also assigned an assumed funding source, which included the City's North Side Urban Renewal District, South Beach Urban Renewal District and other City/State revenue (i.e., Federal Funding, State Highway Trust Fund, local gas tax, System Development Charges, etc.).

This TSP also presents a high priority subset of the City's Aspirational Projects that are constrained to a level of funding that is expected to be available for the next 20 years. While there may be other partnering opportunities with ODOT and Lincoln County Transit, these decisions are ultimately up to those agencies. Private development will also likely build TSP projects in coordination with land use actions and future development in the City. While projects related to property development or re-development may occur within the TSP planning horizon, no funding was assumed from current City revenue sources since these projects will not be needed until the fronting development occurs. If the City chooses to update the local transportation system development charge in the future to incorporate the updated project list from the TSP and reassess the corresponding fees, much of the private development share will likely be included in that fee[6].

Based on historical and forecasted funding levels, the City expects to have about $76 million through the year 2040 for transportation projects in this TSP (see Figure 36). This includes about

[6] The funding analysis for the TSP assumes new private development contributions towards transportation improvements based on the current system development charge project list and fees.

$38 million for projects in the North Side Urban Renewal District boundary and another $38 million from other City and State funding sources for other citywide projects. And although it was not included in the TSP revenue forecast, the South Beach Urban Renewal District will also provide an additional $3 million in funding for remaining projects in the district boundary. This is still far below the funding required to implement all the projects in this plan, which total approximately $227 million, but may be sufficient to advance many of the higher priority projects in the City. The City may consider increasing existing fee levels, or adding new funding options to close these gaps and better prepare to accommodate growth. Refer to Technical Memorandum #9 in the Appendix for more information on the expected transportation revenue and expenditures.

FIGURE 36: EXPECTED TRANSPORTATION FUNDING COMPARED TO PROJECT EXPENSES

Note: * The South Beach Urban Renewal District will also provide an additional $3 million in funding for remaining projects in the district boundary, beyond the $76 million shown.

SPECIAL STUDIES

A series of special transportation studies was conducted as part of the TSP. The detailed evaluation process considered solutions along US 101 and US 20 in the downtown area, as well as a possible Harney Street extension to establish a new circulation route through the east end of the City between US 20 and US 101, near NE 36th Street. These solutions are large-scale capital investments that could significantly alter Newport's transportation network and travel patterns by increasing roadway capacity and constructing enhanced bicycle and pedestrian facilities. Other low-cost transportation strategies were also considered to manage congestion at all highway intersections. The following sections summarize results of each special transportation study, including factors like the available right-of way or environmental constraints which could impact implementation.

US 101 CIRCULATION OPTIONS

US 101 serves residents and visitors travelling along the Oregon Coast or within Newport. The highway, today, cuts through downtown Newport and creates a significant barrier for travel within the downtown core. High vehicle volumes on US 101 lead to significant congestion and delay on US 101 which limits access to existing local businesses and the hospital and fosters an auto-oriented downtown area. Limited existing right-of-way means that most of the roadway space is allocated to vehicle travel lanes with narrow sidewalks, narrow on-street parking, and no bicycle facilities. These characteristics limit economic development and tourism opportunities relative to other areas of the City.

Three circulation options were considered for US 101 as part of the TSP. The first option maintains the existing alignment of US 101 in downtown Newport but includes several streetscape alternatives to enhance the bicycle or pedestrian environment and increase business visibility. Two couplet options were also considered, either between SW Bayley Street and SW Angle Street or between SW Abbey Street and SW Angle Street. Both couplet options place northbound traffic on SW 9th Street while southbound traffic remains on the existing alignment of US 101. Converting US 101 to a couplet increases the total available right-of-way and allows wider sidewalks with protected bike facilities to be implemented along the corridor. These options also increase the total number of properties that front US 101 which may increase economic development opportunities for downtown Newport although extending the southern extent of the couplet to SW Bayley Street may reduce hospital access.

Each circulation option was evaluated both quantitatively and qualitatively for their impact on pedestrian travel, bicycle travel, vehicle operations, hospital access, economic redevelopment opportunities, streetscape opportunities, and cost. These options were also presented to the public at a series of online open houses and advisory committee meetings to gauge acceptance of the desired approach to circulation for US 101. Through the evaluation process, two primary options emerged, including the US 101 short couplet between SW Abbey Street and SW Angle Street, seen below in Figure 37, and an enhanced two-way version of US 101, shown in Figure 38. An evaluation of these two alternatives is provided in Table 9. These evaluation criteria were derived to measure performance of the alternatives against the primary objectives of the Northside Urban Renewal Area for the Commercial Core, and to tie the economic development potential to how the funds will be potentially leveraged.

As shown in Table 9, the US 101 short couplet option scored higher under each criterion and emerged as the preferred alternative, although neither option has been eliminated from further consideration. Constructing a couplet on US 101 between SW Abbey Street and SW Angle Street better manages traffic volumes on US 101 while also improving the bicycle and pedestrian environment and supporting economic development. Converting US 101 to one-way will address the existing delay and congestion issues at US 101/SW Hurbert Street and can better utilize the existing right-of-way, allowing for both wider sidewalks and protected bicycle facilities along the highway. However, the couplet option will impact some existing properties, as seen in Figure 37. Although the two-way option on US 101 is the less expensive of the circulation options, it is also likely to be less effective at addressing the identified needs, as shown in Table 9. A summary of the full evaluation is included in the Appendix H, and conceptual sketches are included in Appendix P.

FIGURE 37: US 101 SHORT COUPLET CIRCULATION OPTION

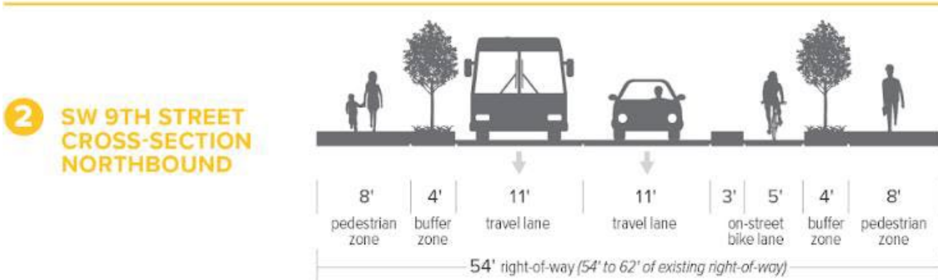
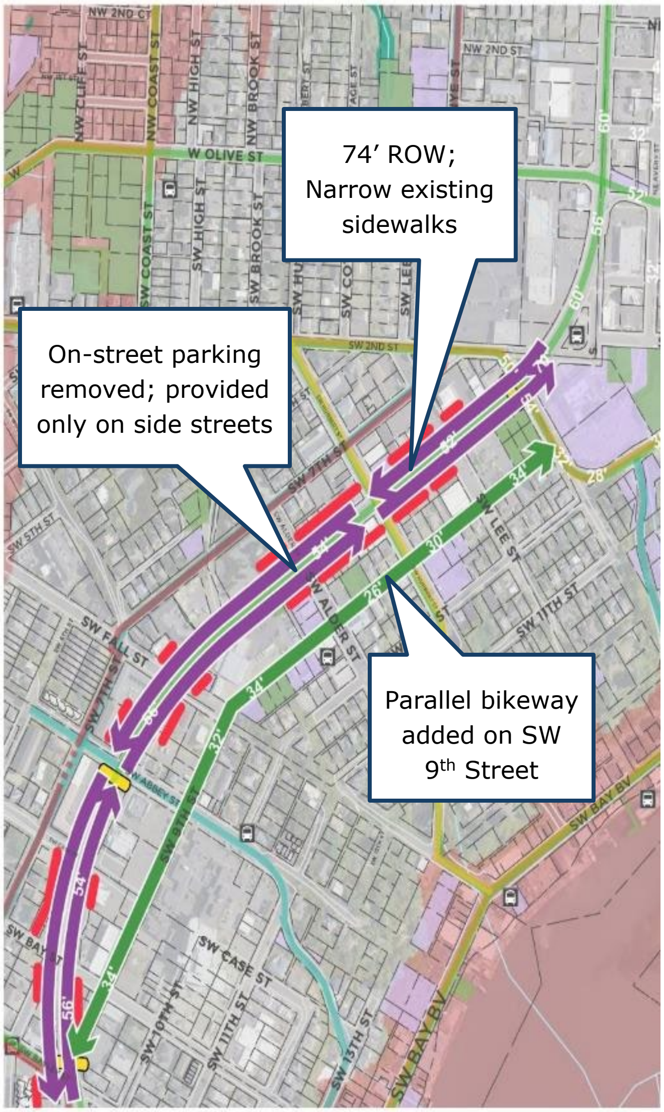
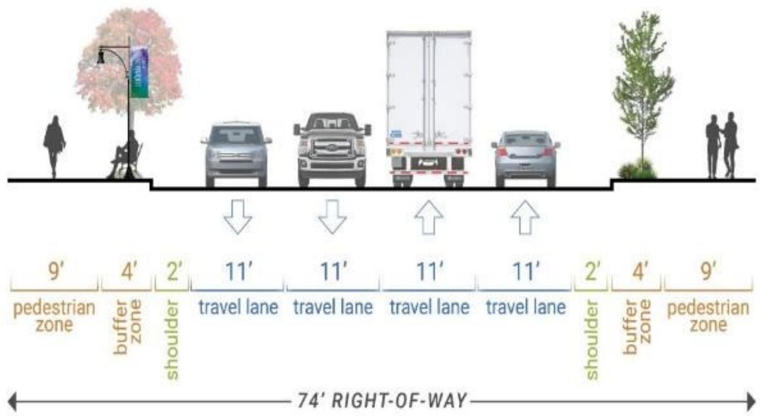


FIGURE 38: US 101 TWO-WAY CIRCULATION OPTION



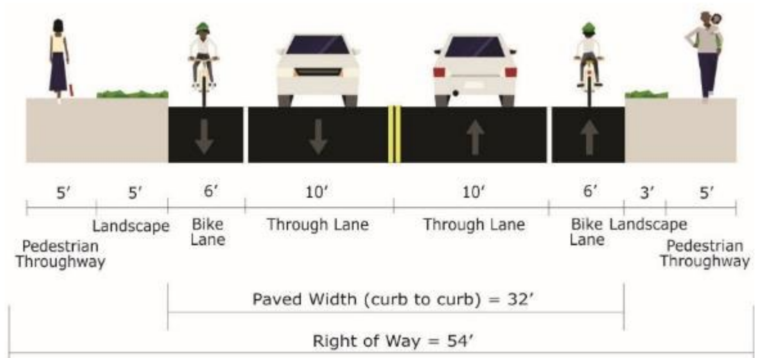
US 101



US 101 Four Lane: Wider Sidewalk Option

- Remove on-street parking, with parking on side streets and lots
- Provide wider 11’ travel lanes (from 10’ today)
- Provide wider sidewalk area with landscape

SW 9th Street



SW 9th Street Bikeway

- Remove parking, reduce lane width and add bike lanes

TABLE 9: EVALUATION OF THE US 101 ALTERNATIVES

EVALUATION CRITERIA	US 101 TWO-WAY (WITH BIKE LANES ON SW 9TH STREET)	US 101 SHORT COUPLET (SW ABBEY STREET AND SW ANGLE STREET)
PROMOTES MIXED-USES AND ACTIVITY CENTERS	+ Traffic volume on SW 9th Street remains static; difficult to promote mixed use on US 101 due to high vehicle volume and limited separation from travel lanes, no bike facilities or parking	+ + + Concentrates investment in existing most active US 101 area; adds new opportunities on SW 9th Street; wider sidewalks and addition of bike lanes creates opportunities for residential over retail mixed use
DISTRIBUTES TRANSPORTATION INVESTMENT TO THE WIDEST RANGE OF OPPORTUNITY STREETS AND SITES	+ + Primary benefit on SW 9th Street only; US 101 remains the same	+ + + Better site access, visibility, and circulation improvements in SW Fall Street to SW Angle Street corridor
IMPROVES OVERALL MOBILITY	+ + Basic traffic calming and intersection cleanup; center turn lane reduces delays, where feasible	+ + + New traffic pattern, bikeways, sidewalk upgrades, parking
IMPROVES WALKING AND BIKING NETWORK	+ + Dedicated bikeways on SW 9th Street only; no bikeways on US 101; Walking degraded on US 101 as motor vehicles are closer to sidewalk	+ + + Overall improvements provide benefits; new facilities on both street segments
INCREASES STREETSCAPE IMPROVEMENT OPPORTUNITIES	+ + No change on US 101; new opportunities on SW 9th Street	+ + + Provides much space for streetscape upgrades
IMPROVES THE STREET GRID AND URBAN PATTERN	+ Overall circulation improvements; related side-street impacts	+ + + Major upgrades to highway segments and interconnected side streets

US 20 CIRCULATION OPTIONS

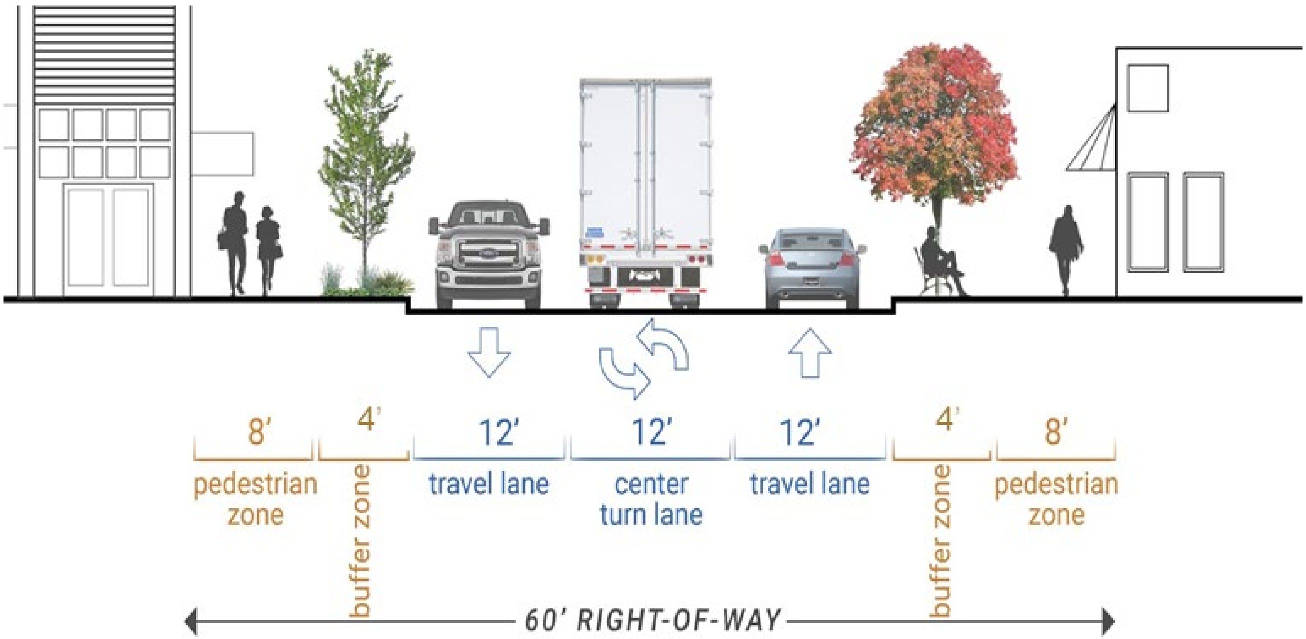
US 20 is the primary route that connects Newport east to Corvallis and other regional destinations along I-5. The existing three-lane section leads to significant congestion in the summer for traffic entering Newport that must turn at the US 101/US 20 intersection. The long vehicle queues approaching the US 101/US 20 signal reduce business access and increase delay for the existing, unsignalized intersections along US 20. Congestion on US 20 coupled with limited right-of-way and poor multimodal facilities also creates significant challenges for all users. Today, there are only narrow, curb-tight sidewalks for a portion of the corridor, no bicycle facilities, and limited opportunities for future widening to relieve congestion.

Two circulation options were considered for US 20 as part of the TSP. The first option maintains the existing alignment of US 20 in downtown Newport but includes several streetscape alternatives to enhance the bicycle or pedestrian environment. The second option constructs a couplet on US 20 between NE Harney Street/SE Moore Drive and US 101. This option would place westbound traffic on NE 1st Street while eastbound traffic would remain on the existing alignment of US 20; US 20 westbound would tie back into the existing alignment prior to the US 101/US 20 intersection. Converting US 20 to a couplet increases the total available right-of-way and allows wider sidewalks with protected bike facilities to be implemented along the corridor. This option also increases the total number of properties that front US 20 which may increase economic development opportunities for downtown Newport although US 20 is located outside of Newport's historic downtown core.

The circulation options were evaluated both quantitatively and qualitatively for their impact on pedestrian travel, bicycle travel, vehicle operations, economic redevelopment opportunities, streetscape opportunities, and cost. These options were also presented to the public at a series of online open houses and advisory committee meetings to gauge acceptance of the desired approach to circulation for US 20. Through the evaluation process, maintaining two-way traffic on US 20, seen below in Figure 39, emerged as the preferred alternative. This option would include on-street bike facilities between NE Harney Street and NE Fogarty Street, but would include no bike facilities west of NE Fogarty Street to US 101. Given the gap in bike facilities along US 20, parallel bike facilities would provide adjacent routes to the north along NE 1st Street and to the south along SE 1st Street, connected by a bridge over the ravine between Douglas Street and Fogarty Street. Enhanced crossings at NE Eads Street and NE Fogarty Street would also provide north/south connectivity for the parallel routes. A summary of the full evaluation for each US 20 circulation option is included in Appendix H. Although this is the preferred cross section, US 20 is a Freight route and a Reduction Review route and will be subject to further review by ODOT.

Improving the existing streetscape on US 20 will improve segments of the bicycle and pedestrian environment at a comparably low cost. Although a couplet would increase vehicle capacity on US 20, the right-of-way needed to upgrade NE 1st Street and implement improvements at the US 101/US 20 signal outweigh the potential benefits of a couplet. Retaining the existing alignment of US 20 can improve segments of the bicycle and pedestrian environment while minimizing the negative impacts to the surrounding residential neighborhood.

FIGURE 39: PREFERRED US 20 CIRCULATION OPTION



US 101/US 20 INTERSECTION OPTIONS

Several improvement options were considered at the US 101/US 20 intersection. This intersection experiences high delay during the peak periods today, and the delay is forecasted to worsen in the future. High volumes on each approach to the intersection limit the potential for cost effective signal timing or other minor modifications to manage congestion. Alternatives considered included a two-lane roundabout and restricting the Olive Street approach to a single direction (i.e., westbound only), but ultimately adding a second southbound left turn lane from US 101 to eastbound US 20 emerged as the preferred option. This improvement will widen the southbound US 101 approach to US 20 to include six lanes (two southbound through lanes, two southbound left-turn lanes, and two northbound lanes), will require widening along US 20 to include a second receiving lane, and will enhance sidewalks and add bike lanes near the intersection. These improvements will likely have significant impacts to properties surrounding the intersection. While the concepts have highlighted the potential property impacts, they are only illustrative at this stage of the planning process and will be fully vetted and ultimately determined during the engineering design process prior to the construction drawings. It is worth noting that the PAC prefers a widening option that focuses the US 101 widening to the east, although the option will still impact adjacent properties.

HARNEY STREET EXTENSION

Newport does not have a parallel route on the east side of US 101 to connect northern areas of the city to the downtown core, so most vehicle trips between these areas must occur on US 101. The Harney Street Extension proposes a new minor arterial road between NE 7th Street and NE Big Creek Road before connecting to US 101 at the proposed NE 36th Street traffic signal. This extension will provide a continuous connection between US 20 and NE 36th Street with limited access to amenities along US 101 north of NE 7th Street and allow travelers to bypass some of the most congested segments of US 101. The Harney Street extension will also provide a critical connection to serve future growth in this area.

The Harney Street extension was previously identified in long-range transportation plans, but this special study included additional refinement to understand the costs and benefits of this improvement. Figure 40 illustrates the refined project concept. The extension was evaluated both quantitatively and qualitatively for its impact on pedestrian travel, bicycle travel, vehicle operations, and cost. A summary of the full evaluation is included in Appendix H, with conceptual details included in Appendix Q.

Due to the limited access to amenities along US 101 in Newport from the Harney Street extension, this road will primarily serve regional traffic travelling between US 20 and US 101 to the north of Newport along with future residential growth that is projected to occur along the proposed alignment. Between 4,000 and 7,000 vehicles are expected to use this extension by 2040 which will provide only modest relief for congestion on US 101 in Newport. However, this street extension will also include pedestrian and bicycle facilities to connect to Newport's planned network, significantly enhancing travel for these modes. The Harney Street extension will enhance local circulation for Newport although the high project cost makes this a lower priority improvement for Newport.

FIGURE 40: HARNEY STREET EXTENSION CONCEPTUAL ALIGNMENT

ALTERNATIVE HIGHWAY MOBILITY TARGETS

Assuming Newport grows in accordance with its current adopted land use plan and travelers continue to rely heavily on private automobiles for their trips, roadways in the City will not be able to meet ODOT's v/c ratio-based mobility targets in the Oregon Highway Plan. In this situation (which is common in communities with roadways that experience high travel demands), adoption of alternative mobility targets is appropriate. Alternative mobility targets reflect realistic expectations for roadway performance at the end of the 20-year planning horizon, based on traffic projections. Adopting realistic alternative targets relieves the state and local governments from having to limit development or make investments to comply with targets they cannot possibly achieve. More information can be found in Appendix K (Technical Memorandum #11: Alternate Mobility Targets).

Chapter 6: Projects and Priorities

This chapter describes the transportation system improvement projects identified to address the system needs discussed in Chapter 3.

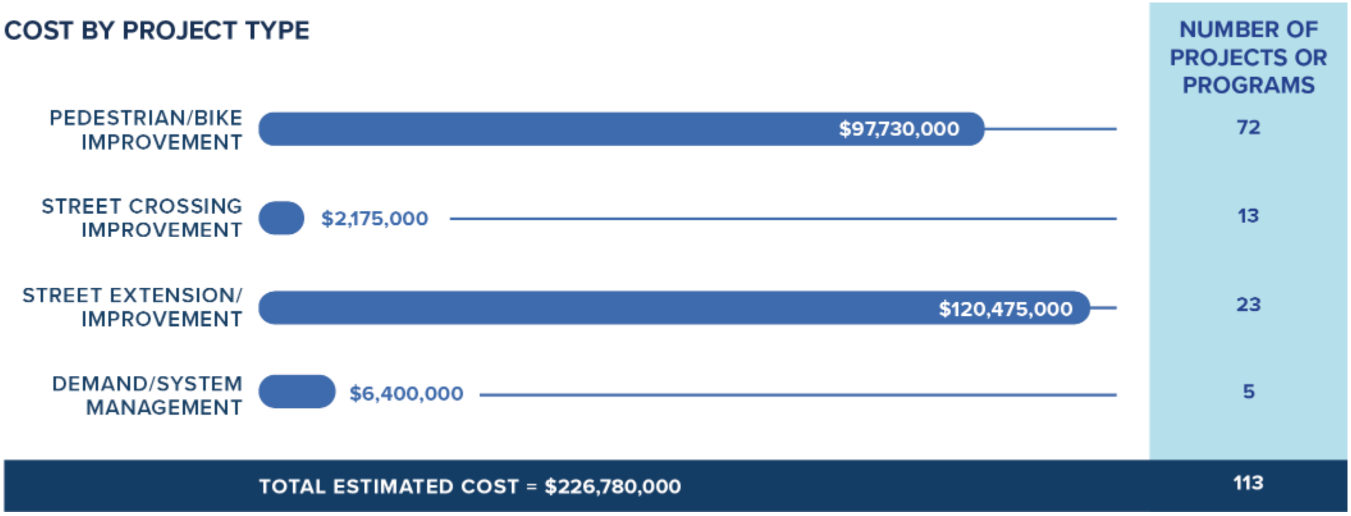
ASPIRATIONAL PROJECTS

The full aspirational list includes 113 projects totaling over $227 million in total investments (see Figure 41). For the purposes of cost estimates, project design elements are identified, however, the actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City, ODOT and/or other partner agency approval. The Aspirational projects were assigned to one of several categories:

- **Street Extension/Street Improvement** – these projects will improve or construct new multi-modal streets and intersections throughout the UGB, each with facilities for motorists, pedestrians and bicyclists. They are listed with project identification numbers beginning with "INT", "EXT" and "REV". The TSP includes a total of 23 projects that, as of 2021, will cost an estimated $120.4 million to complete.
- **Pedestrian/ Bike Improvement** – these projects include stand-alone sidewalk, path and an integrated network of bicycle lanes, marked on-street routes and shared-use paths to facilitate safe and convenient travel citywide. They are listed with project identification numbers beginning with "SW", "TR", "BR", "SBL" and "BL". A total of 72 pedestrian and bicycle projects were identified that, as of 2021, will cost an estimated $97.7 million to complete.
- **Street Crossing Improvement** – these projects will improve safety and mobility at street crossings throughout the UGB. They are listed with project identification numbers beginning with "CR". A total of 13 projects were identified to construct new or improve existing crossings that, as of 2021, will cost an estimated $2.2 million to complete.
- **Demand/ System Management** – these projects will encourage more efficient usage of the transportation system. They are listed with project identification numbers beginning with "PRO". The TSP includes five projects that, as of 2021, will cost an estimated $6.4 million.

Note that the Newport Beach Access Resiliency Plan includes additional projects to improve access, however, no specific TSP projects were added.

FIGURE 41: LEVEL OF INVESTMENT BY MODE OF TRAVEL



PRIORITIZING ASPIRATIONAL PROJECTS

Unless the City expands its funding options, most of the Aspirational projects identified are not reasonably likely to be funded by 2040. For this reason, projects from the Aspirational list were evaluated and ranked using a set of evaluation criteria that reflect how well it achieves the transportation goals and objectives described in Chapter 2. The prioritization score was calculated for each project using the criteria associated with 8 of the 9 TSP goals. TSP Goal 9 (Work with Regional Partners) did not have any associated criteria and was therefore not a factor in the evaluation score calculation.

There was a total of 13 criteria overall associated with the TSP Goals, as some goals had more than one criterion. The projects were initially given a score of 1 (one) for each of the 13 criteria it addressed, with each goal weighted equally, resulting in overall possible scores ranging from 0 to 8. Projects were then assigned an evaluation rank of "high" for projects with the highest total scores, "medium" for the middle one-third of project scores, and "low" for projects with the lowest total scores (see Table 10). The methodology for calculating the scores for each criterion can be found in Technical Memorandum #8 in the Appendix.

The final priority ranks listed in Table 10 were used to divide projects from the Aspirational project list into two improvement packages, referred to as Financially Constrained and Unconstrained (see descriptions of these improvement packages in the following sections). The project priority rankings do not create an obligation to construct projects in any order and it is recognized that these priorities may change over time. The City of Newport will use the priorities listed in this TSP to guide investment decisions but will also regularly reassess local priorities to leverage new opportunities and reflect evolving community interests.

The City is not required to implement projects identified on the Financially Constrained list first. Priorities may change over time and unexpected opportunities may arise to fund particular projects. The City is free to pursue any of these opportunities at any time. The purpose of the

Financially Constrained project list is to establish reasonable expectations for the level of improvements that will occur and give the City initial direction on where funds should be allocated.

FINANCIALLY CONSTRAINED PROJECTS

Financially Constrained projects are the most valued, in terms of how they meet critical needs and how well they work to deliver on community goals. Projects in this group have a total construction budget that is similar to the reasonably available funding over the planning horizon, meaning the $76 million that is likely to be available through existing City and State funding sources. This package also includes the $3 million in additional funding from the South Beach Urban Renewal District for remaining projects in the district boundary, beyond the $76 million.

The projects included in the Financially Constrained list are shown in Table 10 and Figure 42, Figure 43, Figure 44, Figure 45, Figure 46 and Figure 47. These projects were grouped within the following priority horizons, based on the overall project evaluation score and available funding:

- **Tier 1:** Projects recommended for implementation within 1 to 10 years.
- **Tier 2:** Projects likely to be implemented beyond 10 years.

UNCONSTRAINED PROJECTS

Unconstrained projects are those remaining from the Aspirational list that likely will not include funding by 2040. The projects included in the Unconstrained list are shown in Table 10 and Figure 42, Figure 43, Figure 44, Figure 45, Figure 46 and Figure 47. These projects were grouped within the following priority horizons, based on the project evaluation score:

- **Unconstrained Tier 3:** Projects with the highest priority for implementation beyond the projects included on the Financially Constrained list, should additional funding become available.
- **Unconstrained Tier 4:** The last phase of projects to be implemented, should additional funding become available.

ASPIRATIONAL PROJECT TABLE AND FIGURES

The Aspirational projects listed in Table 10 are also displayed on Figure 42, Figure 43, Figure 44, Figure 45, Figure 46 and Figure 47, with the corresponding figure shown in the column labeled "Map Area" (i.e., North, Downtown or South). Multimodal projects (i.e., "SW", "TR", "BR", "SBL", "BL" and "CR" labels) and motor vehicle projects (i.e., "INT", "EXT" and "REV" labels) are displayed on separate figures in each map area. The "north area" maps are shown in Figure 42 and Figure 43, the "downtown area" maps shown in Figure 44 and Figure 45, and the "south area" maps shown in Figure 46 and Figure 47.

The project identification numbers in the first column are coded to indicate the category of the improvement, as follows:

- "INT" to represent an intersection improvement project
- "EXT" to represent a roadway extension project
- "REV" to represent an existing roadway improvement or reconfiguration project
- "SW" to represent a sidewalk improvement project
- "TR" to represent a trail or shared use path improvement project
- "BR" to represent a bike route improvement project
- "SBL" to represent an improvement project to add separated or buffered bike lanes
- "BL" to represent an improvement project to add standard bike lanes
- "CR" to represent a roadway crossing improvement project
- "PRO" to represent a citywide demand or system management project

The improvement package for each Aspirational project is shown in the column labeled "Package", and is either Financially Constrained (i.e., projects likely to be funded) or Unconstrained (i.e., projects not likely to be funded).

TABLE 10: ASPIRATIONAL PROJECTS

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
INT1	**US 101/NE 73rd Street** Improve the intersection with either a traffic signal or roundabout. Cost assumes installation of a traffic signal. Evaluate the need for a short-term interim pedestrian crossing improvement.	State	City/State Funds	$950,000	Medium	1,2,4,8	Unconstrained	Unconstrained Tier 4	North
INT3	**US 101/NW Oceanview Drive** Widen the eastbound NW Oceanview Drive approach to include separate left and right turn lanes.	State	NURA	$225,000	Low	2,8	Unconstrained	Unconstrained Tier 4	North
INT4	**US 101/US 20** Construct a second southbound left turn lane. Requires a signal modification, widening along US 101 and along the south side of US 20 to support a second receiving lane, and conversion of the US 101/NE 1st Street intersection to right-in, right-out movements only.	State	NURA	$5,000,000	High	1,2,4,7, 8	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
INT6	**US 20/SE Moore Drive/NE Harney Street** Improve the intersection with a rebuilt traffic signal, and separate left turn lanes on the northbound and southbound approaches. Coordinate improvements with Project SBL1.	State	NURA	$4,000,000	Medium	1,2,4,8	Financially Constrained	Tier 1	Downtown
INT8	**US 101/NE 36th Street** Improve the intersection with either a traffic signal (with separate left and right turn lanes for westbound traffic) or a roundabout. Cost assumes installation of a traffic signal.	State	City/State Funds	$1,175,000	Medium	1,2,4,8	Unconstrained	Unconstrained Tier 4	North
INT9	**US 101/SW 40th Street** Improve the intersection with a traffic signal or roundabout. Cost assumes installation of a traffic signal, curb ramps, striping, signing and repaving, as identified in the South Beach Refinement Plan.	State	SBURA	$1,550,000	High	1,2,4,7, 8	Financially Constrained	Tier 1	South
INT10	**US 20/Benton Street** Restripe northbound approach to include separate left/through lane and right turn lane (requires removal of on-street parking).	State	NURA	$75,000	Low	2,8	Unconstrained	Unconstrained Tier 4	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
INT11	**US 101/NW-NE 6th Street** Realign NW 6th Street to the north and/or NE 6th Street to the south to create a standard 4-leg intersection. Requires right-of-way acquisition and a signal rebuild.	State	NURA	$3,075,000	Low	1,2,4	Unconstrained	Unconstrained Tier 4	Downtown
INT12	**US 101/NE 57th Street** Realign approach to intersect with NW 58th Street and restripe the side street approaches to include left turn lanes.	State	NURA	$1,275,000	Low	1,2	Unconstrained	Unconstrained Tier 4	North
EXT1	**NW Gladys Street (from NW 55th Street to NW 60th Street)** Improve NW Gladys Street to create a continuous neighborhood collector street.	Newport	NURA	$1,100,000	Medium	1,2,3,6	Financially Constrained	Tier 2	North
EXT3	**NE 6th Street (from NE Laurel Street to NE Newport Heights Drive)** Extend NE 6th Street to create a continuous neighborhood collector street.	Newport	City/State Funds	$5,200,000	Low	2,3,7	Unconstrained	Unconstrained Tier 4	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
EXT4	**NE Harney Street (from NE 7th Street to NE Big Creek Road)** Extend NE Harney Street to create a continuous major collector street and install a mini roundabout at the intersection of NE Harney Street/NE 7th Street.	Newport	City/State Funds	$58,600,000	High	2,3,4,6,7	Unconstrained	Unconstrained Tier 3	North, Downtown
EXT8	**SE Ash Street-SE Ferry Slip Road (from SE 40th Street to SE 42nd Street)** Extend SE Ash Street-SE Ferry Slip Road to create a continuous major collector street.	Newport	City/State Funds	$2,275,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	South
EXT9	**SE 50th Place (from Emery Trailhead to US 101)** Extend SE 50th Place to the entrance of South Beach State Park at US 101 to create a continuous major collector street. Cost includes the construction of a shared use path on one side and widening of US 101 to create a southbound left turn lane.	Newport	City/State Funds	$3,375,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	South

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
EXT10	**SE 62nd Street (from current terminus to SE 50th Place)** Extend SE 62nd Street from the current terminus to SE 50th Place, near Emery Trailhead, to create a continuous major collector street. Cost includes the construction of a shared use path on one side.	Newport	City/State Funds	$6,150,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	South
EXT11	**SE Harborton Street (from SE College Way to SE 62nd Street extension)** Extend SE Harborton Street to the SE 62nd Street extension intersection with SE 50th Place to create a continuous major collector street. Cost includes the construction of a shared use path on one side.	Newport	City/State Funds	$4,000,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	South

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
EXT12	**NW Nye Street (from NW Oceanview Drive to NW 15th Street)** Extend/Improve NW Nye Street to create a continuous neighborhood collector street between NW Oceanview Drive and NW 15th Street. Cost assumes bridge will be needed, installation of a sidewalk, and signing and striping as needed to designate a shared bike route. Project EXT12 will only be constructed if the full street connection is preferred over the shared-use path only option (Project TR14).	Newport	City/State Funds	$3,100,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
REV1	**NW Oceanview Drive (from NW Nye Street Extension to NW 12th Street)** Convert NW Oceanview Drive to one-way southbound between the NW Nye Street Extension and NW 12th Street and shift northbound vehicle traffic to NW Nye Street. Cost assumes utilization of the existing roadway width to include a southbound travel lane for vehicles, and an adjacent shared use path for pedestrians and bicycles. Project EXT12 must be completed as a full street extension and must be constructed first for REV1 to be constructed.	Newport	City/State Funds	$350,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North, Downtown
REV2	**NW 55th Street (from NW Gladys Street to NW Pinery Street)** Improve the roadway surface. Project to be coordinated with Project BR16 and SW24.	City	NURA	$200,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North
REV3	**NE Eads Street (from NE 3rd Street to NE 6th Street)** Add curb extensions and improve lighting, to allow through vehicle movement without street closure during the school year.	City	City/State Funds	$100,000	Medium	1,2,3,6, 8	Unconstrained	Unconstrained Tier 3	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
REV5	**Yaquina Bay Bridge Refinement Plan** Conduct a study to identify the preferred alignment of a replacement bridge, typical cross-section, implementation, and feasibility, and implement long-term recommendations from the Oregon Coast Bike Route Plan.	State	City/State Funds	$500,000	High	2,3,4,6, 7,8	Financially Constrained	Tier 1	Downtown, South
REV6	**US 101 and SW 9th Street (from SW Abbey Street to SW Angle Street)** Provide an enhanced two-way version of US 101, or convert US 101 to one-way southbound between SW Abbey Street and SW Angle Street, and shift northbound US 101 to SW 9th Street. Cost assumes cross-sections as identified in Chapter 5 of this TSP, construction of new roadway segments to transition northbound traffic to and from SW 9th Street, and some intersection and crossing improvements. Specific treatments will be identified during design phase of the project.	State	NURA	$11,700,000	High	2,3,4,6, 7,8	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
REV7	**US 20 (from US 101 to NE Harney Street)** Enhance the existing street cross-section with widened sidewalks and new landscape buffers. Cost assumes cross-sections as identified in Chapter 5 of this TSP, with on-street bicycle lanes only provided between SE Fogarty Street and NE Harney Street. Requires a design exception and documented public acceptance. Parallel bicycle facilities provided between US 101 and SE Fogarty Street in Project BR5, TR12 and BL3.	State	NURA	$6,500,000	High	2,3,4,6, 7,8	Financially Constrained	Tier 1	Downtown
SW1	**NW 3rd Street (from NW Brook Street to NW Nye Street)** Complete existing sidewalk gaps using either standard sidewalk widths or restripe to provide a designated pedestrian walkway in-street.	Newport	City/State Funds	$1,100,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 3	Downtown
SW2	**NE 3rd Street (from NE Eads Street to NE Harney Street)** Complete existing sidewalk gaps.	Newport/ Lincoln County	City/State Funds	$950,000	Medium	1,2,3,6	Financially Constrained	Tier 2	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
SW3	**SW Elizabeth Street (from W Olive Street to SW Government Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$2,600,000	Medium	1,2,3,6	Financially Constrained	Tier 2	Downtown
SW6	**NE 7th Street (from NE Eads Street to NE 6th Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$2,175,000	Medium	1,2,3,6	Financially Constrained	Tier 2	Downtown
SW8	**NE Harney Street (from US 20 to NE 3rd Street)** Complete existing sidewalk gaps.	Newport	NURA	$700,000	Medium	1,2,3,6	Financially Constrained	Tier 2	Downtown
SW11	**SE Benton Street/SE 2nd Street/SE Coos Street/NE Benton Street (from SE 10th Street to NE 12th Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$3,050,000	Medium	2,3,6,8	Financially Constrained	Tier 2	North, Downtown
SW12	**SW 2nd Street (from SW Elizabeth Street to SW Nye Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$1,275,000	Medium	1,2,3,6	Financially Constrained	Tier 2	Downtown
SW13	**NW Nye Street (from W Olive Street to NW 15th Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$4,450,000	Medium	2,3,6,8	Financially Constrained	Tier 2	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
SW14	**NW/NE 11th Street (from NW Spring Street to NE Eads Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$2,150,000	Low	2,3,6	Financially Constrained	Tier 2	North, Downtown
SW16	**NW Edenview Way/NE 20th Street (from NW Oceanview Drive to NE Crestview Drive)** Complete existing sidewalk gaps.	Newport	City/State Funds	$2,475,000	Medium	1,2,3,6	Financially Constrained	Tier 2	North
SW17	**NW 60th Street (from US 101 to NW Gladys Street)** Complete existing sidewalk gaps.	Newport	NURA	$175,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	North
SW18	**SE 35th Street (from SE Ferry Slip Road to South Beach Manor Memory Care)** Complete existing sidewalk gaps as identified in the South Beach Refinement Plan.	Newport	SBURA	$750,000	High	1,2,3,6, 7	Financially Constrained	Tier 1	South
SW19	**NW 8th Street/NW Spring Street (from NW Coast Street to NW 11th Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$1,175,000	Low	2,3,6	Financially Constrained	Tier 2	North, Downtown
SW20	**NW Gladys Street/NW 55th Street (from NW 60th Street to US 101)** Complete existing sidewalk gaps.	Newport	NURA	$1,425,000	Medium	2,3,6,8	Financially Constrained	Tier 2	North

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
SW21	**US 101 (from NW 25th Street to NE 31st Street)** Construct pedestrian path on east side of US 101. Cost assumes 10-ft wide sidewalk with sheet pile wall.	State	NURA	$3,100,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North
SW22	**Yaquina Bay State Park Drive (from SW Elizabeth Street to SW Naterlin Drive)** Complete existing sidewalk gaps and install enhanced pedestrian crossings consistent with the Yaquina Bay State Recreation Site Master Plan.	Newport	State Funds	$2,250,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 4	Downtown
SW23	**SW Bay Boulevard (from SE Fogarty Street to SE Moore Drive)** Complete existing sidewalk gaps.	Newport	City/State Funds	$1,300,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 4	Downtown
SW24	**NW 55th Street (from NW Gladys Street to NW Piney Street)** Complete existing sidewalk gaps. Coordinate with Project REV2.	Newport	NURA	$1,775,000	Medium	2,3,6,8	Unconstrained	Unconstrained Tier 3	North
SW25	**NE Harney Street/NE 36th Street (from US 101 to NE Big Creek Road)** Complete existing sidewalk gaps.	Newport	City/State Funds	$5,300,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	North

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
SW26	**NE Avery Street/NE 71st Street (from US 101 to NE Echo Court)** Complete existing sidewalk gaps.	Newport	City/State Funds	$2,475,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	North
SW27	**NE 12th Street (from US 101 to NE Benton Street)** Complete existing sidewalk gaps.	Newport	City/State Funds	$625,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	North, Downtown
SW28	**SW Bayley Street (SW Elizabeth Street to US 101)** Complete existing sidewalk gaps.	Newport	NURA	$325,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	Downtown
SW29	**US 101 (from SE Ferry Slip Road to SE 40th Street)** Complete the sidewalk gaps on the east side.	State	City/State Funds	$425,000	Medium	1,2,3,6	Financially Constrained	Tier 2	South
SW30	**Yaquina Bay Road (from SE Vista Drive to SE Running Spring)** Complete existing sidewalk gaps on north side only.	Newport	City/State Funds	$1,800,000	Low	2,3,6	Unconstrained	Unconstrained Tier 4	Downtown
SW31	**SW Abalone Street (from US 101 to SW 35th Street)** Construct a sidewalk on the south side of SW Abalone Street.	Newport	City/State Funds	$350,000	Medium	2,3,4,6	Unconstrained	Unconstrained Tier 4	South

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
TR1	**NW Oceanview Drive (from US 101 to NW Nye Street Extension)** Construct a shared use path on one side. The short term improvement along this segment included in Project BR15.	Newport	City/State Funds	$4,775,000	High	1,2,3,6	Financially Constrained	Tier 1	North
TR2	**US 101 (from NW Lighthouse Drive to 600 feet north of NW 77th Court)** Construct a shared use path on the east side of US 101. Sidewalk infill will also be completed on the west side south of NW 60th Street. Shared use path project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path).	State	NURA	$6,650,000	High	1,2,3,6, 7	Unconstrained	Unconstrained Tier 3	North

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
TR3	**US 101 (from NW Lighthouse Drive to NW Oceanview Drive)** Construct a shared use path on the west side of US 101, with sidewalk infill on the east side. Shared use path project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path). Cost included with Project TR8.	State	Federal Funds/ NURA	Included with Project TR8	High	1,2,3,4, 6,7	Financially Constrained	Tier 1	North
TR4	**US 101 (from SE 35th Street to SE 40th Street)** Construct a shared use path on the west side of US 101.	State	City/State Funds	$500,000	Medium	1,2,3,7	Unconstrained	Unconstrained Tier 3	South
TR5	**US 101 (from SE 40th Street to South UGB)** Construct a shared use path on the west side of US 101.	State	City/State Funds	$5,500,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 4	South
TR6	**NE Big Creek Road (from NE Fogarty Street to NE Harney Street)** Reconfigure the roadway to provide a shared use path. Cost assumes utilization of the existing roadway width to include a one-way 12 ft. travel lane and an adjacent shared use path.	Newport	City/State Funds	$450,000	High	2,3,4,5, 6,7	Financially Constrained	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
TR7	**Water Tank Trail (from Newport Water Tank to Communications Hill Trail)** Construct a shared use path between the Newport Water Tank and the Communications Hill Trail, as identified by the BLM/FHWA. Cost included with Project TR8.	Newport	Federal Funds/ NURA	Included with Project TR8	Medium	1,2,3,6	Financially Constrained	Tier 1	North
TR8	**NW Lighthouse Drive (from US 101 to terminus)** Construct a shared use path on one side and other improvements as identified by the BLM/FHWA. Cost includes pedestrian/bicycle crossing improvements at the intersection of US 101/NW Lighthouse Drive, and Projects TR3 and TR7.	State	Federal Funds/ NURA	$4,000,000	Medium	2,3,6	Financially Constrained	Tier 1	North
TR9	**SE 40th Street (from US 101 to SE Harborton Street)** Construct a shared use path on one side to complete existing gap.	Newport	City/State Funds	$675,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 3	South
TR10	**US 101 (from NW Oceanview Drive to NW 25th Street)** Construct a shared use path along US 101. Note the side and extents are subject to further consideration.	State	NURA	$5,275,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 3	North

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
TR11	**SW Alder Street/SW Neff Way (from SW 2nd Street to US 101)** Construct a shared use path or sidewalk along one side. Note the side is subject to further consideration.	Newport	City/State Funds	$500,000	Medium	1,2,3,4, 6	Unconstrained	Unconstrained Tier 3	Downtown
TR12	**SE 1st Street (from SE Douglas Street to SE Fogarty Street)** Construct a shared use path. Cost assumes bridge will be needed.	Newport	NURA	$2,550,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown
TR13	**South Beach Improvements** Pedestrian and bicycle priority improvements as identified in the South Beach Refinement Plan. This project does not include the cost associated with Project SW18.	Newport	SBURA	$700,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	South
TR14	**NW Nye Street (from NW Oceanview Drive to NW Nye Street)** Construct a shared use path. Cost assumes bridge will be needed. Project TR14 will only be constructed if the full street connection is not constructed (Project EXT12).	Newport	City/State Funds	Included with Project EXT12	Medium	1,2,3,6	Financially Constrained	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BR1	**NE 12th Street (from NE Benton Street to NE Fogarty Street)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$25,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North, Downtown
BR2	**NE Harney Street/NE 36th Street (from NE Big Creek Road to US 101)** Install signing and striping as needed to designate as interim shared bike route. Long term, on-street bike lanes to be provided as part of the Harney Street extension (Project EXT4). Cost assumes interim improvement only.	Newport	City/State Funds	$75,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North
BR3	**NE Eads Street (from NE 1st Street to NE 12th Street)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North, Downtown
BR4	**Yaquina Bay State Park Drive (from SW Elizabeth Street to SW Naterlin Drive)** Install signing and striping as needed to designate a bike route, consistent with the Yaquina Bay State Recreation Site Master Plan.	State	State Funds	$50,000	Medium	2,3,6,8	Unconstrained	Unconstrained Tier 4	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BR5	**SE 1st Street (from SE Coos Street to SE Fogarty Street), SE Fogarty Street (from US 20 to SE 2nd Street), and SE 2nd Street (SE Fogarty Street to SE Moore Drive)** Install signing and striping as needed to designate a bike route. Project TR12 must be completed before/with Project BR5.	City	NURA	$25,000	High	2,3,4,6, 8	Financially Constrained	Tier 1	Downtown
BR7	**SW 2nd Street/SW Angle Street (from SW Elizabeth Street to SW 10th Street)** Install signing and striping as needed to designate a bike route. Specific intersection treatments at US 101 and SW 9th Street intersections to be determined with Project REV6.	Newport	City/State Funds	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	Downtown
BR9	**NW Edenview Way/NE 20th Street (from NW Oceanview Drive to NW Crestview Drive)** Install signing and striping as needed to designate a bike route. Restripe through US 101/NE 20th Street intersection to provide on-street bike lanes between the NW Edenview Way/NW 20th Street intersection and the eastern Fred Meyer Driveway.	Newport	City/State Funds	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BR10	**NW 60th Street/NW Gladys Street/NW 55th Street (from US 101 to US 101)** Install signing and striping as needed to designate a bike route through Agate Beach.	Newport	NURA	$25,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North
BR12	**NE Avery Street/NE 71st Street (from US 101 to NE Echo Court)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North
BR13	**NW 3rd Street (from US 101 to NW Cliff Street)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	Downtown
BR14	**Yaquina Bay Bridge Interim Improvements** Install signing as needed to designate a bike route and implement other improvements as identified in the Oregon Coast Bike Route Plan such as flashing warning lights or advisory speed signs.	State	City/State Funds	$75,000	High	1,2,3,6, 8	Financially Constrained	Tier 1	South

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BR15	**NW Oceanview Drive Interim Improvements (from US 101 to NW Nye Street Extension)** Install signing and striping as needed to designate as an interim bike route and implement other improvements as identified in the Oregon Coast Bike Route Plan. Long term improvement along this segment included in Project TR1.	Newport	City/State Funds	$75,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North
BR16	**NW 55th Street (from NW Gladys Street to NW Pinery Street)** Install signing and striping as needed to designate a bike route. Coordinate with Project REV2.	Newport	NURA	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North
BR17	**NW 6th Street (from NW Coast Street to NW Nye Street)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$25,000	Medium	2,3,6,8	Financially Constrained	Tier 1	Downtown
BR18	**NE 7th Street/NE 6th Street (from NE Eads Street to NE Laurel Street)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$50,000	Medium	2,3,6,8	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BR19	**NW Spring Street/NW Coast Street (from NW 12th Street to SW 2nd Street)** Install signing and striping as needed to designate a bike route.	Newport	City/State Funds	$75,000	Medium	2,3,6,8	Financially Constrained	Tier 1	North, Downtown
SBL1	**SE Moore Drive/NE Harney Street (from SE Bay Boulevard to NE 7th Street)** Restripe to install buffered bike lanes between SE Bay Boulevard and US 20; Widen to install buffered bike lanes between US 20 and NE Yaquina Heights Drive; Restripe and upgrade the existing on-street bike lanes between NE Yaquina Heights Drive and NE 7th Street (project removes on-street parking on one side only). Coordinate improvements through the US 20 intersection with Project INT6.	Newport	NURA	$825,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown
SBL2	**US 101 (from Yaquina Bay Bridge to SW Abbey Street)** Construct a separated bicycle facility on US 101. Note the specified facility design and project extents are subject to review and modification.	State	NURA	$1,350,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
SBL3	**US 101 (from SW Angle Street to NW 25th Street)** Construct a separated bicycle facility on US 101. Note the specified facility design and project extents are subject to review and modification.	State	NURA	$5,915,000	High	1,2,3,4, 6	Unconstrained	Unconstrained Tier 3	North, Downtown
SBL4	**US 101 (from Yaquina Bay Bridge to SE 35th Street)** Construct a separated bicycle facility on US 101. Note the specified facility design and project extents are subject to review and modification.	State	City/State Funds	$925,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	South
BL1	**SW Canyon Way (from SW 9th Street to SW Bay Boulevard)** Restripe to provide on-street bike lanes in uphill direction and mark sharrows in the downhill direction (project may require conversion of angle parking near SW Bay Boulevard to parallel parking).	Newport	City/State Funds	$25,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BL2	**NW Nye Street/SW 7th Street (from NW 15th Street to SW Hurbert Street)** Restripe NW Nye Street to include on-street bicycle lanes (project removes on-street parking on one side only) between NW 15th Street and SW 2nd Street. Install signing and striping to designate SW 7th Street a shared bike route between SW 2nd Street and SW Hurbert Street.	Newport	City/State Funds	$100,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	North, Downtown
BL3	**NE 1st Street (from US 101/NE 1st Street intersection to US 20/NE Fogarty Street intersection)** Restripe to provide on-street bike lanes (project removes on-street parking on one side).	Newport	NURA	$100,000	High	1,2,3,4, 6,7	Financially Constrained	Tier 1	Downtown
BL4	**SW 9th Street (from US 101 to SW Fall Street)** Restripe or widen as needed to provide on-street bike lanes (project removes on-street parking).	Newport	NURA	$465,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BL5	**SW Bayley Street (from US 101 to SW Elizabeth Street)** Restripe to provide on-street bike lanes (project removes on-street parking on one side).	Newport	NURA	$25,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
BL6	**SW Hurbert Street (from SW 9th Street to SW 2nd Street)** Restripe to provide on-street bike lanes (existing angle parking will be converted to parallel parking on one side). Specific intersection treatments at US 101 and SW 9th Street intersections to be determined with Project REV6.	Newport	NURA	$25,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown
BL7	**NW/NE 6th Street (from NW Nye Street to NE Eads Street)** Restripe or widen as needed to provide on-street bike lanes (project removes on-street parking on one side).	Newport	City/State Funds	$775,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
BL8	**NW/NE 11th Street (from NW Spring Street to NE Eads Street)** Restripe to provide on-street bike lanes (project removes on-street parking on one side, although on-street parking may be impacted on both sides between NW Lake Street and NW Nye Street).	Newport	City/State Funds	$50,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BL9	**NE 3rd Street (from NE Eads Street to NE Harney Street)** Widen as needed to provide on-street bike lanes.	Newport/ Lincoln County	City/State Funds	$525,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
BL10	**NE Yaquina Heights Drive (from NE Harney Street to US 20)** Widen as needed to provide on-street bike lanes.	Newport	City/State Funds	$8,075,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 3	Downtown
BL11	**SW Angle Street/SW 10th Street/SE 2nd Street/SE Coos Street/NE Benton Street (from SW 9th Street to Frank Wade Park)** Restripe to provide on-street bike lanes (project removes on-street parking on one side between NE 12th Street and US 20). Install signing and striping to designate NE Benton Street a shared bike route between NE 12th Street and NE Chambers Street/Frank Wade Park. Note 5 ft. bike lanes assumed between US 20 and SE 2nd Street. Construct with Project CR2.	Newport	City/State Funds	$150,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
BL12	**SW Elizabeth Street (from SW Government Street to W Olive Street)** Restripe to provide on-street bike lanes (project removes on-street parking on one side).	Newport	City/State Funds	$75,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
BL13	**W Olive Street (from SW Elizabeth Street to US 101)** Restripe to provide on-street bike lanes (project removes on-street parking on one side). Note project requires modification of existing curb extensions at Coast Street; on-street bike lanes may terminate prior to the US 101 intersection to provide space for turn pockets.	Newport	City/State Funds	$150,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
BL14	**Yaquina Bay Road (from SE Moore Drive to SE Running Spring)** Restripe or widen as needed to provide on-street bike lanes.	Newport	City/State Funds	$1,625,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
CR1	**NW 60th Street/US 101** Install an enhanced pedestrian and bike crossing to connect to the shared-use path on the east side of US 101.	State	NURA	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North
CR2	**SE Coos Street/US 20** Install an enhanced pedestrian and bicycle route crossing. Construct with Project BL11.	State	NURA	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
CR3	**NW 55th Street/US 101** Install an enhanced pedestrian and bike crossing to connect to the shared-use path on the east side of US 101.	State	NURA	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North
CR4	**NE Fogarty Street/US 20** Install an enhanced pedestrian and bicycle route crossing. This intersection should be designed to facilitate bicycle turn movements from US 20 on-street bike facilities to/from parallel bike facilities on side streets to the north and south. Construct with Project BR5 and/or Project BL3.	State	NURA	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	Downtown
CR5	**NW Oceanview/US 101** Install an enhanced pedestrian crossing.	State	City/State Funds	$200,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 3	North
CR6	**SE 32nd Street/US 101** Install an enhanced pedestrian crossing.	State	City/State Funds	Funded	Medium	1,2,3,6	Financially Constrained	Tier 1	South
CR7	**SW Naterlin Drive/US 101** Improve pedestrian connections between Yaquina Bay Bridge and downtown Newport through pedestrian wayfinding, marked crossings, and other traffic control measures.	State	City/State Funds	$25,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
CR8	**NW 68th Street/US 101** Install an enhanced pedestrian crossing.	State	City/State Funds	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North
CR9	**North of NW 60th Street/US 101** Install an enhanced pedestrian crossing to serve existing transit stops and RV park north of NW 60th Street.	State	City/State Funds	$200,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 4	North
CR10	**NW 58th/US 101** Install an enhanced pedestrian and bike crossing to connect to the shared-use path on the east side of US 101.	State	NURA	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North
CR11	**NW 48th/US 101** Install an enhanced pedestrian and bike crossing.	State	City/State Funds	$200,000	Medium	1,2,3,6	Unconstrained	Unconstrained Tier 4	North
CR16	**NW 8th/US 101** Install an enhanced pedestrian crossing.	State	NURA	$200,000	Medium	1,2,3,6	Financially Constrained	Tier 1	North, Downtown
CR18	**SW Bay/US 101** Install an enhanced pedestrian crossing.	State	NURA	$200,000	High	1,2,3,4, 6	Financially Constrained	Tier 1	Downtown
PRO1	**Parking Management** Implement additional parking management strategies for the Nye Beach and Bayfront Areas. Strategies could include metering, permits, or other time restrictions.	Newport	City Funds	$600,000	Medium	2,5,8	Financially Constrained	Tier 1	n/a

PROJECT ID*	PROJECT DESCRIPTION	PRIMARY FUNDING AGENCY	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PROJECT EVALUATION RANKING	TSP GOALS MET	PACKAGE**	PRIORITY HORIZON	MAP AREA
PRO2	**Transportation Demand Management** Implement strategies to enhance transit use in Newport. Specific strategies could include public information, stop enhancements, route refinement, or expanded service hours.	Newport	City Funds	$475,000	Medium	2,4,5,8	Financially Constrained	Tier 2	n/a
PRO3	**Neighborhood Traffic Management** Implement a neighborhood traffic calming program.	Newport	City Funds	$475,000	Medium	2,3,6,8	Financially Constrained	Tier 1	n/a
PRO4	**Yaquina Bay Ferry Service** Implement a foot ferry for bicyclists and pedestrians across Yaquina Bay.	State	City/State Funds	$4,750,000	High	2,3,4,6, 7	Unconstrained	Unconstrained Tier 3	n/a
PRO5	**ODOT Coordination** Coordinate with ODOT to develop signage, pavement marking, or other solutions where appropriate to limit side street blockage by stopped vehicles, at intersections where there is no alternative route, such as San-Bay-O Circle, NW 73rd Court and NW Wade Way/Cherokee Lane.	State	City/State Funds	$100,000	Low	1,2,4,8	Unconstrained	Unconstrained Tier 4	n/a

Notes:* "INT" represents an intersection improvement project; "EXT" represents a roadway extension project; "REV" represents an existing roadway improvement or reconfiguration project; "SW" represents a sidewalk improvement project; "TR" represents a trail or shared use path improvement project; "BR" represents a bike route improvement project; "SBL" represents an improvement project to add separated or buffered bike lanes; "BL" represents an improvement project to add standard bike lanes; "CR" represents a roadway crossing improvement project; "PRO" represents a citywide demand or system management project.

** Financially Constrained = projects likely to be funded; Unconstrained = projects not likely to be funded.

FIGURE 42: ASPIRATIONAL MULTIMODAL PROJECTS (NORTH MAP AREA)

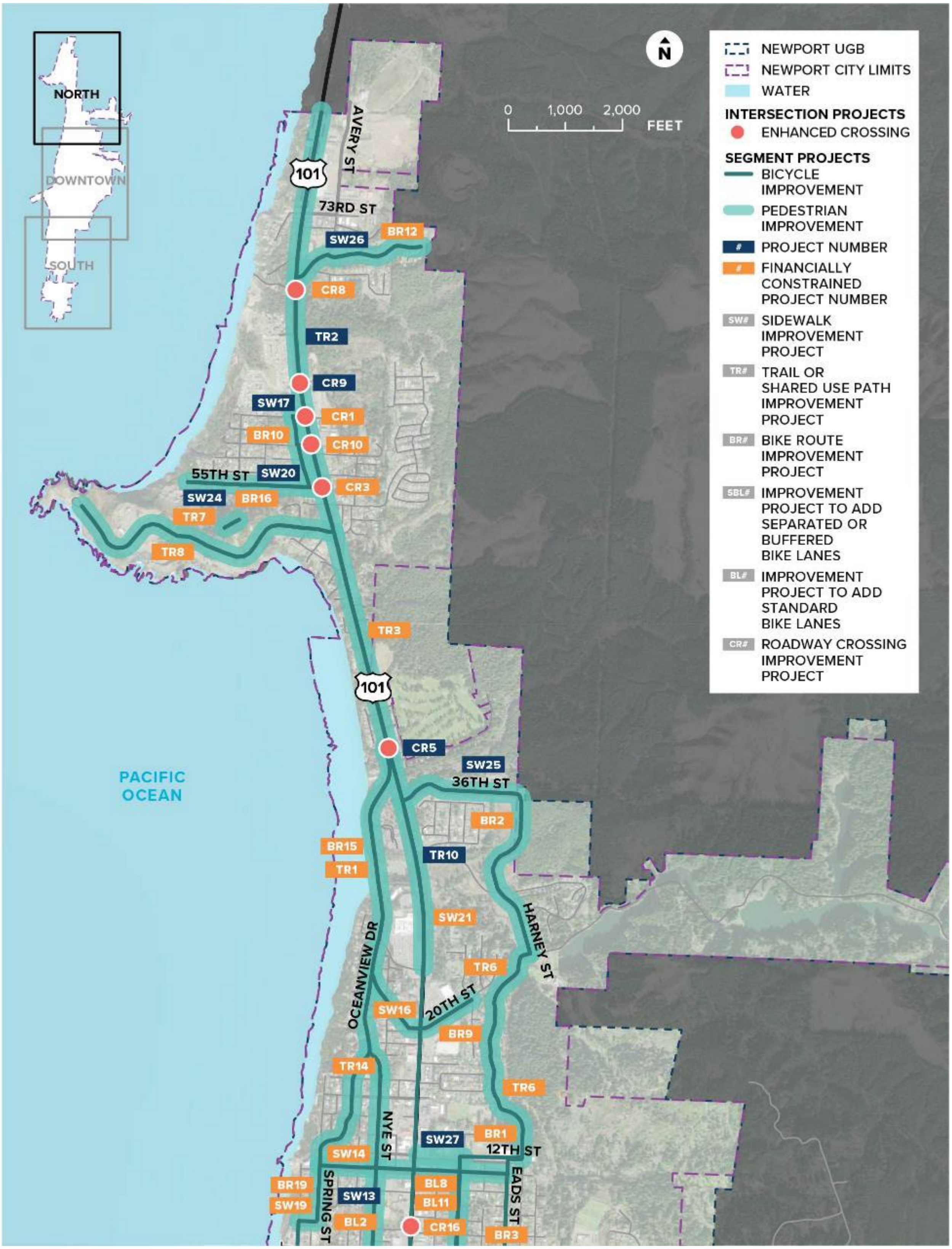


FIGURE 43: ASPIRATIONAL MOTOR VEHICLE PROJECTS (NORTH MAP AREA)

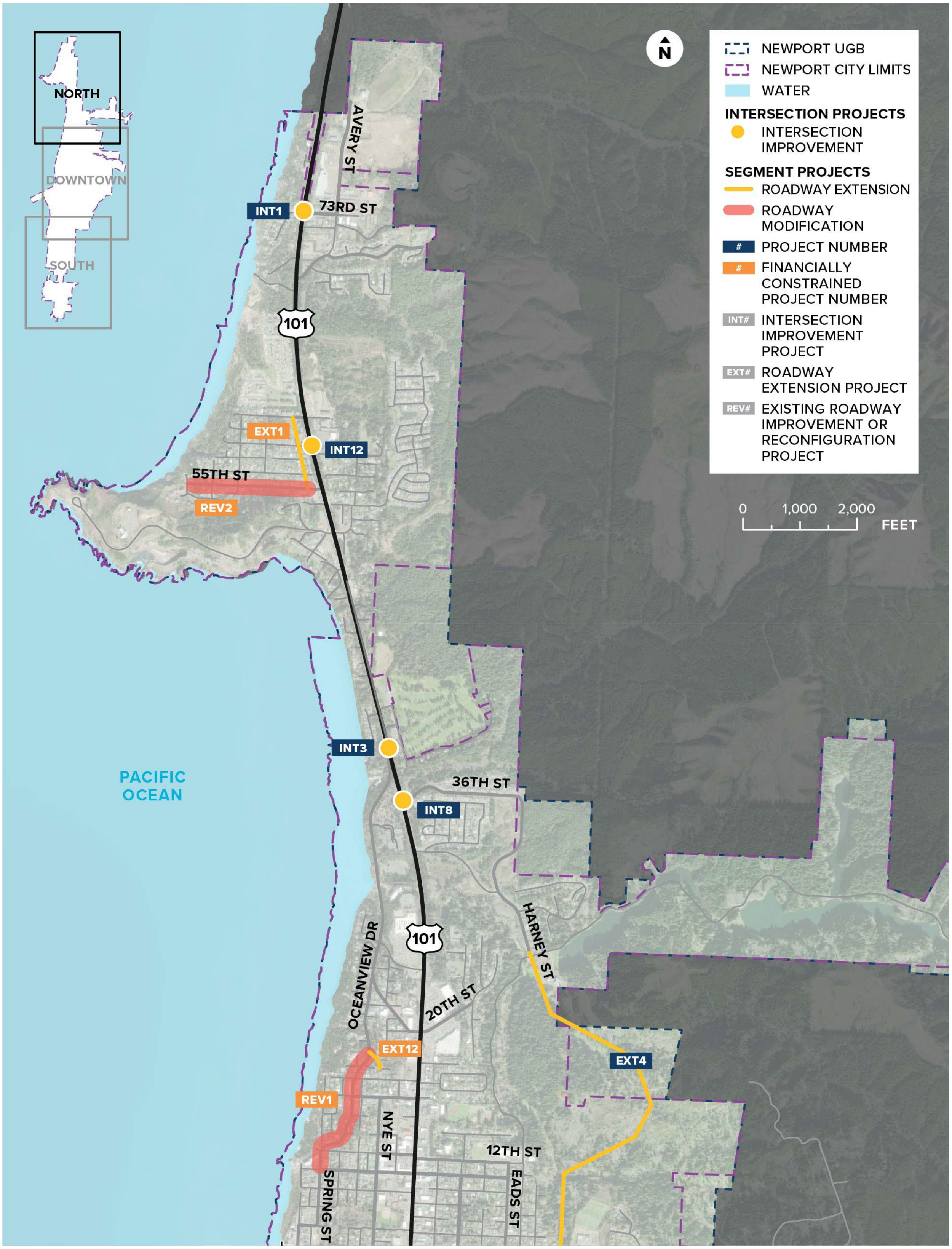


FIGURE 44: ASPIRATIONAL MULTIMODAL PROJECTS (DOWNTOWN MAP AREA)

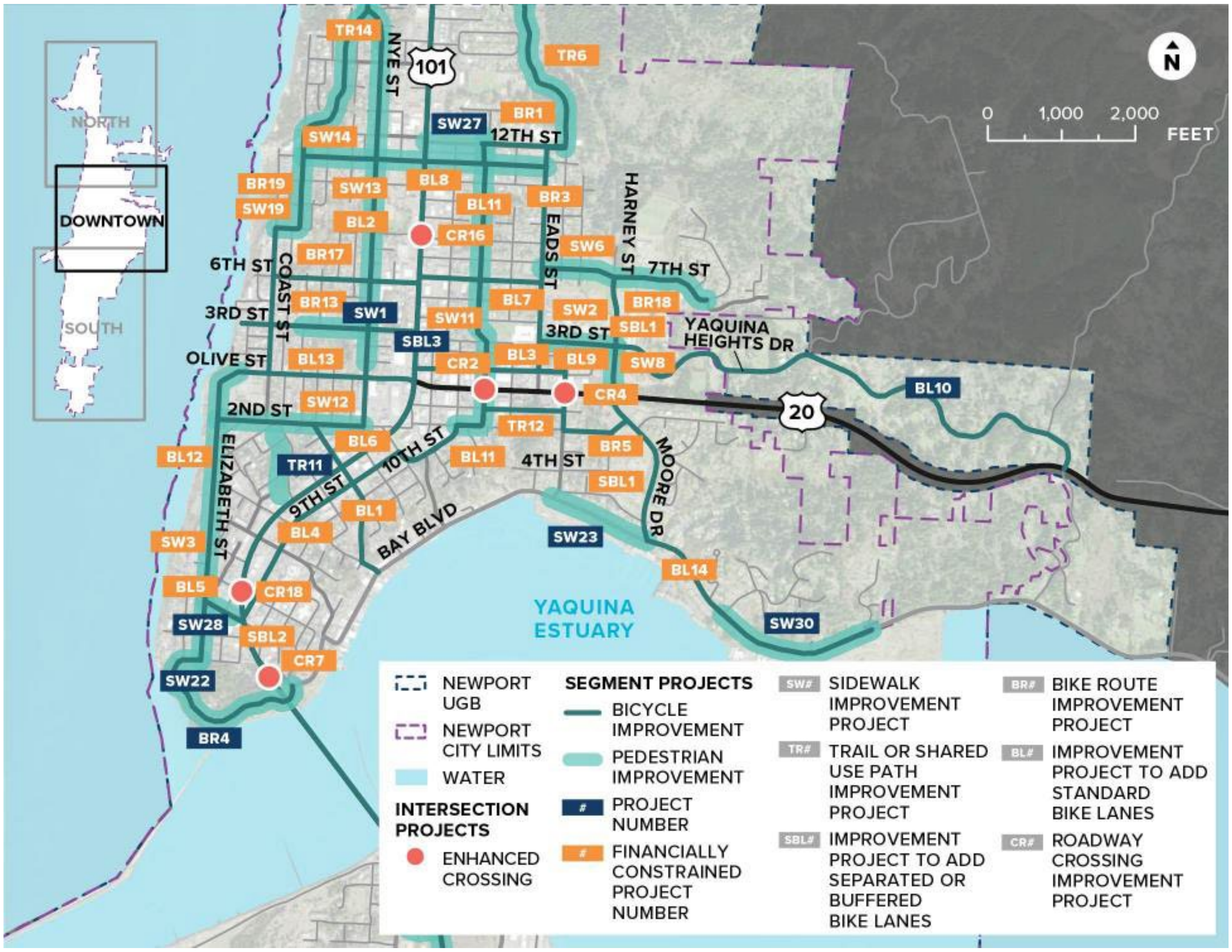


FIGURE 45: ASPIRATIONAL MOTOR VEHICLE PROJECTS (DOWNTOWN MAP AREA)

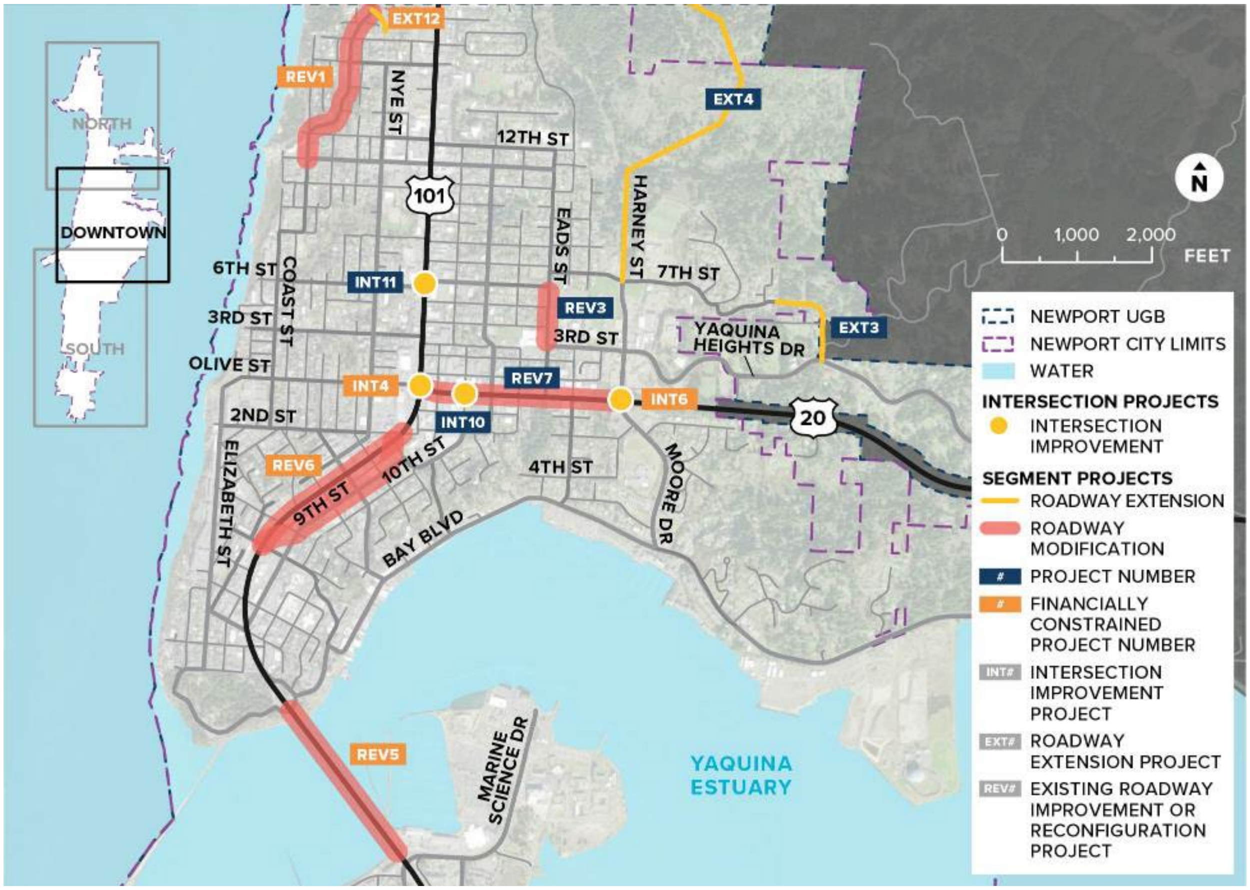


FIGURE 46: ASPIRATIONAL MULTIMODAL PROJECTS (SOUTH MAP AREA)

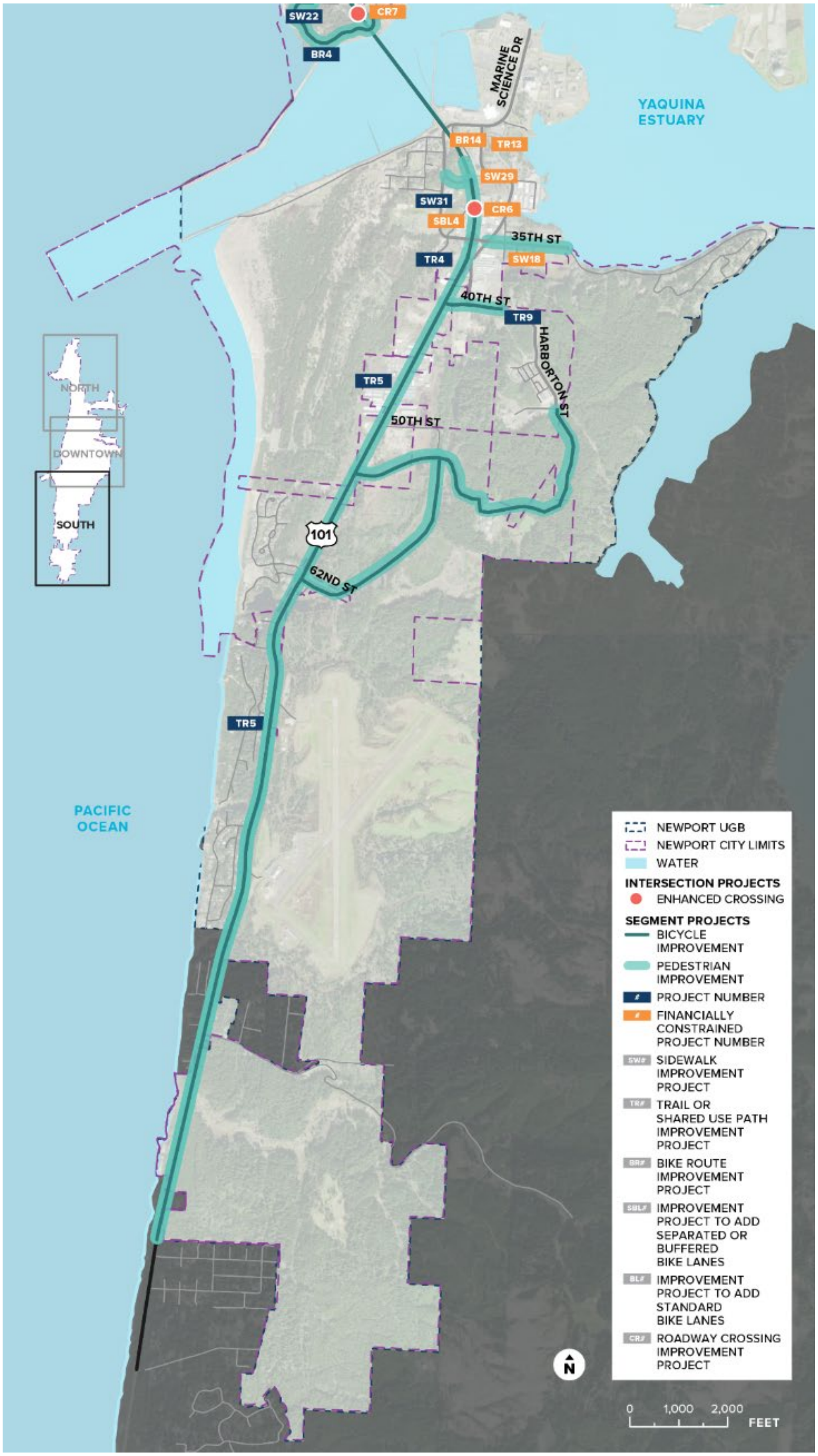
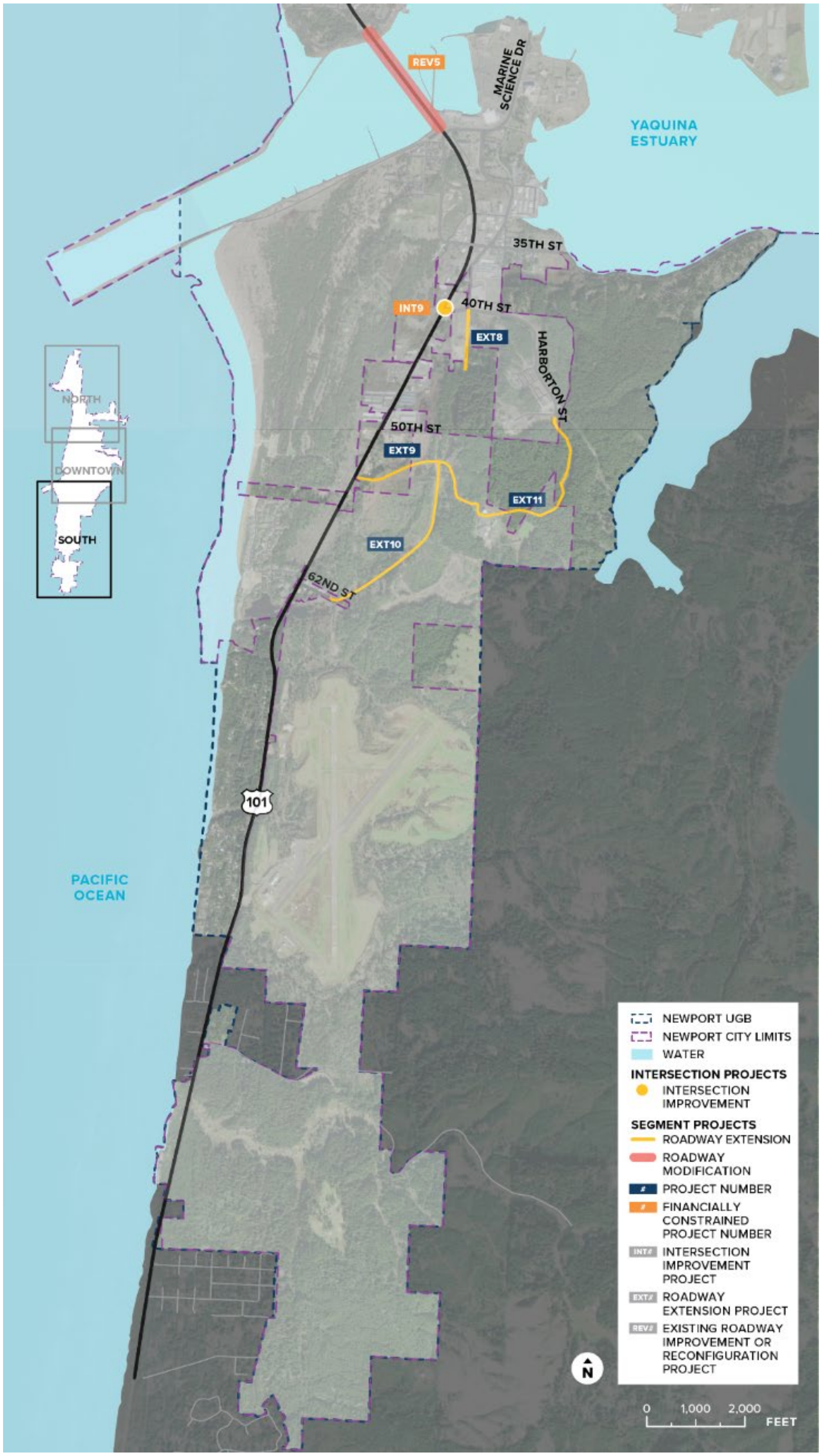


FIGURE 47: ASPIRATIONAL MOTOR VEHICLE PROJECTS (SOUTH MAP AREA)



Chapter 7: Implementation and On-Going Strategies

The foregoing chapters presented the goals, policies, plans and programs to support the city's Transportation System Plan and its vision of growth to 2040. The City of Newport TSP update incorporates several elements that require further action to facilitate full implementation of the plan. These implementation actions are described in the following sections.

Furthermore, it is recognized that there are a host of on-going community issues related to general transportation needs that will not be resolved by this TSP process and outcomes. These issues are acknowledged in the final section along with a summary of their status, applicable on-going strategies, and the expected path forward.

STEPS TO SUPPORT PLAN IMPLEMENTATION

SUPPLEMENTAL FUNDING OPTIONS

Providing adequate funding for capital investments and on-going maintenance of transportation systems and services is a major challenge. One of the unique funding features available to the City of Newport is its Urban Renewal Districts that were established in 2015 for the Northside and for the South Beach areas. These two districts augment traditional transportation revenue sources, which will enable the city to advance priority capital investments to support economic growth and other community objectives within the district boundaries.

As reported earlier during this TSP update process[7], the City's current funding programs are expected to generate about $76 million for transportation system improvements through 2040 (with an additional $3 million from the South Beach Urban Renewal District). This was identified as the amount that could fund higher priority projects, which were referred to as Financially Constrained projects. Compared to other Oregon coastal cities, this is a significant capital funding resource. However, when compared to the full list of improvement projects identified through this TSP update, which totals $227 million, additional funding options are needed to fund any lower priority projects, especially those projects that are located outside of Urban Renewal Districts.

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[7] Finance Program Technical Memorandum dated February 18, 2021, (see Appendix)

If the City desires to add more funding opportunities, the best candidates are a transportation utility fee, a local fuel tax increase, and a short-term property tax levy. Table 11 shows some illustrative examples of possible revenues along with actions required for implementation. The transportation utility fee is enacted by council resolution and could generate $450,000 annually ($8.5 million through 2040) for each $1 charged per residential unit monthly. Other cities with such fee programs charge between $4 and $10 per month for a residential unit. Applying the high end in Newport, it would provide about $85 million through 2040.

The other notable option for Newport is the potential increased local fuel tax, however voters in the City have recently turned down an increase. Given their latest rate proposals, the local fuel tax would add about $200,000 annually, or just under $4 million through 2040. The final option listed is a limited property tax levy, which would produce the least additional revenue.

TABLE 11: SELECTED SUPPLEMENTAL FUNDING OPTIONS

FUNDING OPTION	ACTION REQUIRED TO IMPLEMENT	EXAMPLE CHARGE	ILLUSTRATION OF ADDITIONAL ANNUAL REVENUE
TRANSPORTATION UTILITY FEE	City Council adoption	$1 per month for residential units and $.01 per month per square foot for non-residential uses	$450,000
LOCAL FUEL TAX INCREASE	Voter Approval	+Four cents per gallon during the winter and +two cents per gallon during summer	$253,000
PROPERTY TAX LEVY	Voter Approval	$0.20 per $1,000 in assessed value (per year, for 5 years)	$300,000 (per year, for 5 years)

If the City wants to supplement the transportation funding beyond what is currently available to advance lesser priority project improvements, it is recommended to further consider one of the above supplemental options.

ACTION: Pursue and enact supplemental local transportation funding option.

NEIGHBORHOOD TRAFFIC MANAGEMENT TOOLS

The Transportation System Plan identifies a new classification of city streets that are the best candidates for applying neighborhood traffic management (NTM) strategies. The primary purpose of this new classification is to address community concerns about autos speeding through neighborhoods or diverting away from state highways while they are under severe congestion. These streets are referred to as neighborhood collector routes, and they are shown in Figure 22,

Figure 23, and Figure 24, and listed in the supporting technical memorandum[8]. Potential management strategies include traffic humps, traffic circles and raised crosswalks, which are illustrated in the memorandum.

The challenge with a NTM program is to identify a clear and objective process for collecting community inputs, assessing the prevailing concerns, and evaluating which, if any, NTM solution is appropriate to be installed. This will require developing guidelines about which NTM strategies are best for Newport, and where and how they are to be applied. In addition, many cities balance the technical review process with a consensus opinion of the affected neighbors to help ensure community satisfaction with the NTM decision.

ACTION: It is recommended that city develop and implement a NTM program that formalizes these processes.

STREET CROSSINGS

Streets with high traffic volumes and/or speeds in areas with trail crossings, or nearby transit stops, residential uses, schools, parks, shopping and employment destinations generally require enhanced street crossings with treatments to improve the safety and convenience for pedestrians. The TSP includes several recommended crossing enhancements. However, going forward, it is recommended that the city update their development code to match the TSP Transportation Facility and Access Spacing Standards[9].

ACTION: Update Municipal Code to incorporate street and access spacing standards identified in the TSP for city streets

Enhanced street crossings along US 101 or US 20 should be provided between every 250 to 1,500 feet, depending on the urban context, as summarized in Table 310.1-A of the ODOT Traffic Manual. Exceptions include where the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use or other factors that may prevent safe crossing. All crossings on state facilities require review and approval by ODOT.

Enhanced pedestrian crossing treatments should be considered on high speed or high volume roads (*e.g.* US 101, US 20) at transit stops, trail crossings, and at major pedestrian street highway crossings that connect major destinations (*e.g.* parks, grocery stores, schools) to residential areas. The recommended enhanced pedestrian crossing treatment should be determined through coordination with ODOT along state highways and using the National Cooperative Highway Research Program (NCHRP) Report 562, Improving Pedestrian Safety at Unsignalized Intersections. It is recommended that these guidelines be reviewed with all traffic studies for any potential street crossing associated with new development in the city

ACTION: Amend the city's traffic impact analysis guidelines to include review of pedestrian crossing treatments consistent with NCHRP Report 562.

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[8] Technical Memorandum #10 Transportation Standards, June 30, 2021

[9] Ibid., Table 8: Transportation Facility and Access Spacing Standards

VEHICLE MOBILITY STANDARDS

Mobility standards for streets and intersections in Newport provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur. Two common methods currently used in Oregon to gauge traffic operations for motor vehicles are volume to capacity (v/c) ratios and level of service (LOS). For State facilities, mobility targets are v/c ratio based and listed in the Oregon Highway Plan (OHP). The TSP process identified alternative mobility targets on state facilities, which will be addressed by ODOT to amend the OHP.

The City of Newport does not have adopted mobility standards for motor vehicles. It is recommended that the city consider adopting mobility standards to include both a v/c ratio and LOS standard. Having both a LOS (delay-based) and v/c (congestion-based) standard can be helpful in situations where one metric may not be enough, such as an all-way stop where one approach is over capacity, but the overall intersection delay meets standards. The City of Newport should also introduce mobility standards that depend on the intersection control which can better capture acceptable levels of performance across different intersection control types.

ACTION: Amend city development code to introduce vehicle mobility standards on city streets consistent with the TSP, as summarized below.

TABLE 12: RECOMMENDED VEHICLE MOBILITY STANDARDS FOR LOCAL STREETS

INTERSECTION TYPE	PROPOSED MOBILITY STANDARD	REPORTING MEASURE
SIGNALIZED	LOS D and v/c ≤0.90	Intersection
ALL-WAY STOP OR ROUNDABOUTS	LOS D and v/c ≤0.90	Worst Approach
TWO-WAY STOP [1]	LOS E and v/c ≤0.95	Worst Major Approach/Worst Minor Approach

Notes:

Applies to approaches that serve more than 20 vehicles; there is no standard for approaches serving lower volumes.

ADDITIONAL ACTIONS

Additional implementation actions include:

- Amend the Public Facilities Chapter of the Newport Comprehensive Plan to align its transportation goals and objectives with those contained in the TSP.
- Take into consideration the larger parcel impact of right-of-way acquisitions for transportation projects and provide fair market compensation for such impacts.
- Support and promote emerging transportation technologies, where feasible, including the rollout of infrastructure for electric vehicles.
- Require that transportation solutions selected for commercial core areas along US 101 and US 20 promote economic revitalization of these areas in addition to addressing broader transportation needs of the community.
- Identify the need for project specific geotechnical analysis in the Agate Beach area in line with the recommendations contained Appendix M.

ON-GOING ISSUES AND AREAS OF EMPHASIS

YAQUINA BAY BRIDGE

The Yaquina Bay Bridge is an essential component of regional mobility for Newport and the central Oregon coastal area. Existing narrow travel lanes, lack of shoulders, and a steep grade contribute to a reduced capacity compared to similar highways. Traffic volumes along the bridge are forecasted to be around 20,000 during an average weekday which is near capacity for several hours each day. As traffic volumes grow, this congestion could impact segments of US 101 approaching the Yaquina Bay Bridge or lead to additional congestion in off-peak hours.

During the Transportation System Plan process the central questions posed by the community about this historic structure were around the expected timing of a replacement, and whether the highway alignment and bridge crossing might be shifted to another location. The City Council sent a letter to ODOT with these questions. In a letter dated February 4, 2021, ODOT Director Kris Strickler replied that ODOT would continue to maintain and preserve the bridge in the best condition possible for the foreseeable future. The latest bridge replacement cost was estimated to be over $200 million and noted that ODOT allocated about $300 million for statewide bridge work over the 2024-2027 improvement cycle. It was further noted that this is one of 11 unique, historic, or significant in size bridges in ODOT's Seismic Resilience Plan that require major investments that is beyond the reach of current funding. As such, the State will be looking at new opportunities to secure the necessary funding for future improvements to the crossing of Yaquina Bay. The timing for a replacement is uncertain, and not expected to occur within the next 20 years.

In the meantime, ODOT will continue to strengthen the existing bridge to better endure seismic events and generally prolong the usable life of this bridge. ODOT did recommend that the city add policy to its Transportation System Plan that supports keeping the current general highway alignment for any future bay bridge. For example, a new bridge could be placed immediately adjacent to the existing bridge so that the highway is operational throughout construction. This policy statement will be important at a later date to guide further studies, which could include an ODOT led Facility Plan that conducts more in-depth preliminary design and environmental studies to select a footprint for bridge replacement.

FERRY

Yaquina Bay Bridge congestion and the lack of certainty of a replacement has prompted alternative ideas on how to serve trips between the South Beach area and the northside of Newport. One idea stemming from the South Beach Redevelopment Plan was to provide a short-range ferry service across the bay to serve pedestrians and bicyclists during the summer months. Further studies are needed to identify likely landing points on either side of the bay for this new ferry service, and to evaluate the expected capital and maintenance costs to operate it, and the funding source to initialize it.

VOLUME 2: APPENDIX

CONTENTS

APPENDIX A- TECHNICAL MEMORANDUM #1: PUBLIC AND STAKEHOLDER INVOLVEMENT STRATEGY

Technical Memorandum #1

Public and Stakeholder Involvement Strategy

Prepared for

City of Newport

Prepared by

JLA Public Involvement, Inc.
921 SW Washington Street, Suite 570
Portland, OR 97205

May 2019

The following is a draft of the **Public and Stakeholder Involvement Strategy (PSIS)** for the City of Newport's

Transportation System Plan (TSP) update scheduled to be implemented throughout the duration of the planning process for public input and outreach activities to begin in early fall 2019.

This outline includes the proposed sections to be included in the draft and final Public and Stakeholder Involvement Strategy (PSIS) – Technical Memorandum (TM) #1, resources and activities to be used during the Public Involvement phase of the project.

Public and Stakeholder Involvement Strategy (PSIS)

Introduction

This Public and Stakeholder Involvement Strategy (PSIS) will guide stakeholder and public involvement throughout the duration of the City of Newport's Transportation System Plan (TSP) update process at key milestones and through targeted subarea workshops.

The PSIS reflects commitments from the City of Newport (including recommended transportation investments from the recently completed Greater Newport Vison 2040 Plan) and Oregon Department of Transportation (ODOT) to coordinate and carry out public outreach activities designed to provide interested parties an opportunity to have input on these plans.

The Greater Newport Area Vision 2040 was developed with the guidance and collaboration of The Greater Newport Area Vision 2040 Advisory Committee, the Newport City Council, and City of Newport staff, based on thousands of comments and suggestions received from Greater Newport Area community members and visitors.

The public involvement work will expand upon the work and leverage the connections created during the Greater Newport Vision 2040 planning process.

Project Description and Project Area

The City of Newport's **Transportation System Plan (TSP)** is a long-range plan that establishes goals, policies and transportation related investment priorities in compliance with Statewide Planning Goal 12 and Transportation Planning Rule. Further, the plan will implement strategies contained in the Greater Newport Vision 2040 and Northside Urban Renewal Plan, which identifies the revitalization of US Highway 101 and US Highway 20 corridors, investing in maintenance and upgrades to transportation infrastructure as high priorities. It considers all modes of travel and provides guidance on how to invest in the transportation system through a combination of projects, policies, and programs to meet travel needs as a coastal city, and as the City continues to grow. The City of Newport's current TSP was adopted in 1997, partially updated in 2008 and 2012, and needs to be revisited to reflect the latest community vision and current infrastructure systems in Newport and the surrounding subareas in the Commercial Core area (including corridors around US Highway 20 and US Highway 101 north of the Yaquina Bay Bridge and Agate Beach Neighborhood).

The Newport TSP project will update the current Newport TSP, focusing on the Commercial Core area (which includes corridors around Highway 20 and Highway 101) north of the Yaquina Bay Bridge and Agate Beach Neighborhood.

The Newport Transportation System Plan (TSP) update will inform how identified investments and funding can best be leveraged to create a transportation system that meets the long-term needs of the community and surrounding subareas.

Components of the Newport TSP update will:

- Evaluate the performance of the Newport, Commercial Core Area Transit System, including the effectiveness of the existing bus routes and services and the financial performance of the system;
- Identify transit service needs of residents, businesses, visitors, or OSU/OCC that are not being met, or are not being met well, by the existing transit system;
- Design and evaluate short- and long-term (2040) transit system improvement alternatives that address any unmet needs or future growth opportunities.
- Recommend a plan for operations and capital improvements to implement the community preferred alternatives.

More specifically, the Newport TSP update is intended to address:

- Alignment for future replacement of the Yaquina Bay Bridge.
- Desired streetscape, urban form, and arterial/collector roadway configuration for the City's commercial core areas that will catalyze redevelopment and meet the community's long-term transportation needs.
- Transportation enhancements for the Agate Beach neighborhood that are sensitive to the geologic conditions of the area.
- Capital project needs, in a realistic manner, with planning level estimates for both near term and longer term priorities.
- Viability of NE Harney Street as a north-south alternative to US 101.
- Integrated multi-use bike and pedestrian network that improves connectivity between neighborhoods, visitor destinations, and natural areas.
- Traffic calming measures and bicyclist and pedestrian safety needs, with an emphasis on high volume roadway and Safe Route to School corridors.
- Transit needs of the community, including a coordinated strategy to augment and maintain the system.
- Acceptable street cross-sections with a palette of options that are responsive to different forms of development, environmental limitations and terrain constraints.

- Infill frontage improvement requirements that strike a reasonable balance between the cost to the developer and needs of the community.

[more info here to include City and County descriptions and background info, populations, major roadways and key businesses, colleges, Ports, etc. for the City of Newport and subareas in the Commercial Core area -including corridors around US Highway 20 and US Highway 101 north of the Yaquina Bay Bridge and Agate Beach Neighborhood]

Public Involvement Purpose and Goals

The purpose of the public involvement program is to share information and gather input on the needs and issues of stakeholders, local residents, businesses and key communities in Newport and the surrounding areas.

We are committed to sharing information and gathering input regarding the needs and issues of the public, stakeholders, and all potentially affected community members related to this planning effort.

The public involvement goals are to:

- Identify and engage all potentially affected and/or interested individuals, communities, and organizations that live, work, and play in Newport and surrounding subareas.
- Actively seek public input throughout the 24-month process of the project, engaging a broad, diverse audience and clearly communicating start and end points of the process.
- Provide meaningful public involvement opportunities and demonstrate how input has influenced the process.
- Seek full and fair participation of all potentially affected community members, and/or interested individuals, neighborhoods, businesses and organizations; including disabled, low-income, limited English proficiency, minority or other underserved groups.
- Keep the public and interested stakeholders engaged throughout the planning process; keep the interest high even after key milestones.
- Educate public on the importance of improved transportation systems and transportation infrastructure to allow for informed decision making.
- Foster and sustain a collaborative and mutually respectful process while developing the Newport TSP.
- Communicate complete, accurate, understandable, and timely information to the public and partners throughout the development of the Newport Transportation System Plan (TSP) update.
- Demonstrate how input has influenced the process and is incorporated into the final Newport Transportation System Plan (TSP) update.

- Comply with Civil Rights Act of 1964 Title VI requirements. Title VI and its implementing regulations provide that no person shall be subjected to discrimination on the basis of race, color or national origin under any program or activity that receives federal financial assistance.
- Ensure that the public involvement process is consistent with applicable state and federal laws and requirements, and is sensitive to local policies, goals and objectives.

Audiences

As stated in the public involvement goals, the public engagement efforts seek full and fair participation of all potentially affected community members, and/or interested individuals, neighborhoods, businesses and organizations; including disabled, low-income, limited English proficiency, minority or other underserved groups.

The public involvement process will seek to engage the following types of affected and interested people and organizations in the project area:

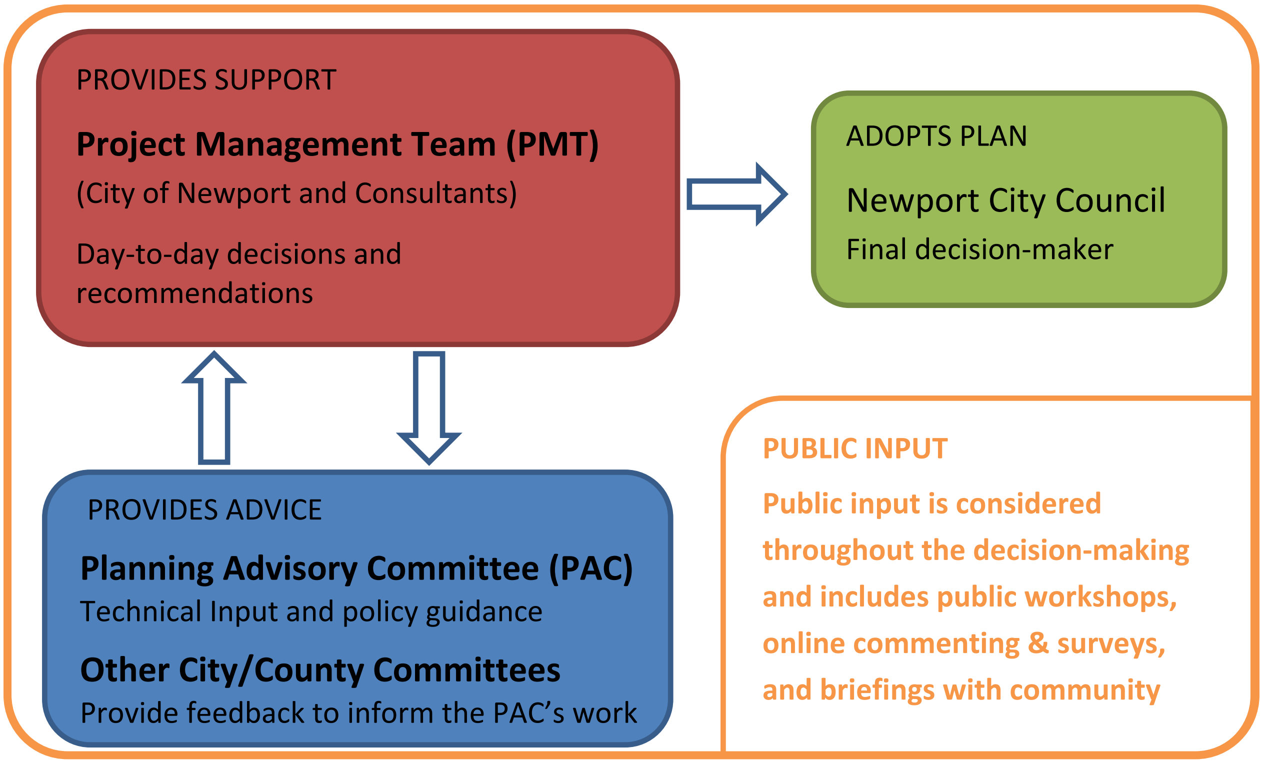
- Identified groups created from Newport Vision 2040 Planning
- Elected officials
- Agency partners working on related plans
- Business organizations, associations and chambers of commerce
- Bike, Pedestrian, and Transit advisory boards
- Bike and pedestrian interests
- Transit interests, including current or potential passenger transit riders/users, including Dial-A-Bus
- Tourist attractions, including tour bus and other tourist transportation companies
- Freight interests
- Environmental interests
- Accessibility groups
- Senior services
- Minority & low-income groups
- Health equity interests
- Tourism interest groups
- School districts (including student and parent groups)
- Oregon State University/Oregon Coast Community College
- Housing and community development interests
- Lincoln County
- Emergency services providers
- Neighborhood Associations (formal or informal)
- Local event organizers
- Downtown and historic Newport interests
- Large employers
- Recreational interests & Recreational users
- General public
- Local media
- Utility providers (electric, water, gas, cable)

Key Messages

- As the City and surrounding areas continue to grow, this project provides an important opportunity to engage the public to determine transportation needs for the City of Newport communities and subareas, now and for the next 20+ years.
- The Newport TSP will implement strategies contained in the Greater Newport Vision 2040 and Northside Urban Renewal Plan, which identifies the revitalization of US Highway 101 and US Highway 20 corridors, investing in maintenance and upgrades to transportation infrastructure as high priorities.
- The Newport TSP project will provide a road map for how the City should be investing in its transportation system to catalyze redevelopment of its commercial core areas, improve the level of service to underdeveloped areas, and develop a more "complete street" system.
- Portions of the current TSP are over 20-years old and no longer accurately reflect the condition or needs of the community.
- The updated Newport TSP will need to support concurrent planning documents of the City of Newport and the State of Oregon and Lincoln County's Transit Development Plan (TDP).
- The City is committed to engaging the public, local communities, and visitors on this project and is employing tools to be accessible to a broad, diverse audience.
- The City will ensure full and fair participation by all potentially affected community members in the decision-making process, with outreach to engage disabled, low-income, limited English proficiency, minority or other underserved groups.
- The TSP will prioritize what projects compete for funding and will inform how investments can best be leveraged.
- There are many important factors that can impact local transportation needs. During the TSP update process, the team will consider transportation corridors of Highway 101 and Highway 20, pedestrian and bicyclist activity, connectivity, increased traffic volumes on both highways, funding opportunities, street design standards, and development conditions, among others.
- The TSP is a 24-month long planning process that, when complete, will help to improve overall transit performance and meet the City's evolving transportation needs.
- The Newport TSP will address current needs and future improvements to the Yaquina Bay Bridge.

Decision-making Structure

Local residents, key stakeholders, government agencies, and elected officials all have a role to play in developing Newport's TSP. The City of Newport, ODOT and other Project Partners will form a Planning Advisory Committee (PAC) to gather input.



Illustrative graphic to show decision-making framework (to be redesigned for this project); sample shown here: Sample: Illustrative Graphic (above)

The City Council is the project's final decision maker. The Project Management Team (PMT) will make recommendations to the City Council based on technical analysis and stakeholder input. The decision-making structure for the TSP update will be developed to establish broad-based support for the project.

To support development of a credible decision-making process, a Planning Advisory Committee (PAC) will be developed, with City Council appointing the PAC, provide community-based recommendations and feedback to inform the TSP. The PAC will develop recommendations to the PMT and the City Council. Additionally, focus groups will be pulled together to inform targeted outreach and workshops in the US-20/US-101 corridors and Agate Beach Neighborhood.   All meetings will be open to the public and include a public comment period.

More information on these groups can be found in the next section of the PSIS.

Project Team Member Roles & Responsibilities for Public Involvement

The following are the key PMT members and their roles in the public involvement program:

City of Newport

- **Derrick Tokos (Planning Director), Project Manager.** Derrick provides project oversight to ensure that the project meets the requirements and objectives of affected community members and organizations within the project area and surrounding areas.

Oregon Department of Transportation (Region 2)

- **James Feldmann (Region 2; Area 4) – Senior Region Planner.** Provides oversight for funding being administered by ODOT (representing the state's interest). James is also part of the PMT.

Public Involvement Consultant Team

- **Dee Hidalgo (JLA), Public Involvement Project Manager.** Dee provides general oversight for the public involvement program – including public involvement, outreach and communications. Dee will communicate, meet and participate in conference call meetings with City of Newport and the PMT as needed to discuss public involvement issues.

- **Ayano Healy (JLA), Public Involvement Coordinator.** Ayano supports Dee in oversight of the public involvement program.

Planning Consultant Team

- **Carl Springer (DKS), Project Manager.** Carl is leading the consultant team, providing oversight on the TSP and strategy and development and leading presentations with public groups.

- **Andrew Parish (Angelo Planning Group), Senior Planner.** Andrew is coordinating with the team for the development of the TSP and will assist Carl with presentations with public groups and community workshops.

- **Darci Rudzinski (Angelo Planning Group).** Darci supports Andrew in the coordination and development of the TSP.

Role of the Planning Advisory Committee (PAC)

The Planning Advisory Committee (PAC) will be formed to provide a community perspective to the process of developing the Newport TSP update. The committee will be appointed by the City Council. The PAC will develop recommendations to the Project Management Team (PMT) and the City Council. All meetings will be open to the public and include a public comment period.

Planning Advisory Committee (PAC) Members

- TBD [with input from City, ODOT and support from DKS]

[JLA will coordinate with the City and ODOT to develop a PAC roster and invite people to participate in the PAC. DKS will provide support. The City to provide contact info for prospective PAC members. JLA will develop a draft PAC charge and protocols for discussion at PAC meeting #1.]

The PAC may include community members, advocates, and representatives of affected agencies.

JLA will also develop a plan for engaging at least 4 other City/County Committees to ensure these groups have an opportunity to fully participate in the process and provide feedback to inform the PAC's work (e.g. City Bike/Pedestrian Committee, City Planning Commission, 60+ Advisory Committee, and County Planning Commission).

JLA, with input from the City will recommend a committee organization to address the Commercial Core and Agate Beach Neighborhood as well as the general citywide transportation needs and solutions.

Public Involvement Strategies

The project groups discussed earlier in the PSIS will serve as the primary tools for collaboration and consensus building on the project. The following table includes stakeholder engagement and informational tools and activities that will be used throughout the project to engage and inform a broader public audience.

Stakeholder Engagement

Tool/Activity	Description	PI Lead	Timeframe
Interviews with Community Groups & Key stakeholder	To inform the Public and Stakeholder Involvement Strategy, JLA will conduct interviews with up to 5 community groups and 20 key stakeholders, to incorporate into the PSIS. JLA will develop interview questions.	JLA, with input from City and PMT	Late summer/early fall 2019 (prior to workshops in fall 2019) TARGET: Sept. 2019
Interested Parties List	An interested parties list will be developed and maintained for the TSP update. List will include potentially impacted parties in the project area and subareas, interested parties, and past meeting attendees (created through other projects & planning process meetings). The interested parties list will be updated after public events and will track those individuals and groups who express interest in the project. The list will be used for notification of public events, project news and outreach materials.	JLA (initial list provided by the City)	Initial list, summer 2019 and ongoing throughout project
Comment Response (Comment collection, analysis and responses)	An online sign-up feature through the project website for interested parties list will allow user to self-select interest areas, such as specific travel modes or geographic areas, as well as general citywide issues. JLA will log, track and respond to public inquires, and analyze all public comments and coordinate responses to comments using the web-based system.	JLA	At same time website is live; to be tracked throughout the project

Tool/Activity	Description	PI Lead	Timeframe
Targeted Outreach to EJ/Title VI Communities	JLA will develop a fact sheet about the TSP update process that will also be translated into Spanish and conduct three (3) focused events to share information with Title VI/EJ communities. Beyond fact sheet, the three (3) events will use materials developed for other events and meetings.	JLA	Fall 2019, during same time as workshops (TBD)
Social media	Existing City's Facebook page and Twitter account will include project announcements, news, and meeting information, as well as solicit feedback. JLA will draft content to direct people to website, announcements for public meetings and workshops (Note: Social Media platforms will not be used to collect feedback, but to drive people the public website). Feedback will come through the website.	City (will use existing social media platforms); JLA to draft social media content	Prior to first public meetings (starting in fall 2019)

Tool/Activity	Description	PI Lead	Timeframe
Comments and surveys	In addition to information sharing, the website will provide an opportunity for two-way communication. The site will contain an online comment form where the public can share thoughts and ideas, as well as host online surveys at key milestones. Paper surveys will be distributed to high traffic locations and to organizations and businesses serving residents that may not be comfortable taking a survey online. *Additionally, surveys will be included in City's existing utility billings/mailings*. Both paper and online surveys will be translated into Spanish. Special efforts will be made to target elementary school parents and high school students, disabled, low-income, limited English proficiency, minority and underrepresented or other underserved populations such as Spanish-speakers, to participate in public surveys.	JLA & City	Starting in late summer/early fall 2019
Community Workshop Series #1 (3-day event) and Community Event #2	During each of the community workshop series (3) total and Community Event #2 topic-specific work group meetings will be held to solicit input on the goals and policies of the TSP, as well as suggestions for transportation system options to be considered to address deficiencies. Work group meetings will include displays, interactive maps and other tools. Special efforts will also be made to recruit participants from underrepresented populations. Information for the events can be made available in alternative languages and formats upon request. Accommodations will be provided to persons with disabilities.	JLA & DKS	TBD

Tool/Activity	Description	PI Lead	Timeframe
Community and jurisdictional briefings	The City will meet with interest groups such as neighborhood and business groups, service providers, multicultural interests, schools and student groups and others, to discuss the project and collect input. These briefings are an opportunity to meet with people who might not attend open houses and keep those who are following the project informed on progress.	City, JLA will provide written materials	TBD
Individual communications	The City will hold briefings with stakeholders and elected officials as needed to share information, collect input, and build consensus.	City, JLA will provide written materials	TBD
Translation, interpretation and outreach	The City will work with community organizations to identify and implement targeted outreach to the Spanish-speaking community. Key project documents will be translated into Spanish. Interpretive services will be made available upon request.	City, JLA will provide written materials	TBD
Community Workshop Series #1 (3-day event)	The project will host three separate community workshops over three (3) back-to-back days in Newport and other subareas to provide one-on-one opportunities to talk about the project and get feedback from the general public.	JLA & City	(TBD date, late summer/early fall 2019)
Community Workshop Series #1.1-Commercial Core (Day 1 of 3)	Location: Commercial Core, Meeting Location TBD	TBD, date	(fall 2019)
Community Workshop Series #1.2- Agate Beach (Day 2 of 3)	Location: Agate Beach NA, Meeting Location TBD	TBD, date	(fall 2019)
Community Event #1.3 – City-Wide Design Workshop (Day 3 of 3)	Location: Newport (City Wide), Meeting Location TBD	TBD, date	(fall 2019)

Tool/Activity	Description	PI Lead	Timeframe
PAC Roster	JLA will coordinate with City and ODOT to develop roster and invite people to participate in the PAC. PAC MEETING LOCATION: CITY HALL OR OTHER LOCATIONS AS NECESSARY JLA will draft PAC charge and protocols for discussion at PAC meeting #1.	JLA, with City and ODOT coordination	June 2019
PAC Meeting #1	Location, more details TBD	DKS	During same dates/times as workshops
PAC Meeting #2	Location, more details TBD	DKS	During same dates/times as workshops
PAC Meeting #3	Location, more details TBD	DKS	During same dates/times as workshops
Community event #3	Plan, develop, implement and facilitate discussions at Community Event. City will schedule community event #2, provide notification to media, provide meeting room and distribute public information on City website, and through press release. JLA will provide media release info to the City.	JLA, with City, DKS, Sera Architects.	
Postcard	JLA will prepare and mail postcard to interested parties list and addresses within City limits.	JLA	2-3 weeks prior to first community workshop (late summer)
Project Displays	To be developed for the use of public materials and for community workshops	DKS	2 weeks prior to community workshops
Written Materials (for City public outreach effort)	JLA will prepare materials for City to use in meetings with the community. City will meet with community members to discuss Draft TSP and provide feedback to the PMT. Materials may include: one-page summaries of project status, copies of project graphics, or brief PowerPoint presentation).	JLA	July, when website launches, in advance of fall community workshops

Tool/Activity	Description	PI Lead	Timeframe
Public Surveys	JLA share online surveys over the website at key milestones to solicit input from the general public	(tbd) JLA, on public website (with review from City)	Starting in July, when website launches

Information Tools

Tool/Activity	Description	PI Lead	Timeframe
Web site	The project website, [tbd custom URL], is the primary source for public information. The site includes comment options and surveys, project description, copies of project materials and contact information for project staff. Upcoming meetings are announced on the site and materials are posted here in advance of each meeting. Google translate allows web content to be translated into different languages.	JLA	July 2019
Project video	Project video will be created to raise awareness and interest. Video will be posted on the project website and [social media sites] in an effort to engage diverse stakeholders and will include English and Spanish subtitles.	JLA	July 2019
Fact sheet (English & Spanish)	A fact sheet will be prepared to support open houses, committee meetings, community briefings, and can be attached to news releases. The fact sheet will be updated as needed to reflect project milestones and will be translated into Spanish.	JLA	Starting in July, when website launches
Email announcements	Email announcements will be distributed via City's email blast to interested parties included in the Interested Parties List to provide project updates and notification of meetings.	City, with JLA support as needed	Prior to first community workshops, or TBD
News releases	The PI team will identify opportunities to keep the project in the news by producing media releases. Releases will be sent prior to open houses and committee meetings and at key milestones.	City,	Prior to first community workshops, or TBD

Measuring and Monitoring Outreach Activities

The PMT will evaluate the public involvement process on an ongoing basis to determine the effectiveness of the outreach effort. The PSIS will be modified as needed to expand successful techniques.

At key milestones, the PI team will meet to discuss and assess how well the program is meeting the public involvement goals listed in this plan. While evaluation of these goals is necessarily subjective, the team will also consider the following more measurable objectives as the team assesses program effectiveness:

- Number of participants attending meetings or events.
- Number of responses received to a survey or questionnaire.
- Number of website hits or downloads occurring during a specific time period.
- Number of followers, responses and retweets on Twitter.
- Number of followers and messages on Facebook.
- Number of people who have signed up for the project mailing list.
- Number of project comments received (phone, email, comment cards, online).
- Whether the comments are relevant to the project (indicates project understanding).
- How project decisions have been modified as a result of public input.

Demographic Analysis

As part of the outreach to engage communities, impacted populations and stakeholders in the Newport TSP project area, the City will make special efforts to involve disabled, low-income, limited English proficiency, minority or other underserved groups.

The demographic data will be summarized and is intended to set a citywide baseline that will be compared to more localized areas of the City in future technical memoranda. This will ultimately help identify areas of the City that have higher concentrations of these populations.

Project Area

[draft, snapshot image of map to show City of Newport and surrounding areas/subareas]

The City of Newport's **Transportation System Plan (TSP)** is a long-range plan that implements the transportation element of the City's recently completed Greater Newport Vision 2040 plan, which identifies the revitalization of US Highway 101 and US Highway 20 corridors, investing in maintenance and upgrades to transportation infrastructure as high priorities. It considers all modes of travel and provides guidance on how to invest in the transportation system through a combination of projects, policies, and programs to meet travel needs as a coastal city, and as the City continues to grow.

The project study area includes Newport and the surrounding subareas in the Commercial Core area (including corridors around US Highway 20 and US Highway 101 north of the Yaquina Bay Bridge and Agate Beach Neighborhood). Updating the Newport TSP will require updating the plan with information gathered about the study area. A multi-faceted approach will be used to investigate the City of Newport and surrounding areas/subareas; some of these strategies will include: conducting a demographic analysis using Census and American Community Survey (ACS) data, stakeholder interviews, community surveys, open houses, etc.

This demographic analysis will provide one aspect of the necessary information gathering that will inform the public and stakeholder involvement strategy and subsequent TSP strategies.

Purpose and Approach

The purpose of this exploratory analysis is to:

1. Use **U.S. Census data** to create a demographic profile that, at minimum, aligns with the standards described in the *ODOT Guidelines for Addressing Title VI and Environmental Justice in Transportation Planning* (ODOT Guidelines).

2. Conduct a (temporal) **analysis of the demographic trends** and apply analysis to inform project-specific public involvement and outreach strategies.

In addition, completing a demographic analysis is a directive informed by the 1994 Executive Order (E.O.) 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Its purpose is to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The ODOT Guidelines have been drafted to assist in the following:

> *Title VI and Environmental Justice (EJ) populations are a special focus in transportation planning and project development, and specific reporting requirements exist related to these federally recognized populations. Title VI and EJ regulations are intended to make participation in transportation planning and project development more inclusive of diverse communities in planning and project areas, as well as to make the analysis conducted for transportation planning and project development more inclusive of the needs of the groups and individuals that live in these communities. The Title VI federal regulations and EJ Executive Order are supported by Statewide Planning Goals in Oregon, particularly Goal 1 (Citizen Involvement).*

Operating in accordance with state guidelines will assist in ensuring fidelity to universally practiced approaches; however it will aspire to supplement this benchmark with other data sources that may be more localized or relevant to better understanding the underserved needs (for project input and public outreach) and to anticipate subsequent distribution of proposed project impacts.

Methodology

Socioeconomic and demographic indicators have been compared using 2013-2017 and 2008-2012, 5-Year American Community Survey (ACS) Estimates. Data was analyzed using statistical analysis software, R, to query the decennial US Census and American Community Survey APIs and the US Census Bureau's geographic boundary files. Figure 1 lists the data table used in the analysis.

Figure 1. Table listing 2008-2012 and 2013-2017 ACS 5-Year Estimates data tables used.

Table Name	Reference
DP02 - SELECTED SOCIAL CHARACTERISTICS IN THE UNITED STATES	DP02
DP03 - SELECTED ECONOMIC CHARACTERISTICS	DP03
DP04 - SELECTED HOUSING CHARACTERISTICS	DP04
DP05 - ACS DEMOGRAPHIC AND HOUSING ESTIMATES	DP05

Due to limitations with how ACS estimates are generated, the City of Newport is the smallest geography that can be evaluated in this analysis. Throughout the report, the City of Newport has been compared to nearby Lincoln City, surrounding Lincoln County, and to the state to provide overall context for demographic changes and trends that have occurred in the study area. Whenever possible, the analysis attempted to include margins of error and statistical significance as context for estimate reliability, particularly when estimates will be directly involved in public involvement outreach strategy development and decision-making.

The following topics are included in the demographic analysis:

- Race and Ethnicity
- Age
- Sex
- Disability
- Limited English Proficiency
- Low-income & Housing Cost Burden

Overview

Over the last 10 years, the population in Oregon has been growing. While all study areas experienced a population growth, the City of Newport population growth was closer in line with Lincoln County and the state, overall (Figure 2).

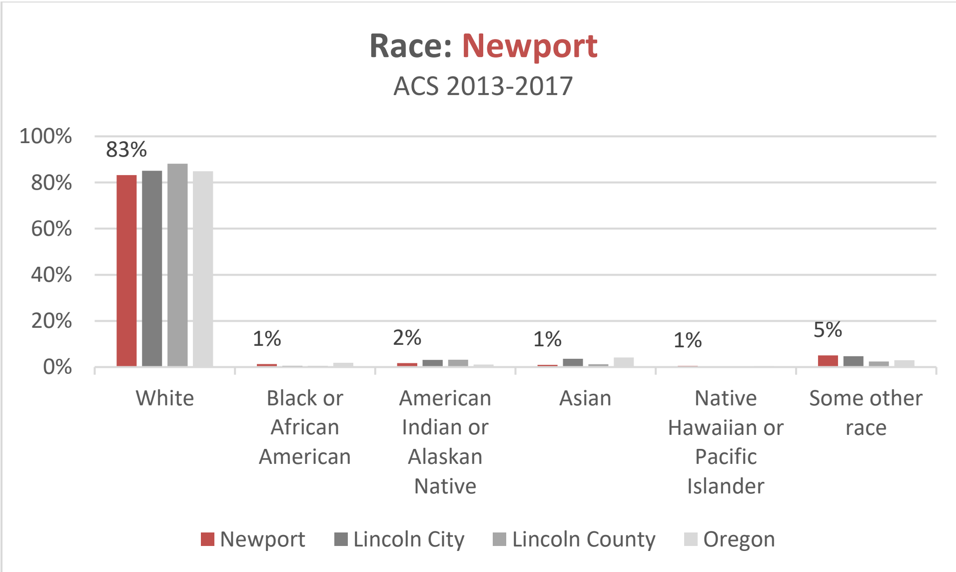
Figure 2. Total Population (DP05)

	Newport	Lincoln City	Lincoln County	Oregon
2017	**10 274**	8 541	47 307	4 025 127
2012	**9 989**	7 926	45 992	3 836 628
Percent growth	**3**	7	3	5

Race & Ethnicity

Generally, the City of Newport largely has a similar racial composition to nearby Lincoln City, the county, the state (Figure 3). However, among the study geographies, the City of Newport had the greatest drop in the share of those who identify as White, dropping from roughly 88 percent in 2012 to 83 percent in 2017.

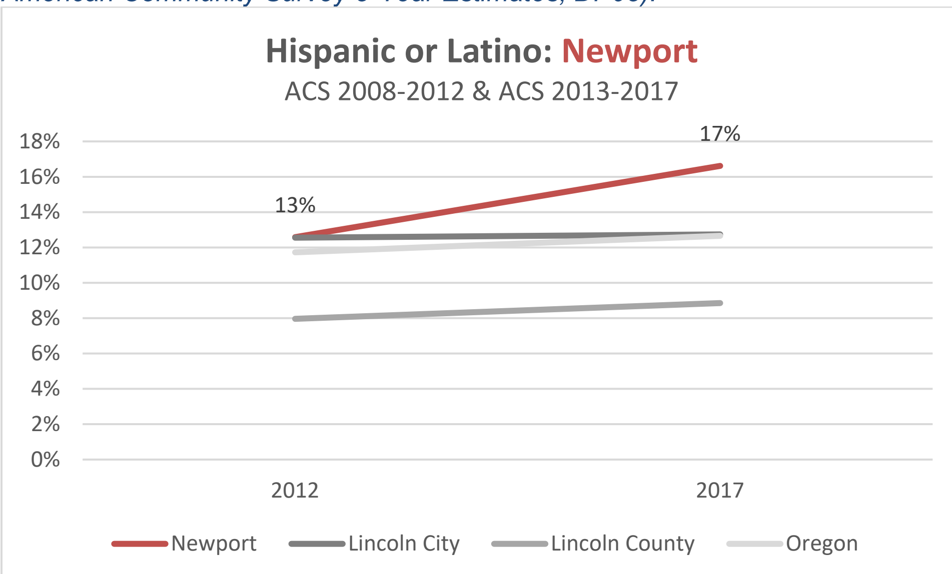
Figure 3. Bar graph comparing shares of major non-Hispanic, race alone groups for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, DP05).



Race: Newport
ACS 2013-2017
100%
80%
60%
40%
20%
0%
83%
1%
2%
1%
1%
5%
White
Black or African American
American Indian or Alaskan Native
Asian
Native Hawaiian or Pacific Islander
Some other race
Newport
Lincoln City
Lincoln County
Oregon

Since 2012, the share of Hispanic or Latino population has increased in the City of Newport, compared to Lincoln City, Lincoln, County, and the state overall (Figure 4). In addition, Newport has a relatively higher share of Hispanic or Latino residents compared to surrounding study areas.

Figure 4. Line graph comparing the changes in shares of the Hispanic or Latino population for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP05).



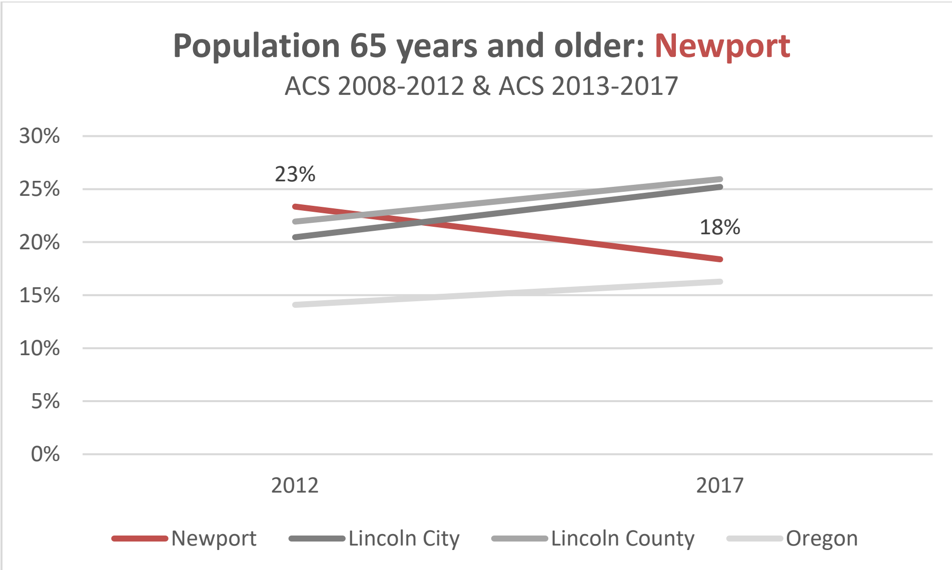
Age

The median age of the City of Newport is 44.9 years, which increased about one year since 2012, compared to Lincoln City (48.1 years) which increased roughly three years. Newport, Lincoln City, and Lincoln County all have higher median ages compared to the state overall (39.2 years).

Over the last ten years, the population of Newport that is 65 years and older has had a *statistically* significant change, decreasing from 23 percent to 18 percent of the population (Figure 5). In comparison, Lincoln City, the county, and state have all had an increase in the population 65 years and older. Although the share of Newport residents 65 years and older is higher than the state overall, it is lower in comparison to nearby Lincoln City and surrounding Lincoln County.

About 20 percent of the City of Newport is 18 years or younger, which is about the same as within the region and state.

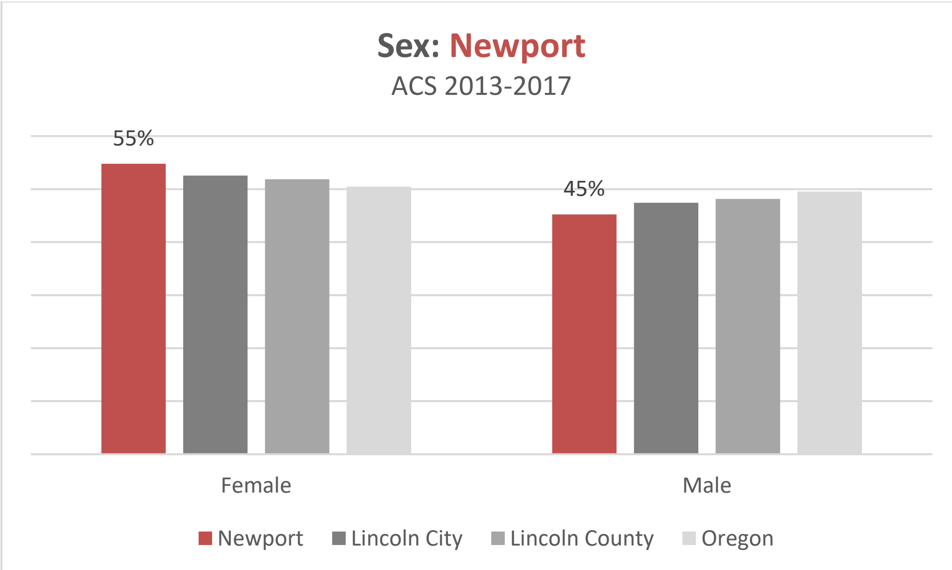
Figure 5. Line graph comparing the changes in shares of the population 65 years and older for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP05).



Sex

The share of males to females in the City of Newport is roughly the same as the surrounding area, with marginal change in the last ten years. Newport has higher share of females compared to males, with 55 percent female and 45 percent male in 2017 (Figure 6).

Figure 6. Bar graph comparing shares of male and female population for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, DP05).

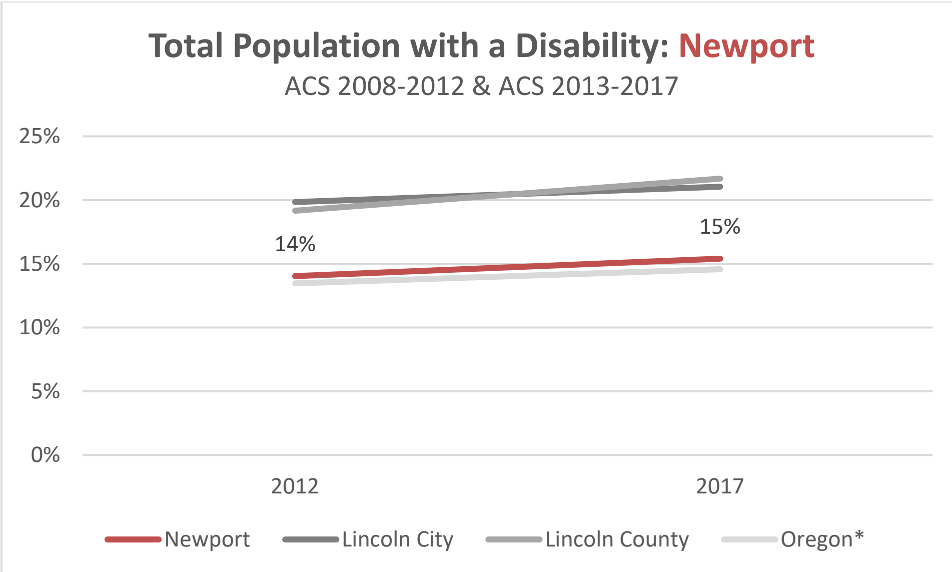


Disability

About 15 percent of the population in the City of Newport has a disability (Figure 7). This is lower when compared to Lincoln City and Lincoln County, however, it is roughly the same share compared to the state overall. Among 18-64-year-olds, the share of people with a disability has increased since 2012 (Figure 8) but remains below an estimated 800 people in Newport.

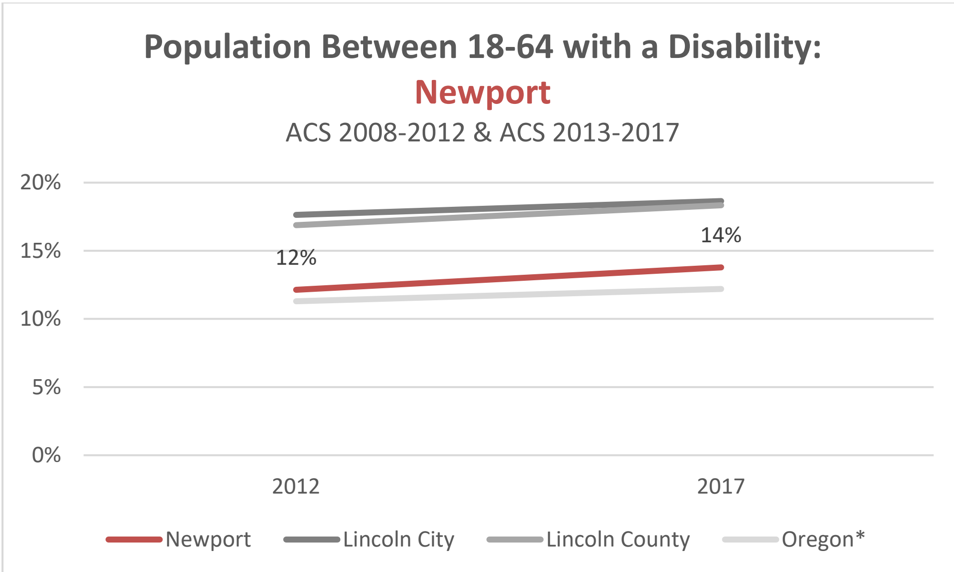
Almost one-third of the population 65 years and older have a disability (Figure 9). In Newport, the share has slightly decreased from 34 percent to 31 percent; Newport has the lowest share when compared to Lincoln City and Lincoln County and the state overall.

Figure 7. Line graph comparing the changes in shares of people with a disability for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP02).



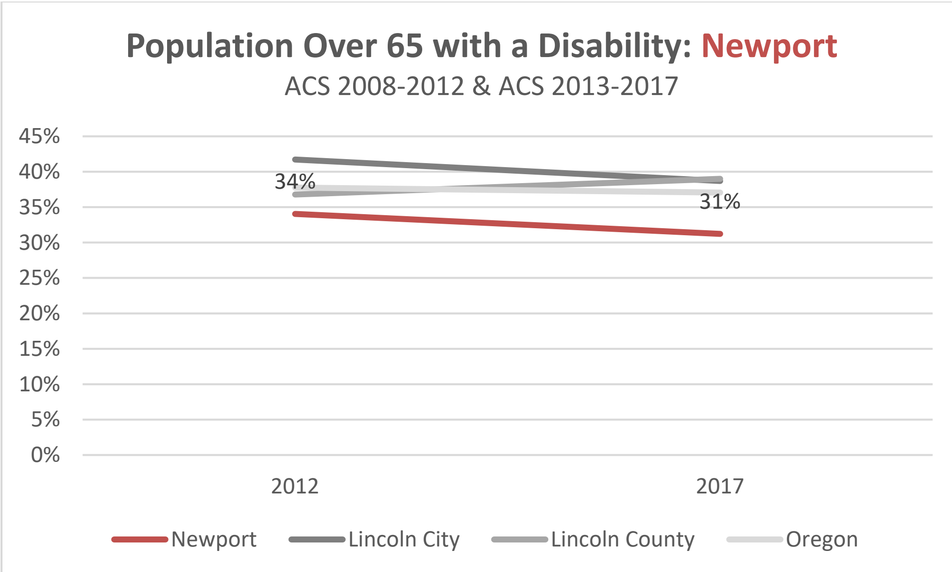
** Statistically significant change*

Figure 8. Line graph comparing the changes in shares of people between 18-64 years with a disability for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP02).



** Statistically significant change*

Figure 9. Line graph comparing the changes in shares of people over 65 years with a disability for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP02).

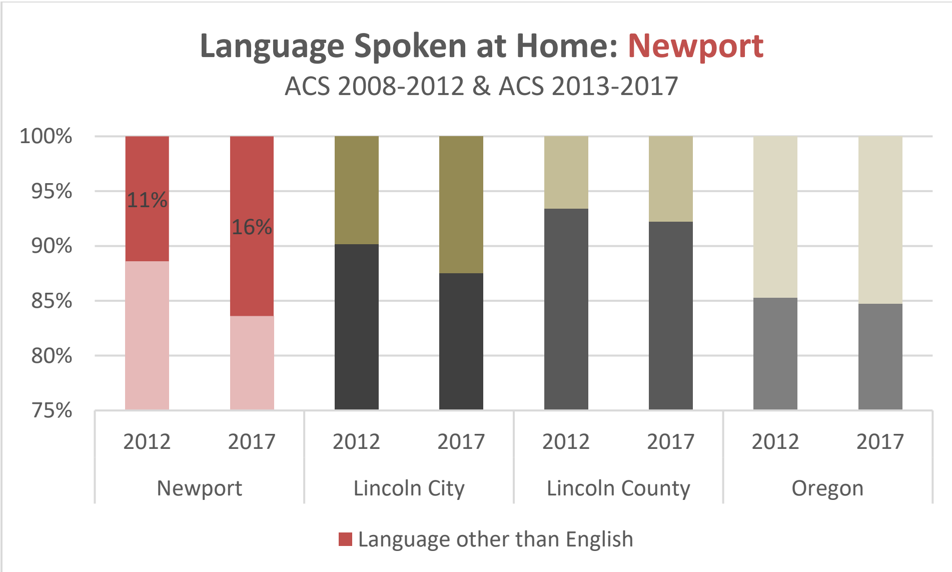


Limited English Proficiency

Over the last ten years, the share of the population (5 years and older) in Newport who speaks a language other than English at home has increased from 11 percent to 16 percent. This increase in share is greater compared to Lincoln City, the county, and state overall. In the City of Newport, roughly 15 percent of the population speaks Spanish. This is a higher share compared to nearby Lincoln City, which is about 10 percent Spanish-speakers, and Lincoln County which has about 6 percent Spanish-speakers.

Limited English proficiency has declined in the City of Newport since 2012 but remains higher when compared to Lincoln County overall. Among Spanish Speakers in the City of Newport, about 42 percent (or roughly 600 people) report speaking English “less than very well.”

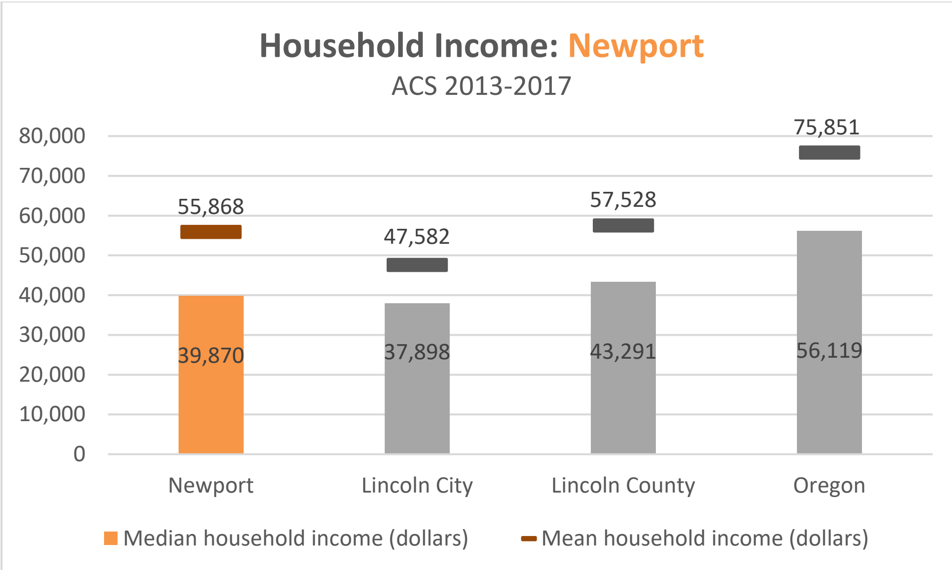
Figure 10. Bar graph comparing the changes in shares of “language spoken at home” for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP02).



Low-income & Housing Cost Burden

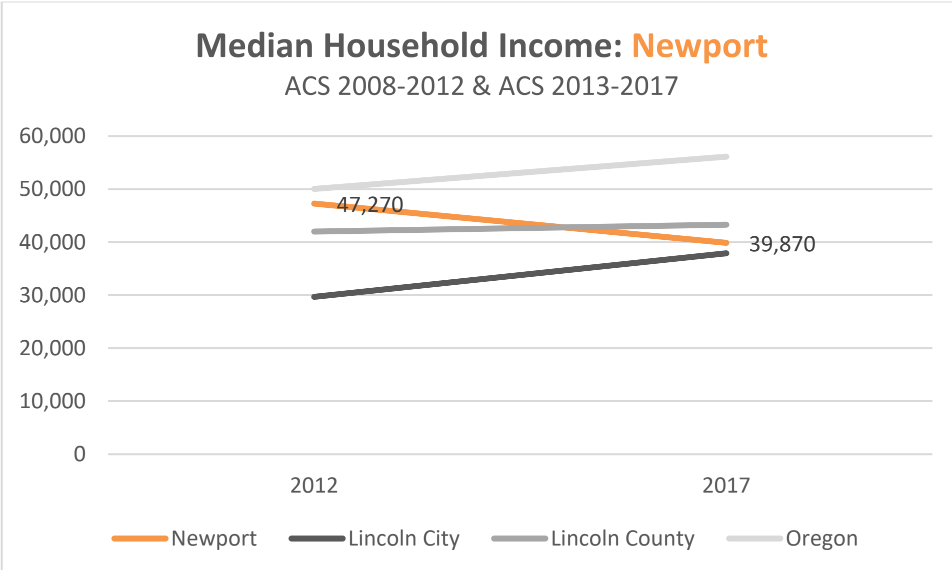
The median household income in Newport is roughly $40,000, which is within the range of Lincoln City and Lincoln County; median household income for both cities and Lincoln County are below the state overall (Figure 11). The estimate $16,000 difference between mean household income can be an indicator of the wealth gap among Newport residents. The high end of the household income range pulls the average/mean household income up; this income disparity is similarly observed in nearby and surrounding areas as well as the state overall.

Figure 11. Bar graph comparing the median and mean household income for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, DP03).



One notable difference for Newport is the direction that median household income has gone since 2012. Among the study geographies, the median household income for the City of Newport has been the only area to have decreased since 2012 (Figure 12); Newport's median household income has decreased by about $7,400 since 2012.

Figure 12. Line graph showing the changes in median household income for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2008-2012 & 2013-2017 American Community Survey 5-Year Estimates, DP03).



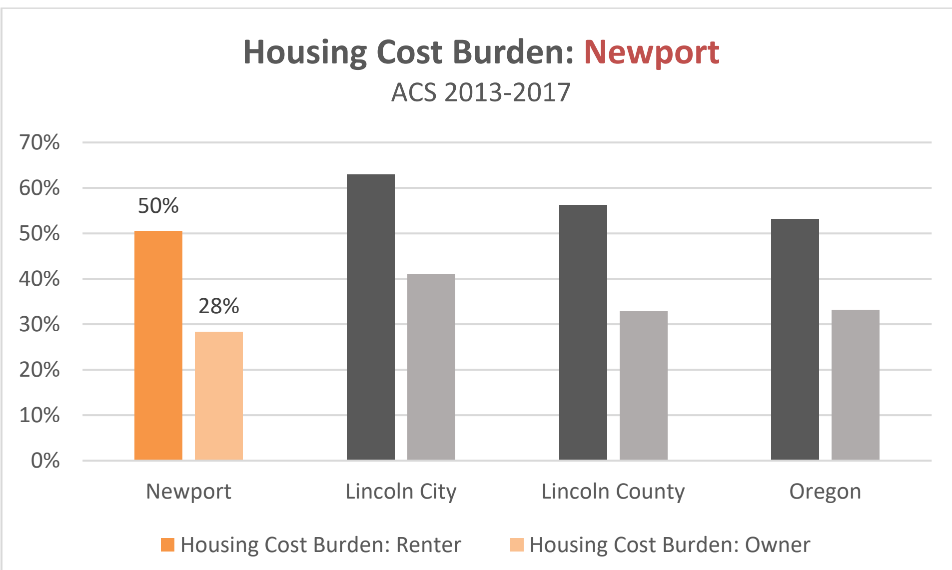
Roughly 20 percent of the population in the City of Newport is living with an income either at or below the federal poverty level (Figure 13). Just over 30 percent of the Newport population living in poverty are under 18 years old. Poverty rates for the City of Newport are generally lower compared to Lincoln City and similar to Lincoln County overall. Overall, poverty rates have slightly increased in Newport since 2012. Since 1 out 5 people in Newport are living in poverty, public involvement strategies should consider this a priority population for informing the TSP update.

Figure 13. Table comparing the shares of the population with income at or below the federal poverty for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, DP03).

	Newport		Lincoln City		Lincoln County		Oregon	
	2012	2017	2012	2017	2012	2017	2012	2017
People below poverty	18.7	19.4	20.5	23.4	16	18.4	15.5	14.9
Families below poverty	13.6	13.4	15.5	16.9	11	12.4	10.8	9.8
<18yrs below poverty	27.9	32.2	27.4	30.1	20.5	30.4	20.6	19
65yrs+ below poverty	10.1	8.5	11.4	14.8	8.5	8.3	8	8.2

Housing costs are a significant share of a household income and can assist in understanding the economic burden residents must manage. A *housing cost burden* is defined as having to pay more than 30 percent of income for housing; Figure 14 shows the share of renters and homeowners who are paying 30 percent or more of their household income on housing costs (i.e. rent, mortgage). In Newport, among occupied units paying rent, about half of renters are paying 30 percent or more of their income on rent/housing costs. Just under 30 percent of Newport homeowners (both those with and without a mortgage) are spending 30 percent or more on housing costs. Housing cost burden for renters and homeowners are lower in Newport compared to Lincoln City and Lincoln County, and are close to the same as the state overall.

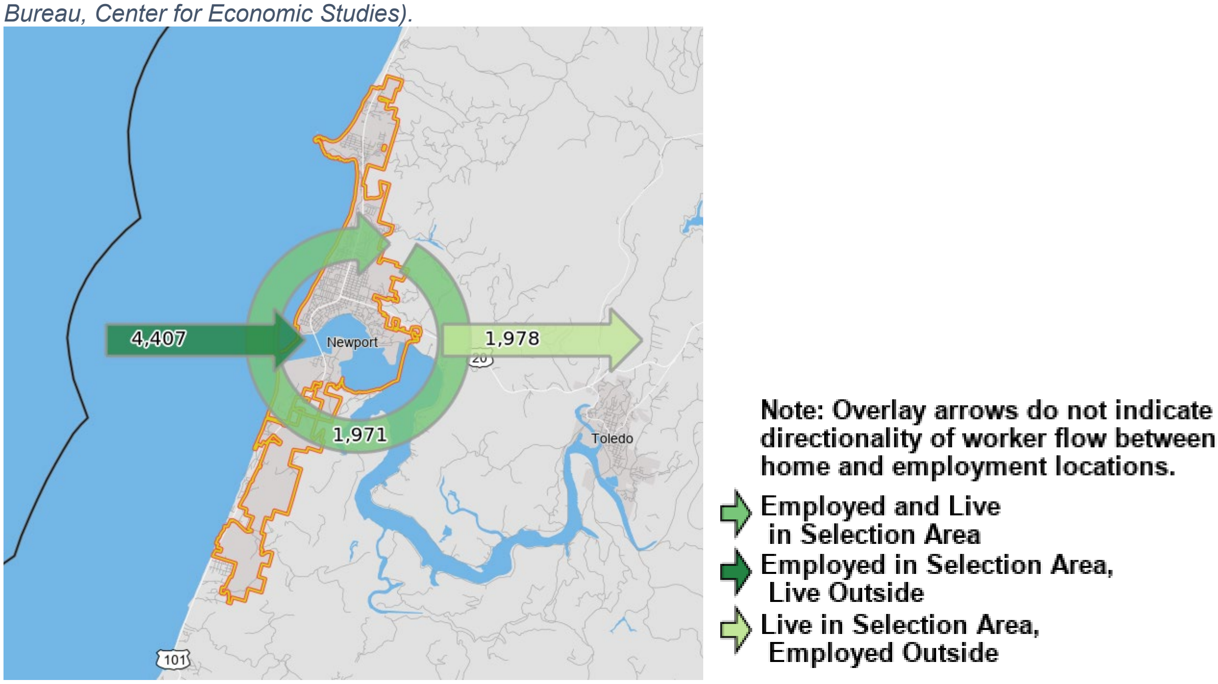
Figure 14. Bar graph comparing housing cost burden for renters and homeowners for Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, DP03).



Employment and Transportation Analysis

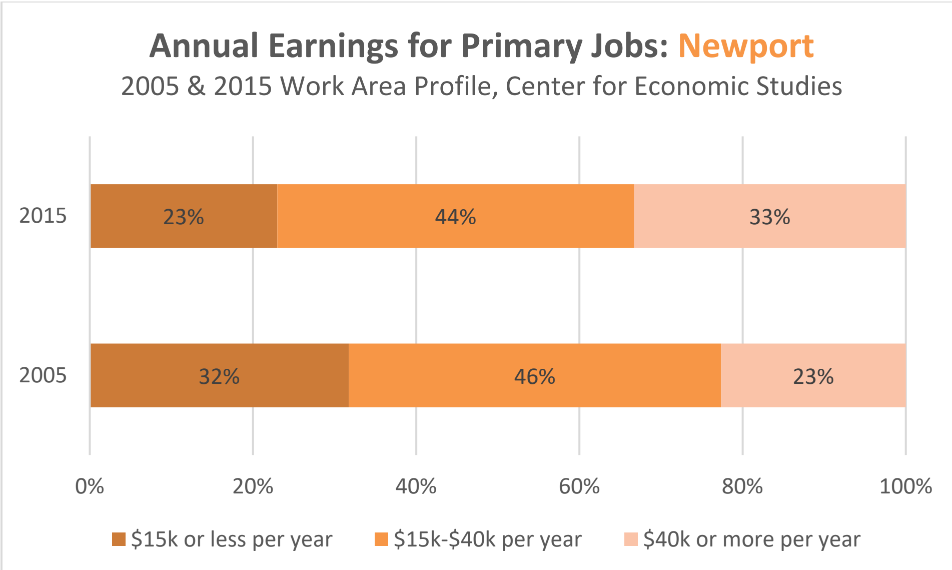
In 2015, roughly 6,400 people held their primary form of employment in the City of Newport. The largest share, about 4,400 people, employed in Newport lived outside of the city and commuted in. Less than half of those who work in the City of Newport also live in Newport (~2,000). About the same number of people (2,000) who live in Newport are employed outside of the area. See Figure 15 below for a graphical depiction of employment inflows and outflows.

Figure 15. Map showing the 2015 employment inflow and outflow for the City of Newport (Source: U.S. Census Bureau, Center for Economic Studies).



Accommodation and food services and *retail trade* comprise about one-third of the jobs in Newport, followed by *health care and social assistance* jobs, which are about 15 percent of the jobs in the area. Among those with primary jobs in Newport, the share of workers who are earning $40,000 or more per year has increased while those earning less that $15,000 or less per year has decreased since 2005 (Figure 16).

Figure 16. Bar graph comparing the shares of annual earning groups among primary jobs in the City of Newport between 2005 and 2015. (Source: U.S. Census Bureau, Center for Economic Studies).



Roughly 9 out of 10 workers in Newport use a car to get to work. Among those who travel by car, almost two-thirds of workers travel alone (Figure 16) which is about the same share as Lincoln County and the state overall. The share of Newport workers who carpool has increased about 4 percent since 2012. About 2 percent of Newport workers use public transportation (not including taxicabs) to travel to work, which has not changed since 2012.

Figure 17. Table comparing the commuting shares among people employed in Newport, Lincoln City, Lincoln County, and Oregon. (Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, DP03).

	Newport	Lincoln City	Lincoln County	Oregon
Car (traveled alone)	73%	67%	75%	72%
Car (carpool)	17%	8%	13%	10%
Public transportation	2%	2%	1%	4%
Other	2%	1%	1%	3%
Worked at home	4%	9%	5%	6%

Targeted Outreach to Environmental Justice Populations

Broad based public outreach regarding the Newport TSP project process will be augmented by targeted methods and practices outlined below in order to reach minority groups, low-English proficiency (LEP) groups, low-income, elderly and persons with disabilities and to provide opportunities for meaningful information and input. In order to reach Environmental Justice populations, the team will employ the following techniques.

People are more likely to get involved when they are invited by their neighbors or peers. The project team will work with the City of Newport, community-based organizations whose missions serve the needs of underrepresented groups, churches catering to specific ethnic groups and languages, schools, service providers and other stakeholders to reach out to their communities.

These groups can also identify the most effective methods to support participation within their specific area, group or community. They may suggest particular information type, meeting locations, meeting times, or media outlets that work best for a specific targeted group.

The PSIS will be updated to reflect community input and will include newly identified outreach methods. The PI Plan will be updated to incorporate this information. Example groups to communicate with include:

- Low-Income communities
- Housing developments (tbd)
- Community Agencies (specific tbd)
- Churches (specific tbd)
- Multi-modal interest groups
- Spanish-speaking communities

The team will go to targeted areas for multi-day community (public) workshops, bringing appropriate project information to where people already gather. The PI Plan initially identifies community workshops, project website with translation options, a project video in English and Spanish, and English & Spanish project Fact Sheets. The team can also provide project information and information posted at key locations – which can include popular gathering areas, senior or disabled housing, local bulletin boards, storefront windows and other high traffic areas to encourage community input (the PI Plan will be updated to include other areas identified by the community). The team will work with the community to distribute copies of the flyers or displays. Information will include how to request translation and interpretive services.

Key project materials will be translated into Spanish (and other languages, as identified), interpretive services will be available at project open houses, and child care will be provided. At the end of the design phase, a Title VI Summary Report will outline the specific outreach efforts the project used to encourage the participation of a diverse group of stakeholders.

Website notes and comments from JLA Creative Director:

Project Logo – recommend creating a logo that is complimentary to the Newport Logo below. Is it the official city logo?

Look and Feel

A good logo or wordmark can help provide visual clues about a project purpose, provide consistency between city branding, and help distinguish similar projects from one another. A TSP logo can also unintentionally imply transportation priorities by showcasing specific modes and omitting others.

Questions to be confirmed by PMT and City:

- **What general level of effort needs to go into developing the look and feel of the website? Should JLA move forward with developing a logo and full branding, or a just a simple word-mark in a style that compliments existing materials?** It can influence the look and feel of public materials beyond the website itself (fact sheets and so on). We can make some recommendations based on set parameters (colors, fonts, etc.) and generate something simple for the City to review and approve before we begin full build out of the website.
- **Are there symbols, colors, fonts, or other design elements we *need* to incorporate** into the website or other project materials? The Yaquina Bay Bridge is a logical landmark to use. Should we also include walkers and bicycles? Wheelchairs? Are there specific colors or typefaces that we should be using? (Or that we should avoid?)
- **Are there existing city documents** that have a distinctive layout or graphic style that we should be aware of and that can serve as models for what we create?
- **Are photographs of existing conditions available?** These are often helpful for illustrating the need for a project, and are useful in making website content more interesting.
- **Do we want to use the TSP logo in parallel with the city logo**? Or as a standalone image? The logo below has a distinctive art deco style that makes use of several possible design features which could be complimented in a wordmark or logo. These include the blue and gold colors, outlined text, sunburst, and shaped borders.

If both logos will generally appear next to each other, then the TSP logo should likely be simpler.

NEWPORT
OREGON

Website Structure

The following is a typical website structure and recommended components. These site elements may not all be necessary:

Homepage

- Project overview (very brief: one or two paragraphs).
- Short notices about upcoming and ongoing events, links to further information. Updated on an as-needed basis.
- Interested parties - signup through MailChimp(?).

About

- A more detailed project overview.
- Photos of the area and issues that may be addressed (if possible).
- Project timeline/schedule.

Get Involved

- Detailed information about overall involvement opportunities and goals/
- A list of public events and open houses (past and future), including relevant documents and links.
- Committee meeting information (past and future) , including relevant documents and links – *If there is enough content, this section may warrant its own page.*

Library

- Downloadable project information (fact sheets, newsletters).
- Technical documents, reports and memos.
- Content is updated on an as-needed basis.

Contact Us

- Project contact name, phone number, and address.
- Comment form sent to *info@projecturl*.

Recent TSP Sites

- http://woodburntsp.org/ - *Custom logo, simple branding and basic styling.*
- http://corvallistsp.org/ - *Layout and format designed to match existing Corvallis TSP site.*

Suggested URLS

A good URL should be indicative of content, unambiguous with regard to spelling, and brief. The ".org" domain extension is has been commonly used for projects and other government work in the past, but that was mainly due to a lack of better choices. The ".info" extension is probably more descriptive of this type of website content.

- NewportTSP.org/info *[Recommended as the shortest, most descriptive option.]*
- Newport-TSP.org/info
- NewportTransportation.org/info
- KeepNewportMoving.org/info
- NewportTransportationFuture.org/info
- NewportTransportationSystemPlan.org/info
- NewportBetterTransportation.org/info

Examples of bilingual Videos JLA has produced can be seen here:

https://vimeo.com/249122991
In spanish: https://vimeo.com/211375290

APPENDIX B- TECHNICAL MEMORANDUM #2: PLAN REVIEW SUMMARY

MEMORANDUM

DATE: May 31, 2019

TO: Newport TSP Project Management Team

FROM: Kyra Haggart, Andrew Parish and Darci Rudzinski, APG

SUBJECT: Newport Transportation System Plan Update
Technical Memo 2 – Plan Review Summary

This memorandum summarizes planning documents, policies, and regulations that are applicable to the Newport Transportation System Plan (TSP) update. The City's current TSP, adopted in 2012, will serve as the foundation for the update process, upon which new information obtained from system analysis and stakeholder input will be applied to address changing transportation needs through the year 2040. As new strategies for addressing transportation needs are proposed, compliance and coordination with the plans and policies described in this document will be required.

The contents of this memorandum are as follows:

Transportation System Planning in Oregon

Transportation system planning in Oregon is required by Statewide Planning Goal 12 – Transportation[1]. The Transportation Planning Rule (TPR), OAR 660-012, describes how to implement Statewide Planning Goal 12[2].

By implementing Statewide Planning Goal 12 (Transportation), the TPR promotes the development of safe, convenient, and economic transportation systems that are designed to reduce reliance on the automobile. Key elements include direction for preparing, coordinating, and implementing transportation system plans. In particular, OAR 660-012-0060 addresses amendments to plans and land use regulations and includes measures to be taken to ensure allowed land uses are consistent

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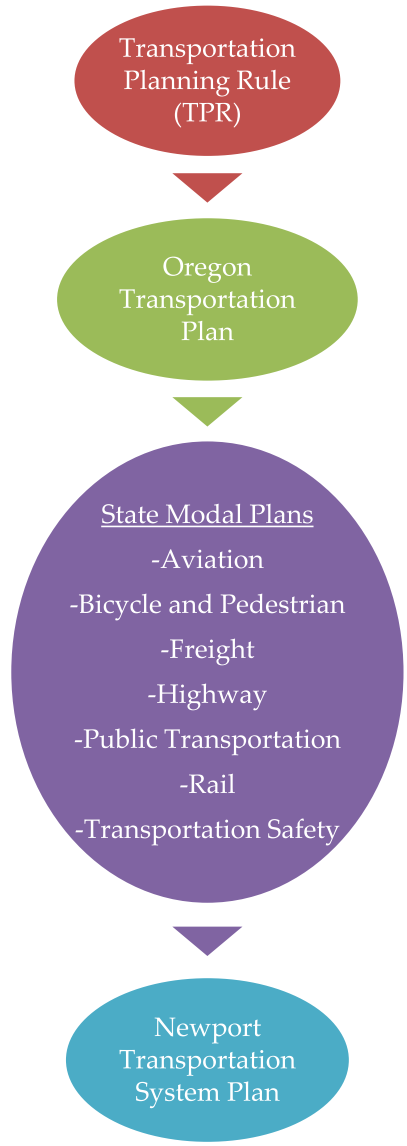
1 Statewide Planning Goals: http: //www.oregon.gov/LCD/goals.shtml
2 Transportation Planning Rule: http: //arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_012.html

with the identified function and capacity of existing and planned transportation facilities. This rule includes criteria for identifying 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.



Recent amendments to the TPR include new language in 660-012-060 that allows a local government to exempt a zone change from the "significant effect" determination if the proposed zoning is consistent with the comprehensive plan map designation and the TSP. The amendments also allow a local government to amend a functional plan, comprehensive plan, or land use regulation without applying mobility standards if the subject area is within a designated multi-modal mixed-use area (MMA). In order to implement these recent amendments to the TPR, the plan amendment language in the City's zoning code may need to be revised during the implementation phase of this TSP update.

OAR 660-012-0045 requires each local government to amend its land use regulations to implement the TSP. It also requires local government to 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. This policy is achieved through a variety of measures, including access control measures, standards to protect future operations of roads, and expanded notice requirements and coordinated review procedures for land use applications. Measures also include a process to apply conditions of approval to development proposals, and regulations assuring 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.

Specifically, the TPR requires:

- The state to prepare a TSP, referred to as the Oregon Transportation Plan (OTP); and
- Counties and cities to prepare local TSPs that are consistent with the OTP.

As the guiding document for local TSPs, the OTP[3] establishes goals, policies, strategies and initiatives that address the core challenges and opportunities facing transportation in Oregon. The goals and policies are further implemented by various modal plans, including the Aviation System Plan, Bicycle and Pedestrian Plan, Freight Plan, Highway Plan, Public Transportation Plan, Rail Plan, and the Transportation Safety Action Plan. Each of the OTP's seven goals and their relationship to this TSP update are discussed in more detail in the State Plans, Policies, and Regulations section later in this memorandum.

State Plans, Policies, and Regulations

The following sections summarize state plans, policies, and regulations including the following:

1. Oregon Transportation Plan
2. Oregon Highway Plan
3. Oregon Bicycle and Pedestrian Plan
4. Oregon Freight Plan
5. Oregon Rail Plan
6. ODOT TSP Guidelines
7. Oregon Public Transportation Plan
8. Transportation Planning Rule (OAR 660-012)
9. Access Management Rules (OAR 734-051)
10. Statewide Transportation Improvement Program (STIP)

Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is a comprehensive plan that addresses the future transportation needs of the State of Oregon through the year 2030. It considers all modes of transportation, including airports, bicycle and pedestrian facilities, highways and roadways, pipelines, ports and waterway facilities, public transportation, and railroads.

The following seven goals with associated policies and strategies are provided in the plan to address the core challenges and opportunities facing transportation in Oregon:

- Goal 1 – Mobility and Accessibility

[3] Oregon Transportation Plan: http://www.oregon.gov/ODOT/TD/TP/OTP.shtml

- Goal 2 – Management of the System
- Goal 3 – Economic Vitality
- Goal 4 – Sustainability
- Goal 5 – Safety and Security
- Goal 6 – Funding the Transportation System
- Goal 7 – Coordination, Communication and Cooperation

There are also six key initiatives identified to reflect the desired direction of the plan and to frame the plan implementation. These initiatives are:

1. 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.
2. Optimize system capacity and safety through information technology and other methods.
3. Integrate transportation, land use, economic development and the environment.
4. Integrate the transportation system across jurisdictions, ownerships and modes.
5. Create a sustainable funding plan for Oregon transportation.
6. Invest strategically in capacity enhancements.

What this means for the Newport TSP Update: The TSP update will be developed to be consistent with the goals and policies of the OTP. It will emphasize, as the updated OTP has, maintaining and building upon existing investments and using system management, technology, and transportation options to maximize the existing state highway system in the city.

Oregon Highway Plan (Amended 2015)

The goals and policies of the Oregon Transportation Plan (OTP) are further implemented by various modal plans, including the Oregon Highway Plan. The OHP defines policies and investment strategies for Oregon's state highway system. The plan contains three elements: a vision element that describes the broad goal for how the highway system should look in 20 years; a policy element that contains goals, policies, and actions to be followed by state, regional, and local jurisdictions; and a system element that includes an analysis of needs, revenues, and performance measures.

ODOT Highway Classification for Newport

OHP Goal 1, Policy 1A (State Highway Classification System) categorizes state highways for planning and management decisions. Statewide Highways typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips. The management objective is to provide safe and efficient, high-speed, continuous-flow operation. In constrained and urban areas, interruptions to flow should be minimal. Inside Special Transportation Areas (see Special Designations below), local access may also be a priority. The following classifications apply to state highway facilities in Newport:

- US 101 through Newport is classified as a Statewide Highway, part of the National Highway System (NHS), a National Network federally designated truck route, a Reduction Review Route and a scenic byway (i.e., Pacific Coast Scenic Byway).
- US 20 through Newport is classified as a Statewide Highway, part of the NHS, a National Network federally designated truck route, an Oregon Highway Plan Freight Route, and a Reduction Review Route.

What this means for the Newport TSP Update: **While this policy places importance on the efficient travel of through motor vehicle trips on highways, the policy must still be balanced with other goals and objectives of the Oregon Transportation Plan to ensure its multi-modal intentions are addressed along non-expressway designated segments. The state highways provide critical connections for residents and the TSP will identify solutions and standards to achieve balanced mobility and provide appropriate connectivity for all modes.**

Special Designations: OHP Goal 1, Policy 1B identifies special highway segment designations for specific types of land use patterns to foster compact development on state highways in which the need for appropriate local access outweighs the considerations of highway mobility. There are currently no special highway segment designations within Newport.

What this means for the Newport TSP Update: **Neither US 101 or US 20 are identified with special highway segment designations. The merits of a special designation could be evaluated as part of the TSP process.**

State Highway Freight System: OHP Goal 1, Policy 1C addresses the need to balance the movement of goods and services with other uses. It states that the timeliness of freight movements should be considered when developing and implementing plans and projects on freight routes. Within Newport, both US 101 and US 20 are classified as NHS Federal Truck Routes.

> What this means for the Newport TSP Update: **Transportation solutions along highways through Newport must be accommodating to freight, consistent with the freight designations.**

Reduction Review Routes: An Administrative Rule was adopted in 2015 to provide clear direction in the implementation of ORS 366.215. The rule requires review of all potential actions that will alter, relocate, change or realign a Reduction Review Route that could result in permanent reductions in vehicle-carrying capacity. Reduction of vehicle-carrying capacity means a permanent reduction in the horizontal or vertical clearance of a highway section, by a permanent physical obstruction to motor vehicles located on useable right-of-way subject to Commission jurisdiction, unless such changes are supported by the Stakeholder Forum. If ODOT identifies that an action may result in a reduction of vehicle-carrying capacity, a Stakeholder Forum will be convened to help advise ODOT regarding the effect of the proposed action on the ability to move motor vehicles through a section of highway. In Newport, US 20 and US 101 (north of its intersection with US 20) are classified as Reduction Review Routes.

> What this means for the Newport TSP Update: **Transportation improvements recommended on Reduction Review Routes will include a record of the proposed roadway dimensions and sufficient detail to allow for a review of Vehicle-Carrying Capacity during future design of roadway improvements.**

Scenic Byways: OPH Goal 1, Policy 1D designates Scenic Byways and requires consideration of aesthetic and design elements, along with safety and performance considerations, for these areas. US 101 through Newport is a Oregon Scenic Byway and a nationally-recognized All-American Road.

> What this means for the Newport TSP Update: **Transportation improvements recommended along US 101 through Newport must consider aesthetics and design elements that support the Scenic Byway designations.**

State Highway Mobility Targets: OHP Policy 1F sets mobility targets for ensuring a reliable and acceptable level of mobility on the highway system.[4] The OHP assesses mobility in terms of volume to capacity ratio (v/c). The following mobility targets are applicable to long-range planning for state highways in Newport during peak hour operation,[5] pursuant to Policy 1F, Table 6:

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

Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions

The TSP update process is an opportunity to reassess an appropriate mobility standard for facilities within Newport. One option is to examine the applicability of an UBA designation. The planning process may also explore developing and applying alternative mobility standards. The Oregon

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[4] In particular, the mobility targets in Table 6 of OHP Policy 1F are applicable to state facilities in Newport and are considered standards for purposes of determining compliance with Transportation Planning Rule (OAR 660-012).

[5] OHP Policy 1F uses the 30th highest annual hour as the peak hour. Alternatives to the 30th highest annual hour may be established as part of adopting an alternative mobility target.

Transportation Commission (OTC) must approve proposed alternative mobility targets on state highways.

What this means for the Newport TSP Update: **The City of Newport has adopted Alternative Mobility Targets for a portion of US 101 in South Beach (see the following section). This TSP update will evaluate whether additional alternate mobility targets for US 101 and OR 20 are appropriate and may incorporate alternative mobility targets into the solutions evaluation process.**

Oregon Highway Plan Amendment US 101 South Beach (2013)

The City's TSP 2012 update revealed that planned future development in South Beach (and increased through-traffic) could result in as much as three times more peak hour traffic in 2030, meaning that the OHP mobility targets for US 101 would not be achievable. The TSP update called for incremental capacity improvements to the highway and identified the need for additional bridge capacity to address the congestion. However, the existing 1936 bridge is too narrow for additional travel lanes and the financial cost associated with constructing more bridge capacity is so great that it cannot be expected within the planning horizon (2030), making the OHP mobility targets unrealistic. The 2013 amendment to the OHP establishes alternative mobility targets on the Oregon Coast Highway (US 101) in the South Beach portion of Newport to respond to the traffic constraints of the Yaquina Bay Bridge and the understanding that it is not realistic to include additional bridge capacity as part of the 2030 transportation system due to costs.

What this means for the Newport TSP Update: **The TSP update process will incorporate the adopted alternative mobility target and the planned improvements for US 101 in the South Beach area.**

Major Improvements Policy

OHP Goal 1, Policy 1G outlines the priorities for maintaining highway performance and improving safety through system efficiency and management before adding capacity. According to this policy, the highest priority is placed on protection of the existing system, followed by improvements in efficiency and capacity of existing facilities. Once these options have been investigated, the third and fourth priorities are to add capacity to the existing system and then to add new facilities. Higher priority measures must be implemented first unless a lower priority measure is clearly more cost-effective or unless it more effectively supports safety, growth management, or other livability and economic viability considerations.

What this means for the Newport TSP Update: Transportation solutions for Newport will be developed with the following process: 1) Consider options to protect the existing system, 2) Consider minor improvements to enhance efficiency and capacity of existing facilities, 3) Consider major roadway improvements to existing facilities, 4) Consider options that would add new facilities to the system.

Access Management Policies

It is the policy of the State of Oregon to manage the location, spacing and type of road and street intersections and approach roads on state highways to assure the safe and efficient operation of state highways consistent with the classification and function of the highways.

What this means for the Newport TSP Update: Access management standards and policies will be evaluated as part of the TSP update. Access management policies and standards will be consistent with ODOT policies for these types of facilities.

Freight Movement Policy

It is the policy of the State of Oregon to maintain and improve the efficiency of freight movement on the state highway system and access to intermodal connections. The State shall seek to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban areas and rural communities. US 20 is a state designated Freight Route within Newport, however US 101 is not.

What this means for the Newport TSP Update: The TSP Update will evaluate potential policies, actions, and specific transportation projects using a variety of criteria. Freight movement on identified state freight routes will be one such criteria.

Transportation Demand Management

It is the policy of the State of Oregon to support the efficient use of the state transportation system through investment in transportation demand management strategies. These techniques can help decrease congestion, energy consumption, and vehicle miles traveled, and can maintain air quality by managing the level of demand for transportation facilities, particularly at peak hours. OHP Goal 4, Policy 4D, encourages efficient use of the state transportation system through investment in transportation demand management strategies.

What this means for the Newport TSP Update: The TSP update will consider transportation demand management strategies and will describe actions Newport will pursue that will reduce single-occupant vehicle trips in order to create greater mobility, reduce auto trips, make more efficient use of the roadway system, and minimize air pollution.

Projects off State Highways

OHP Goal 2, Policy 2B establishes ODOT's interest in projects on local roads that maintain or improve safety and mobility performance on state roadways and support for local jurisdictions in adopting land use and access management policies.

What this means for the Newport TSP Update: The TSP will include sections describing existing and future land use patterns, access management and implementation measures, and solutions that improve safety and mobility performance on US 101 and US 20.

Traffic Safety

OHP Goal 2, Policy 2F identifies the need for projects in the state to improve safety for all users of the state highway system through engineering, education, enforcement, and emergency services.

What this means for the Newport TSP Update: The TSP update will identify existing crash patterns and rates and to develop strategies to address safety issues. Proposed projects will aim to reduce the vehicle crash potential and/or improve bicycle and pedestrian safety.

Alternative Passenger Modes

OHP Goal 4, Policy 4B, requires that highway projects encourage the use of alternative passenger modes to reduce local trips. The TSP will also consider ways to support and increase the use of alternative passenger modes to reduce trips on highways and other facilities.

What this means for the Newport TSP Update: The TSP update will consider solutions that enhance multi-modal and active transportation in Newport.

ODOT Transportation System Management Policies

Access Management on Highways: The Oregon Access Management Rule[6] (OAR 734-051) strives to balance the safety and mobility needs of travelers along state highways with the access needs of property and business owners. ODOT's rule sets guidelines for managing access to the state's highway facilities in order to maintain highway function, operations, safety, and the preservation of public investment consistent with the policies of the 1999 OHP. Access management rules allow ODOT to control the issuing of permits for access to state highways, state highway rights of way, and other properties under the State's jurisdiction.

In addition, the ability to close existing approaches, set spacing standards and establish a formal appeal process in relation to access issues is identified. These rules enable the State to set policy and direct the location and spacing of intersections and approaches on state highways, ensuring the relevance of the functional classification system and preserving the efficient operation of state routes.

OAR 734-051 amendments enacted in 2012 allow more consideration for economic development when developing and implementing access management rules. It resulted in substantial changes in rules about how ODOT manages highway approach road permitting. Changes include modifying how ODOT deals with approach road spacing, highway improvement requirements with development, and traffic impact analyses requirements for approach road permits.

OHP Policy 3A and OAR 734-051 set access spacing standards for driveways and approaches to the state highway system[7]. The standards are based on state highway classification and differ depending on posted speed and average daily traffic volume. The higher (more than 5,000 daily vehicle) standards apply for US 101 and US 20 within Newport city limits.

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[6] Access Management Rule: http://arcweb.sos.state.or.us/rules/OARS_700/OAR_734/734_051.html

[7] ODOT Access Management Standards – OHP Appendix C Revisions to Address Senate Bill 264 (2011): http://www.oregon.gov/ODOT/TD/TP/docs/ohp_am/apdxc.pdf

Table 1: Spacing Standards for Urban Statewide Highways (US 101 and US 20)	
Posted Speed	Annual Average Daily Traffic More than 5,000 Vehicles
55 and higher	1,320
50	1,100
40 & 45	800
30 & 35	500
25 and lower	350

Source: 1999 Oregon Highway Plan, OAR 734-051-4020 (Table 14)

What this means for the Newport TSP Update: ODOT access spacing standards for highways will be acknowledged in the TSP, along with supporting policies that work towards meeting the standards. The planning process will consider regional mobility needs while remaining mindful of existing and future opportunities for local growth and community needs, including considerations of economic development and livability.

Oregon Transportation Options Plan (2015)

The Oregon Transportation Options Plan (OTOP) is a topic plan that establishes policies, strategies, and programs that promote efficient use of existing transportation system investments, thereby reducing reliance on the single-occupancy vehicle and facilitating use of walking, biking, transit, and rideshare. Adoption of this plan establishes a statewide vision for transportation options (TO) in Oregon to provide travelers of all ages and abilities with options to access goods, services, and opportunities across the State. TO strategies and programs do not address capital infrastructure investments, but rather they provide information and resources to allow people to bike, walk, take transit, drive, share rides, and telecommute.

What this means for the Newport TSP Update: Newport's TSP Update will consider the state's goal of reducing single-occupancy vehicle and facilitating use of walking, biking, transit, and rideshare. The goals of the TSP update reflect many of these policies and strategies; the resulting plan for the local multi-modal system is expected to enhance opportunities for non-motorized transportation modes and transit.

Oregon Bicycle and Pedestrian Plan (2016)

The goals and policies of the Oregon Transportation Plan (OTP) are further implemented by various modal plans, including Oregon Bicycle and Pedestrian Plan. The Oregon Bicycle and Pedestrian Plan was updated in 2016. It includes policies, strategies, investment considerations, and implementation recommendations.

Key Goals:

Policies are identified for each of the goals in the plan. The goals include:

- Safety - Eliminate pedestrian and bicyclist fatalities and serious injuries and improve the overall sense of safety of those who bike or walk.
- Accessibility and Connectivity - Provide a complete bicycling and pedestrian network that reliably and easily connects to destinations and other transportation modes.
- Mobility and Efficiency - Improve the mobility and efficiency of the entire transportation system by providing high quality walking and biking options for trips of short and moderate distances. Support the ability of people who bike, walk or use mobility devices to move easily on the system.
- Community and Economic Vitality - Enhance community and economic vitality through walking and biking networks that improve people's ability to access jobs, businesses, and other destinations, and to attract visitors and tourists, new residents, and new business to the state, opening new opportunities for Oregonians.
- Equity - Provide opportunities and choices for people of all ages, abilities, races, ethnicities, and incomes in urban, suburban, and rural areas across the state to bike or walk to reach their destinations and to access transportation options, assuring transportation disadvantaged communities are served and included in decision making.
- Health - Provide Oregonians opportunities to become more active and healthy by walking and biking to meet their daily needs.

- Sustainability- Help to meet federal, state, and local sustainability and environmental goals by providing zero emission transportation options like walking and biking.
- Strategic Investment - Recognize Oregon's strategic investments in walking and biking as crucial components of the transportation system that provide essential options for travel, and can help reduce system costs, and achieve other important benefits.
- Coordination, Cooperation, and Collaboration - Work actively and collaboratively with federal, state, regional, local, and private partners to provide consistent and seamless walking and biking networks that are integral to the transportation system.

Key Considerations

The plan recognizes that the majority of walking and biking trips occur in urban areas. It identifies the role of cities in implementing the Plan as follows:

- Developing local plans (such as TSPs)
- Implementing pedestrian and bicycle projects, including safety, education and enforcement.
- Defining walking and biking networks to ensure connections with adjacent communities.
- System inventories to identify local needs
- Local development ordinances that facilitate walking and biking
- Community group partnerships
- Coordination with local school districts
- Safety education and action plan implementation
- Data collection

The plan identifies the State Transportation Improvement Program (STIP) and *Connect*Oregon as important statewide funding programs that can be used to fund local investments in bicycle and pedestrian projects.

Performance Measures

The Plan Performance Measures are as follows:

- Number of pedestrian and bicycle fatalities (5-year average)
- Number of pedestrian and bicycle serious injuries (5-year average)
- Percent of public that feels safe walking and biking in their community
- Percent of streets within ½ mile of a transit stop that have sidewalks

- Identifying data needs for pedestrian and bicycle performance measures (ODOT-lead initiative to be completed by 2020)
- Percent of commute trips less than 20 minutes accomplished by walking or biking.

What this means for the Newport TSP Update: The Bicycle and Pedestrian Plan identifies the guiding policy for bicycle and pedestrian planning in Oregon. Newport's TSP will establish a baseline understanding of bicycle and pedestrian challenges, develop strategies for system design that integrate biking and walking with other transportation modal systems, and provide a safe and accessible biking and walking environment. Recommendations will support implementation of the key goals and policies of the Bicycle & Pedestrian Plan.

Oregon Freight Plan – 2017

The purpose of the Oregon Freight Plan (OFP) is to improve freight connections to local, state, tribal, regional, national and international markets with the goal of increasing trade-related jobs and income for Oregon workers and businesses. The OFP is a resource designed to guide freight-related operation, maintenance and investment decisions. The OFP, originally released in 2011, was amended in 2017 to maintain compliance with federal requirements that came from the FAST Act for state freight plans.

US 101 and US 20 are both freight routes through the City of Newport. Additional intermodal connector roads in Newport are identified in the plan as in need of improvement.

Additionally, freight facilities at the Port of Newport are identified as in need of reconstruction within the plan.

What this means for the Newport TSP Update: The TSP will help Newport maintain and enhance the efficiency of the freight system in the study area.

Oregon Rail Plan – 2014

The Oregon Rail Plan serves as a combination of the State's rail planning, freight rail and passenger rail systems and contains three elements:

- Summary of the state's goals and objectives related to passenger and freight rail.

- Evaluation of the state's performance to-date.
- Identification of projected costs, revenues and investment needs for rail transportation of people and goods.

The plan also establishes a system of integration between freight and passenger elements into the land use and transportation planning processes and calls for cooperation between state, regional and local jurisdictions in completing the plan.

What this means for the Newport TSP Update: There is no direct rail service into the City of Newport – the nearest rail line terminates at Toledo, six miles east of Newport. The TSP may touch on issues of intermodal freight travel but will not focus on rail transportation.

Oregon Resilience Plan (2013)

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

The plan classifies highway lifeline routes as Tier 1, 2, and 3, where Tier 1 Routes are those that make up the transportation backbone system, which is considered to provide the greatest benefits for short-term rescue and longer-term economic recovery. US 101 along the Oregon coast and US 20 between Newport and Corvallis are Tier 3 facilities. Resiliency targets for Tier 3 Routes are to achieve a minimal level of service (emergency responders and critical needs only) 1-3 weeks after the seismic event, with additional levels of recovery in the following months and years.

What this means for the Newport TSP Update: The Oregon Resilience Plan provides guidance and priorities to maintain the seismic integrity of Oregon's multi-modal transportation system. Policies and standards adopted by Newport should consider additional guidance, concepts, and strategies for design related to facility resiliency in the event of seismic or tsunami activity.

Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reduction

The Oregon Statewide Transportation Strategy, or STS, is a state-level scenario planning effort that examines all aspects of the transportation system, including the movement of people and goods, and identifies a combination of strategies to reduce greenhouse gas, or GHG, emissions. The STS identifies a variety of effective GHG emissions reduction strategies in transportation systems, vehicle and fuel technologies, and urban land use patterns.

The document is not directive or regulatory; it provides "promising approaches for further consideration by policymakers at the national, state, regional, and local levels." Policymakers must decide whether, how, and when to pursue all or selected strategies.

What this means for the Newport TSP Update: The TSP will consider strategies identified in the STS and will reflect the City of Newport's commitment to reducing GHG emissions in the development of plan recommendations.

Oregon Public Transportation Plan (2018)

The OPTP provides a statewide vision for the public transportation system and a policy foundation to assist state, regional, and local transportation agencies in making decisions. The OPTP is one of several mode and topic plans that refine, apply and implement the Oregon Transportation Plan. The OPTP vision provides guidance for developing public transportation services in Oregon and is supported through the plan goals, policies, strategies, and implementation framework.

The policies and strategies of the OPTP are organized by the plan's ten goals; they are placed in the most relevant goal area identified, but frequently relate to other goals. The OPTP provides policy guidance for developing the public transportation system statewide, supporting local decision making.

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

The OPTP lays out three investment scenarios that describe a continuum of services and improvements that make progress toward the plan's vision, goals, policies and strategies.

- Scenario 1: Preservation and Critical Improvements – Modest increase over current funding to keep pace with population growth.
- Scenario 2: Expanding Services – Significant investment to elevate public transportation across the state.
- Scenario 3: Realizing the Vision – Additional investment to fund most public transportation needs.

What this means for the Newport TSP Update: **The OPTP provides the overarching policy framework for transit in Oregon, and the updated TSP transit element will be written in accordance with the guiding policy found in the Plan. The City of Newport has identified the transit needs of the community, including a coordinated strategy to augment and maintain the transit system, as a priority for the TSP update.**

Oregon Aviation Plan (2007, updated 2014)

The Oregon Aviation Plan was published in 2007 and updated with economic impact analysis in 2014. The 2014 analysis of airports in Oregon was developed to measure economic impacts of airport facilities, within regions and throughout the state. The 2007 plan categorizes airports based in their functional roles and provides a statewide perspective relating to airport planning decisions while further refining the goals and policies of the OTP.

Newport Municipal Airport is classified as a Category II – Urban General Aviation Airport. These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. These airports' primary users are business related and service a large geographic region or they experience high levels of general aviation activity.

What this means for the Newport TSP Update: **The TSP will consider access to the Newport Municipal Airport in developing its policies and projects. Newport will review land use restrictions and requirements related to development in the vicinity of the airport as part of the multi-modal transportation system analysis.**

ODOT Safety Plans

The following set of ODOT safety plans identify key issues and strategies related to transportation safety.

Transportation Safety Action Plan (2011)

The Oregon Transportation Safety Action Plan (TSAP) is a plan that shows a set of actions that Oregonians have identified as steps to a safer travel environment. The document also serves as the State of Oregon's Strategic Highway Safety Plan, a document required by federal law. It is a multi-purpose plan that includes both a 20- year policy plan and a 5-year, federally compliant, Strategic Highway Safety Plan. It envisions no deaths or life-changing injuries on Oregon's transportation system by 2035.

Intersection Safety Implementation Plan Process (2009)

Many States elect to put an emphasis on intersection safety as part of their Highway Safety Plan. However, those documents tend to lack details needed to establish a plan for implementing safety strategies to achieve their safety goals. The FHWA created the *Intersection Safety Implementation Plan Process* to provide a 10-step procedure to guide and assist Traffic Engineers and State Safety experts to achieve their intersection safety goals. Those steps include:

1. Set the Intersection Crash Reduction Goal
2. Expand the Current Approach for Achieving the Crash Reduction Goal
3. Identify Intersection Countermeasure Type to be Completed
4. Analyze Crash and Applicable Roadway Data
5. Develop a Straw Man Outline
6. Conduct a Workshop of Key Stakeholders and Follow-Up Implementation Planning Meeting
7. Develop a Draft Intersection Safety Implementation Plan
8. Present the Draft Intersection Safety Implementation Plan to Upper Management
9. Finalize the Intersection Safety Implementation Plan
10. Implement the Plan, Monitor Progress, and Evaluate Results

ODOT Pedestrian and Bicycle Safety Implementation Plan (2014)

The plan emphasizes safety strategies to reduce pedestrian and bicycle crashes. Similar to implementation plans developed by ODOT such as roadway departure plans and intersection safety, the *Pedestrian and Bicycle Safety Implementation Plan* provides a process for reducing pedestrian and bicycle crashes. It does not identify specific projects. This plan supplements ODOT's other safety programs including the Safety Priority Index System (SPIS).

What this means for the Newport TSP Update: The ODOT safety plans will be used as guidelines to help identify needs and appropriate strategies to improve transportation system safety during development of the Newport TSP update. Consistent with these plans, the TSP will identify sites with high occurrences of safety problems and will consider safety in the selection and prioritization of transportation projects to meet Newport's future system needs for all modes of transportation.

Transportation Planning Rule (OAR 660-012) – Last Updated 2012

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

660-012-0020 – Elements of Transportation System Plans

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

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

Section 0035 describes standards and alternatives available to agencies evaluating and selecting transportation projects, including benefits to different modes, land use alternatives, and environmental and economic impacts.

660-012-0045 – Implementation of the Transportation System Plan

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

660-012-0050 – Transportation Project Development

Section -0050 requires that transportation projects be reviewed for compliance with local and regional plans and, when applicable, undergo a NEPA environmental review process. Amendments to Section 0050 made since adoption of the 1999 Newport TSP protect determinations of need, mode, function and general location for projects identified in TSPs.

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

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

Amendments made to Section -0060 are among the most significant changes that have been made to the TPR since adoption of the City's 1998 TSP. The amendments require local jurisdictions to balance the need for development with the need for transportation improvements, establish the end of the planning period as the measure for determining "significant effect," define the transportation improvements that a local government can consider in determining significant effect, and identify methods to determine whether a needed transportation facility is reasonably likely to be provided within the planning horizon.

What this means for the Newport TSP Update: **Requirements in TPR Sections -0020 and -0035 will guide the development of the TSP and consideration of alternatives in prioritization of projects. Requirements in Sections -0045 and -0060 will suggest potential amendments and identify and facilitate potential changes to Newport's Development Code. These potential amendments are addressed in detail in Technical Memorandum #3 (Regulatory Review).**

Statewide Transportation Improvement Program (STIP)

The Oregon Statewide Transportation Improvement Program (STIP) is the state's four-year transportation improvement program for state and regional systems. The STIP is updated every other year and is adopted by the Oregon Transportation Commission (OTC) and is approved by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) as required by federal law.

The STIP is a project scheduling and funding document, not a plan. The projects in the STIP are consistent with adopted transportation plans. Additionally, the STIP is financially constrained, indicating that the projects included have committed funding available. There are two STIP lists that are relevant: the 2018-2021 STIP (Approved) and 2021-2024 STIP (In Development). Several projects along US 101 in Newport are identified.

What this means for the Newport TSP Update: The TSP Update will be consistent with the identified projects in the 2018-2021 STIP. If projects are identified as part of the 2021-2024 STIP during this process, the TSP will take those into consideration as well.

Local Plans, Policies, and Regulations

The following sections summarize City of Newport and Lincoln County plans, policies, and regulations and describe how they will impact the TSP update project.

Newport Comprehensive Plan Transportation System Plan Chapter (2012)

The City of Newport's Comprehensive Plan is designed to guide development of land within the City Limits and coordination with Lincoln County regarding development of land outside the City Limits but within the Urban Growth Boundary (UGB). The plan also establishes the goals, policies, and strategies to guide the City's future growth. The complete TSP is adopted as an element of the Comprehensive Plan in Chapter 5 Public Facilities. It was adopted by Ordinance No. 1802 in 1999 and was later amended by Ordinance No. 1963 in 2008 and Ordinance No. 2045 in 2012.

The TSP, as amended in 2012, describes the components that make up the City's transportation framework and presents goals and policies for establishing a multi-modal transportation network. It identifies recommend improvements to roadways; transportation system management and traffic signals; pedestrian and bicycle facilities; and transit, and air, water, and rail transportation. It also includes an Access Management Plan intended to define an effective access management program that will enhance mobility and improve the safety of roadways in the City of Newport. The TSP, including the Access Management Plan, places a strong emphasis on the preservation and improved operation of the US 20 and US 101 corridors.

In addition to recommended projects and standards, The TSP includes the City's Transportation Goal and associated policies, which are intended to guide the administration of the TSP and the development of applicable implementing ordinances consistent with the TSP. The City's transportation goal is stated as follows:

- To provide a safe and efficient multi-modal transportation system consistent with the Transportation System Plan.

The policies supporting this transportation goal include the following:

- Policy 1: To improve and maintain a transportation system that is consistent with the adopted 1997 TSP, as amended.
- Policy 2: To develop implementing ordinances and funding options consistent with the following:
    - Street System Plan
    - Pedestrian System Plan
    - Bicycle System Plan
    - Transit System Plan
    - Funding Plan

The chapter also includes more specific policies related to each of the plans referenced in Policy 2.

Newport Transportation System Plan (1999, amended in 2008 and 2012)

The oldest component of the City's TSP was completed in 1997 and adopted in 1999. Since the time of adoption several major updates to the plan were made in 2008 and 2012. The 1999 TSP contains transportation goals, policies, and strategies to address transportation needs for the City through the year 2015, as well as street design standards and project lists needed to implement the Plan.

The 1999 Plan assumed that the City would grow from its population of 9,785 in 1996 to 15,200 by 2016. While most of the TSP has been replaced by the 2008 and 2012 updates, the 1999 TSP still contains the originally-adopted street design standards, which will be re-evaluated as part of the current TSP update process. In addition to updating street design standards, the City has identified the following key issues that will be addressed through this planning and incorporated into the updated TSP as appropriate.

- Alignment for long-term future replacement of the Yaquina Bay Bridge; and
- Desired streetscape, urban form, and arterial/collector roadway configuration for the City's commercial core areas that will catalyze redevelopment and meet the community's long term transportation needs; and
- Transportation enhancements for the Agate Beach neighborhood that are sensitive to the geologic conditions of the area; and

- Capital project needs, in a realistic manner, with planning level estimates for both near term and longer-term priorities; and
- Viability of NE Harney Street as a north-south alternative to US 101; and
- Integrated multi-use bike and pedestrian network that improves connectivity between neighborhoods, visitor destinations, and natural areas; and
- Traffic calming measures and pedestrian safety needs, with an emphasis on high volume roadway and Safe Route to School corridors; and
- Transit needs of the community, including a coordinated strategy to augment and maintain the system; and
- Acceptable street cross-sections with a palette of options that are responsive to different forms of development, environmental limitations and terrain constraints; and
- Infill frontage improvement requirements for key corridors in Newport.

Key Issues Identified in the 2012 TSP

- Maintaining the function of the US 20 and US 101 corridors to meet statewide and regional goals
- Phased construction of a new north-south arterial
- Improving the efficiency of existing facilities through transportation system management
- Signalizing intersections to meet the capacity of projected increases in traffic flow
- Recommendations to develop a continuous sidewalk system, with emphasis placed on the pedestrian/transit interface, connections to tourist destinations, and safe routes for children to walk to school
- Providing safe bicycle routes for bicycle through-traffic traveling along the Oregon Coast, as well as an internal network of bicycle routes within the City
- Identifying and pursuing funding options for transportation improvements.

What this means for the Newport TSP Update: The TSP update process will replace the City's currently-adopted TSP—incorporated as Chapter 5 of the Newport Comprehensive Plan—and will update all references to that chapter in the Plan. The update process will consider the recommended policies, strategies, and projects from the current TSP to meet the current and anticipated future needs of the community. It will also provide an opportunity to review and update the transportation goal and policies to better represent current state and local practices and objectives. Potential policy changes may reflect issues that have been evolving since the TSP was last amended in 2012.

Ordinance No. 2045 (2012)

Newport Ordinance No. 2045, adopted in 2012, repeals and replaces the TSP element of the Newport Comprehensive Plan and amends related provisions of the City's zoning and subdivision codes. The ordinance also sets out policies in support of an alternate mobility standard for US 101 to allow higher levels of congestion on the highway and provide increased opportunities for economic development and reduce the costs of transportation system improvements associated with development. Major amendments included:

- Background sections documenting the development of the proposed South Beach transportation system;
- New text providing a policy framework for the implementation of a Trip Budget Program;
- Policy statements supporting the planned transportation system in South Beach; and
- Updated transportation project lists, including needed projects south of the bridge. Updated tables include a description of the roadway, bicycle and/or pedestrian projects, along with cost estimates, and the priority in which the projects should be built.

Newport Bicycle and Pedestrian Plan (2008)

The Newport Pedestrian and Bicycle Plan, adopted in 2008, replaces the bicycle and pedestrian element of the 1999 Newport TSP. The goal of the plan is to provide a comprehensive list of projects and strategies for system-wide improvements to the walking and bicycling environment. The Plan identifies a recommended system of bikeways and walkways connecting key pedestrian and bicycle destinations and surrounding areas, which builds upon recommendations from previous planning efforts, including the 1999 Newport TSP, the Newport Comprehensive Plan, and the Newport Park System Master Plan. The Plan identifies strategies for improving walking and bicycling, recommended design standards for pedestrian and bicycle facilities, and a variety of potential funding sources to fund development of the system.

What this means for the Newport TSP Update: The TSP update process will consider the standards and strategies identified in the Bicycle and Pedestrian Plan and incorporate them into the applicable sections of the updated TSP. The City has identified traffic calming measures and pedestrian safety needs, with an emphasis on Safe Routes to School Corridors, as a key issue for this TSP update.

Newport Development Code

The relevant chapters of the Newport Development Code that were reviewed include:

- **Chapter 9.10 Right-of-Way Permits**
  - This chapter regulates permits for all rights-of-way controlled by the City of Newport. It addresses application and review procedures, construction notice requirements, and measures for unusual conditions, repairs and safety conditions.
- **Chapter 13 Subdivision Regulations**
  - This chapter provides uniform standards for the division of land and regulates related required improvements. The chapter implements land use and transportation planning goals addressed in the Newport Comprehensive Plan. Section 13.05.015 addresses street design and includes minimum right-of-way and roadway widths, noting that "unless otherwise indicated in the Transportation System Plan, the street right-of-way and roadway widths shall not be less than the minimum width in feet shown in the following table."

Type of Street	Minimum Right-of-Way Width	Minimum Roadway Width
Arterial, Commercial, and Industrial	80 feet	44 feet
Collector	60 feet	44 feet
Minor Street	50 feet	36 feet
Radius for turn-around at end of cul-de-sac	50 feet	45 feet
Alleys	25 feet	20 feet

- **Chapter 14.14 Parking and Access Requirements**
  - This chapter establishes off-street parking and loading requirements, access standards, development standards for off-street parking lots, special parking areas for specific areas of the City.
- **Chapter 14.43 South Beach Transportation Overlay Zone**
  - The purpose of the South Beach Transportation Overlay Zone (SBTOZ) is to promote development in the South Beach area of Newport in a way that maintains an efficient, safe, and functional transportation system. The chapter implements the Trip Budget Program for South Beach that was established in the 2012 amended TSP to ensure that the planned transportation system will be adequate to serve future land use needs.
- **Chapter 14.44 Transportation Standards**
  - The primary purpose of the chapter is to "provide standards for attractive and safe streets that can accommodate vehicle traffic from planned growth and provide a range of transportation options, including options for driving, walking, bus, and bicycling." The chapter implements the City's Transportation System Plan and details planning and design standards for the implementation of public and private transportation facilities and city utilities and indicates when and where they are required. It addresses when certain standards apply, design criteria and specifications, and conditions of development approval. The City's specifications, standards, and details are incorporated into this code by reference in Section 14.44.030.
- **Chapter 14.45 Traffic Impact Analysis**
  - This chapter regulates Traffic Impact Analyses (TIAs) and includes language addressing when a TIA is required, application procedures and requirements, approval process and criteria, and when a fee-in-lieu may be required.

The relationship between the TSP update and the Development Code is detailed in Technical Memorandum #3 (Regulatory Review).

What this means for the Newport TSP Update: As part of the TSP update process the City of Newport's development code standards will be reviewed and potentially revised, including street cross-section standards, to ensure that they meet community needs. These standards include those related to streetscape and urban form, traffic calming measures and pedestrian safety needs, infill frontage requirements, and transit supportive development.

Additional amendments to the City's development requirements may be needed in order to implement the recommendations of the updated TSP and to better comply with the State's Transportation Planning Rule (see Technical Memorandum #3: Regulatory Review).

Commercial and Industrial Buildable Lands Inventory and Economic Opportunities Analysis (2012)

In 2012 the City adopted the Commercial and Industrial Buildable Lands Inventory and Economic Opportunities Analysis (EOA), which presents an economic opportunities analysis consistent with the requirements of statewide planning Goal 9. The primary goals of the EOA are to (1) project the amount of land needed to accommodate the future employment growth within the Newport Urban Growth Boundary (UGB) between 2012 and 2032, (2) evaluate the existing employment land supply within the Newport UGB to determine if it is adequate to meet that need, and (3) to fulfill state planning requirements for a twenty-year supply of employment land.

The report identifies infrastructure investments as a key economic development issue for the City. The report recommends using funds from the South Beach urban renewal area to make investments in South Beach on key opportunity sites that need infrastructure improvements to enable development of marine and ocean observing businesses. The report also includes actions for maintaining and improving infrastructure to the International Terminal, as well as improvements to roads connecting the Bay Front with US 20. The report recommends that the City seek infrastructure grants, as well as pursue opportunities for public-private partnerships. The analysis resulted in updates to the Economy and Housing sections of the City's comprehensive plan, including a number of policies related to the provision of transportation infrastructure for development.

What this means for the Newport TSP Update: The TSP update will consider the impact of Newport's projected employment growth as well as the type of businesses the City hopes to attract in the future. The update process will also evaluate goals and policies found in the Comprehensive Plan to reflect issues that have been evolving since the EOA was completed in 2012.

Coho/Brant Infrastructure Refinement Plan (2012)

The Coho/Brant Infrastructure Refinement Plan, adopted in 2012, was developed to provide direction for future public infrastructure improvements in the Coho/Brant neighborhood (located west of US 101 and north of SW 35th Street). The project was developed with four primary objectives:

- Produce an infrastructure refinement plan with preferred design alternatives based upon feedback from active public engagement;
- Engage the public through an iterative design process;
- Identify public infrastructure improvements and associated planning-level cost estimates;
- Present findings in a manner that enables City staff to easily amend existing adopted plans.

The refinement plan addresses the following design components:

- Rights-of-way
- Street improvements and stormwater management
- Park and trail management
- US 101/SW 35th Street intersection
- Tsunami evacuation route enhancements

The refinement plan includes recommended policies and development standards, which vary from adopted City standards, and recommends an amendment to existing functional plans to reflect these changes. The plan is a tool to be used by the City to obtain needed rights-of-way, update adopted plans, and obtain financing for implementing recommended improvements.

What this means for the Newport TSP Update: **The adopted TSP includes planned infrastructure improvements within the Coho/Brant project area, which are specifically identified in the refinement plan. The TSP update process will re-evaluate the recommendations and projects from the Coho/Brant Infrastructure Refinement Plan and incorporate them into the updated TSP where applicable. Alternative street cross-sections identified for this area will be evaluated for inclusion in the updated TSP.**

South Beach Peninsula Transportation Refinement Plan (2010)

Newport's South Beach Peninsula is a special maritime environment near the mouth of the Yaquina River and the crossing of US 101 and is home to the Hatfield Marine Science Center, the Oregon Coast Aquarium, the South Beach Marina, and a fleet of research vessels owned by the National Oceanic and Atmospheric Association (NOAA). The refinement plan, adopted in 2010, was developed in response to the need for transportation improvements in the area due to an increasing volume of tourists and visitors. The plan includes circulation, streetscape, parking, and wayfinding concepts, as well as planning-level cost estimates for a range of public improvements proposed in the plan. A key component of the plan is to align the roadway and driveway access points in order to create a safer and more efficient vehicular circulation system. In addition, intersection improvements are proposed for several of the peninsula's key intersections.

What this means for the Newport TSP Update: **The TSP update process will consider the recommendations and projects from the South Beach Peninsula Transportation Refinement Plan, including alternative street cross-sections, and incorporate them into the updated TSP where applicable.**

North Side Local Street Plan (2008)

The North Side Local Street Plan, adopted in 2008, is one of several reports that have been prepared to update the City's TSP in response to changing transportation issues in the City, including traffic congestion during peak summer months along US 101, US 20 and other major streets within the city resulting in long delays at many intersections, and a high crash rate along major highway segments. The Plan focuses on the identification and prioritization of transportation infrastructure needs to support economic development within the area north of the Yaquina Bay Bridge identified in the Newport Comprehensive Plan.

The Plan identifies a range of improvement projects to address existing and future system deficiencies including local street extensions or improvements, changes to on-street parking, changes to signalization and/or traffic control, transit service improvements, transportation demand management activities, and transportation system management strategies. It also includes planning level cost estimates for recommended improvements. The North Side Local Street Plan led to a major update of the current TSP in 2008 to support commercial development and redevelopment activity within the area, as well as a more comprehensive Pedestrian and Bicycle Plan for the City.

What this means for the Newport TSP Update: The 2008 North Side Local Street Plan provides policy direction to evaluate options for US 101 and US 20 as couplets through the City of Newport. This TSP update process will revisit and re-evaluate the recommendations and projects from the North Side Local Street Plan and incorporate them into the updated TSP where applicable.

Agate Beach Neighborhood Plan (1998)

The Agate Beach Neighborhood Plan provides a framework for guiding development in the Agate Beach neighborhood. The Plan seeks to promote redevelopment of underutilized properties and appropriate development where the use complements existing land uses. The vision of the Agate Beach Neighborhood Plan is to foster a sustainable urban living environment. The Plan originated in 1995 with a neighborhood meeting of Agate Beach residents, business owners, and property owners and was ultimately adopted into the City's Comprehensive Plan by the City Council.

The Plan addresses transportation issues and existing conditions in the Agate Beach neighborhood, including an inventory of existing streets and street conditions. The City's TSP is incorporated by reference into the Plan, but it also makes additional recommendations for streets and the bicycle/pedestrian network addressing issues specific to the Agate Beach neighborhood, which supplement the citywide TSP.

What this means for the Newport TSP Update: The TSP update process will consider the recommended projects from the Agate Beach Neighborhood Plan and incorporate them into the updated TSP where applicable. Due to the unique nature of the Agate Beach neighborhood, it is identified as a distinct subarea for the purposes of analysis and recommendations in several of the TSP Update's tasks and will be the focus of one of the projects' community workshops. Streetscapes, placemaking, and stormwater management have been identified as priorities for the area.

Newport Peninsula Urban Design Plan (1993)

The Newport Peninsula Urban Design Plan was adopted in 1993, addressing the historic peninsula district and commercial core of the City. The summary of findings for the Plan is adopted as an element of Chapter 4 of the Comprehensive Plan; the full plan is adopted as background reference. The Plan was developed in response to the City of Newport's anticipation that population, employment growth, and increased tourism on the peninsula, combined with automobile-dependent development, will negatively affect residents' quality of life and lifestyle, as well as the physical character of the historic core of the city. The Plan's key finding is that it is "necessary to both stimulate and guide development in order to graciously incorporate change and preserve the peninsula as a wonderful place to live." Specific urban design policies relevant to transportation include:

- 3. Improve the vehicular and pedestrian networks in order to improve safety, efficiency, continuity, and relationships connecting the peninsula neighborhoods.
- 4. Coordinate with the Oregon Department of Transportation (ODOT) highway projects which are compatible with and responsive to these policy objectives and design districts implementing said policies.

The key implementation measures for the urban design policies adopted as part of the Plan was the creation of urban design districts, which are implemented by refinement plans and adopted as zoning and development code overlays.

What this means for the Newport TSP Update: The TSP update process will consider the recommendations and policies from the Newport Peninsula Urban Design Plan and incorporate them into the updated TSP where applicable. Newport's commercial core will be the focus of one of the project's community workshops and analysis to consider urban design opportunities related to highway routing, land use potential, placemaking enhancements, gateway features, and streetscapes – as well as the constraints that would need to be overcome in order to realize those opportunities.

Greater Newport Area Vision 2040 (2017)

The Greater Newport Area Vision, adopted in 2017, guides the community's vision for Newport through the year 2040. It is intended to guide the City of Newport and its public, private, civic, and community-based partner organizations in the cultivation of an "enterprising livable, dynamic, affordable, educated, safe, healthy, collaborative, and inclusive" community in the future. The Vision includes a greater citywide vision, as well as a vision and strategies for each of the six focus areas. All vision strategies have been prioritized into one of three tiers, and the Vision ultimately resulted in the creation of an action-ready Vision and Strategic Plan. The Vision includes a number of key strategies that are relevant to transportation and the update of the TSP, including:

- **Tier I (High Priority)**
    - Revitalize US 101 and US 20 in and around Newport to serve as attractive gateways to the community.
    - Develop an integrated trail system, accommodating multiple uses, that connects neighborhoods, visitor destinations, open spaces, and natural areas.
- **Tier II (Secondary Priority)**
    - Work to improve the safety of bicyclists and pedestrians throughout Newport. Plan, fund, and develop improvements to bicycle and pedestrian amenities in strategic areas of the city, including sidewalks, crosswalks or overpasses, traffic calming, bike racks, and planned bicycle and pedestrian routes.
    - Maintain and expand the multiuse path and trail system.
    - Develop targeted improvements to the local transit system, including better scheduling, signage, and plans for system expansion. Work with Lincoln County to

upgrade bus service in Newport and surrounding areas, with improved routes and more frequent service.

- Design neighborhoods around streets that are well integrated with local transit, are ADA Accessible, and accommodate "active transportation" such as cycling, walking, and wheelchair moving.
- Develop and promote transit as a robust and reliable alternative to driving within the Greater Newport Area.

What this means for the Newport TSP Update: **The Greater Newport Area Vision 2040 represents the most current vision for the future of the City of Newport. The public engagement effort for the TSP update process will build on this vision and its recommendations, and the analysis will evaluate transportation-related strategies identified.**

Urban Renewal Plans

Newport has three urban renewal districts. The following plans contain goals, objectives, and projects for the development of specific areas within the City.

McLean Point District Urban Renewal Plan (2015)

The McLean Point Urban Renewal Plan was adopted in 2015 and contains goals, objectives, and projects for the development of the McLean Point Urban Renewal Area. The overall purpose of the Plan is to use tax increment financing to overcome obstacles to the proper development of the Area. Goal 4 of the Plan addresses infrastructure. The goal is stated as follows:

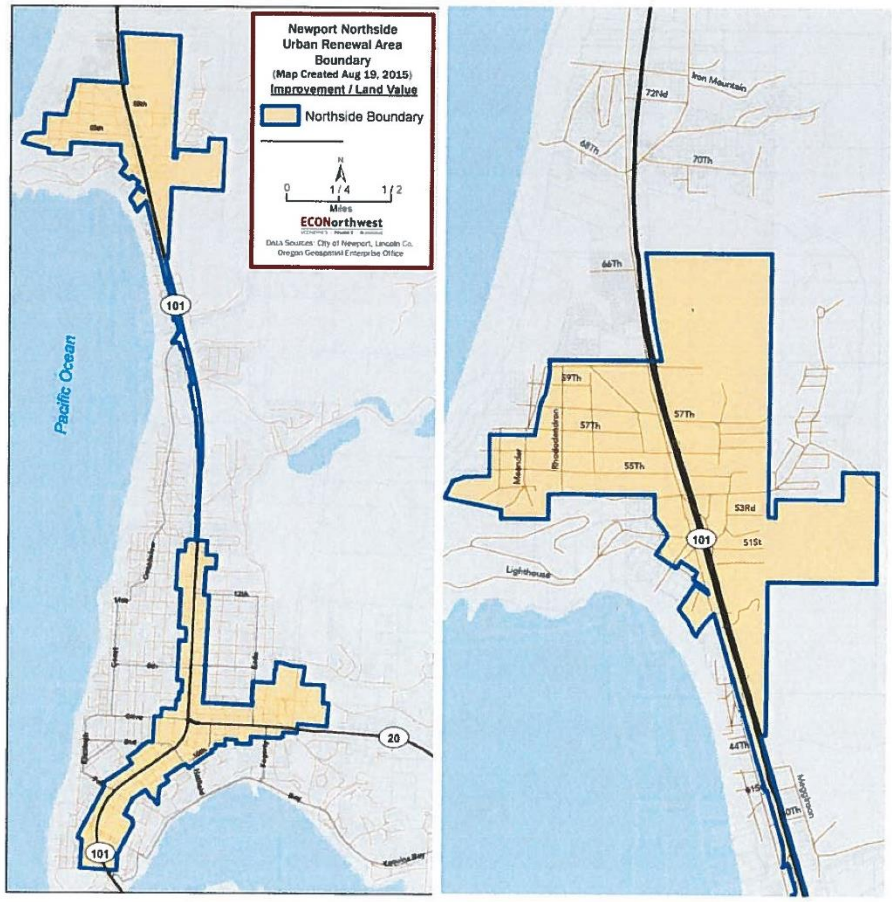
- **Goal 4: Infrastructure.** Assure adequate planning for public facilities to meet the changing needs of the City of Newport urbanizable area. Provide a storm water drainage system, water system, wastewater collection and treatment system with sufficient capacity to meet the present and future needs of the Newport urbanizable area. Provide a safe and efficient multi-modal transportation system consistent with the Transportation System Plan.

The objectives of Goal 4 are to build utility infrastructure to accommodate growth in the Area; identify and make infrastructure investments on opportunity sites; and to assist in the improvement of transportation infrastructure to support existing development and allow for future development.

Urban renewal projects authorized by the Plan include street improvements such as turn lanes and other traffic management improvements at access points onto Bay Boulevard to ensure safe points of ingress and egress for industrial users. The Plan states that a public or private street might also be extended into the Area to serve development. The Plan estimates that it will allocate $250,000 funds from tax increment revenues toward street improvements in the Area, which comprises half of the estimated total cost of needed improvements.

Newport Northside District Urban Renewal Plan (2015)

The Newport Northside District Urban Renewal Plan was adopted in 2015 and contains goals, objectives, and projects for the development of the Newport Northside Urban Renewal Area (see image for area boundary). The overall purpose of the Plan is to use tax increment financing to overcome obstacles to the proper development of the Area. The Plan includes several goals and objectives that are relevant to the TSP update.



- **Goal 2: Economy.** Create conditions that are attractive to the growth of existing business and attract new businesses to Newport to create new jobs. Provide an adequate number of sites of suitable sizes, types, and locations to accommodate a variety of economic opportunities.
    - Objective 1: US 101/US 20 Streetscape
        a. *Assist in the financing and provision of transportation improvements for improving traffic flow and traffic patterns, reconfiguring intersections, installing or upgrading traffic signals, improving pedestrian and bicycle connections, right of way acquisition and parking improvements.*
- **Goal 4: Infrastructure.** To assure adequate planning for public facilities to meet the changing needs of the City of Newport urbanizable area. To provide a storm water drainage system,

water system, wastewater collection and treatment system with sufficient capacity to meet the present and future needs of the Newport urbanizable area. To provide a safe and efficient multi-modal transportation system consistent with the Transportation System Plan.

- Objective 1: Complete a Refinement Plan for the Agate Beach area.
- Objective 2: Complete a Refinement Plan for the commercial core areas.
- Objective 3: Build utility infrastructure to accommodate growth in the Area.
- Objective 4: Identify and make infrastructure investments on opportunity sites.
- Objective 5: Coordinate with the Oregon Department of Transportation on transportation improvements, including street, sidewalk and bridge improvements, in the Area.
- Objective 6: Assist in the improvement of the transportation system to support existing development and allow for future development.
- Objective 7: Assist in the financing and provision of transportation improvements for US 101 and US 20 for improving traffic flow and traffic patterns, reconfiguring intersections, installing or upgrading traffic signals, improving pedestrian and bicycle connections, right of way acquisition and parking improvements.
- Objective 8: Assist in the financing and provision of transportation improvements in the commercial core areas to ease congestion, spread out traffic, enhance pedestrian experience, and facilitate redevelopment.
- Objective 9: Assist in the provision of telecommunications infrastructure.

Public improvements authorized under the Plan include transportation and utility enhancements to encourage development and economic assistance to developers. Transportation system enhancements include enhancements to the commercial core areas as well as to US 101 and US 20, including street upgrades, transportation improvements identified in the Commercial Core Areas Revitalization Plan, widening, intersection realignments, local street right-of-way improvements, parking improvements right-of-way acquisition, and signal installations or adjustments. The Plan estimates the following allocations of funds from tax increment revenues toward Transportation System Enhancements:

- **Commercial core area highway/street upgrades: $12,500,000**
- **Intersection realignment: $2,000,000**
- **Local street right-of-way improvements: $2,000,000**
- **Parking improvements: $800,000**

- **Right-of-way acquisition: $600,000**
- **Signal installation or adjustment: $500,000**
- **Storm drainage improvements: $1,500,000**
- **Water, sewer, utility line relocation and capacity upgrades: $600,000**

Substantial Amendment XIII to the South Beach Urban Renewal Plan and Report (2018)

The South Beach Urban Renewal Plan was originally adopted in 1983. Since its adoption, the Urban Renewal Agency has executed eight minor and five substantial amendments, including Amendment XII in 2018. Amendment XIII moves the deadline for awarding projects from December 31, 2020 to December 31, 2025 to better reflect the length of time it either has or will take to engage community stakeholders on refinements to "conceptual projects" contained in the Plan, secure needed funding, design, bid and construct projects. This change to the phasing also aligns with the new deadline for completing projects. The amendment also addresses the following:

- Documents the current level of funding for the US 101 SE 32nd Street – SE 35th Street Improvement project.
- Reflects the final reconciliation of the Safe Haven, SW Abalone, SW 30th, SW Brant, SW 27th and SE Ferry Slip Road projects all of which are now complete.
- Shows additional funding for line undergrounding along SE Ferry Slip Road and US 101.
- Provides funding for a refinement plan to map out future use of the Agency owned property at the NE corner of the future SE 35th and US 101 intersection.
- Clarifies Phase 3 project objectives and updates estimates.
- Updates tax increment revenue and debt projections.

The amendment addresses continuing deficiencies related to vehicular and pedestrian circulation, utility services, storm water management, and public recreation and open space by providing additional time for the Agency to complete identified Phase 2 and Phase 3 projects.

Phase 2 transportation projects include:

- 35th Street – 101 to Ferry Slip Road: Commercial Street Prototype, relocate 32nd St Signal to SE 35th, Construct 35th Street from Abalone to Ferry Slip Rd. with multi-use path (Coho/Brant Projects #10 and #11)
- Anchor Way 35th to 40th

- Re-align SE 50th Street right-of-way and acquire SE 62nd Street right-of-way, obtain storm drainage easement in the vicinity of SE 40th and US 101
- Match for LIDs formed to implement Tier 2 and Tier 3 Coho/Brant improvements

Phase 3 transportation projects include:

- 40th and US 101 Signal and Intersection Improvements (Moved from Phase 2)
- 50th and US 101 Intersection Improvements
- Abalone Street Multi-Use Path Extension (Coho/Brant Project #12B)
- SE 35th Street from Ferry Slip Road to Estuary Turn sidewalks
- Match for LIDs formed to implement Tier 2 and Tier 3 Coho/Brant improvements

What this means for the Newport TSP Update: The TSP update process will consider the transportation needs and goals identified in these urban renewal plans. Additionally, the project lists for the Urban Renewal Areas may need to be updated to reflect outcomes of the TSP update process. Streetscapes, urban form, and roadway configuration for the City's commercial core areas that will catalyze redevelopment and meet the community's long-term transportation needs have been identified by City staff as key issues for this TSP update process.

System Development Charge Methodology (2017)

The City's original System Development Charge (SDC) methodology was adopted in 2007. The City updated the methodology in 2017 to take into account up-to-date growth forecasts and long-range capital improvement needs. Section V of the SDC Methodology Report address transportation SDCs. The proposed SDC methodology utilizes an average daily vehicle trip-end (ADT) basis for calculating future trip growth. This approach is widely accepted as fair practice since the SDCs are directly tied to the net new vehicle trip generation attributed to a development. Newport's TSP, as amended in 2012, and related subarea plans were used to determine the improvement cost basis for planned capacity-increasing capital improvements. There are 20 street improvements and multiple pedestrian improvements that have been identified in the City's transportation plans and studies that are required to address 2017-2037 trip growth in the City of Newport. Additionally, City staff and Advisory Committee identified nine improvements that were included in various plans but are expected to be implemented outside the 20-year planning horizon or eligible for state funding (with a local match).

What this means for the Newport TSP Update: Projects identified through the TSP update process should be considered for applicability for funding through the City's Streets SDC fund.

Parking Management Plan (2018)

The City of Newport developed a Parking Management Plan in 2018 to help manage ongoing parking demand. The City has three parking districts: City Center, Nye Beach, and Bayfront. The project included community outreach, detailed data collection, analysis of parking patterns during peak and off-peak seasons, and a list of key recommendations addressing local parking needs, issues, and management strategies. Among the strategies identified are:

- Modify City of Newport code provisions to identify pervious pavement and other comparable alternatives to paved surfaces for areas suitable for temporary parking and implement temporary parking on currently undeveloped lots, as needed, to manage parking during extreme demand periods.
- Eliminate off-street parking minimums for new development and redevelopment in metered and permit zones.

What this means for the Newport TSP Update: The TSP update process will consider the list of key issues and strategies identified in the Parking Management Plan and incorporate them into the updated TSP where applicable.

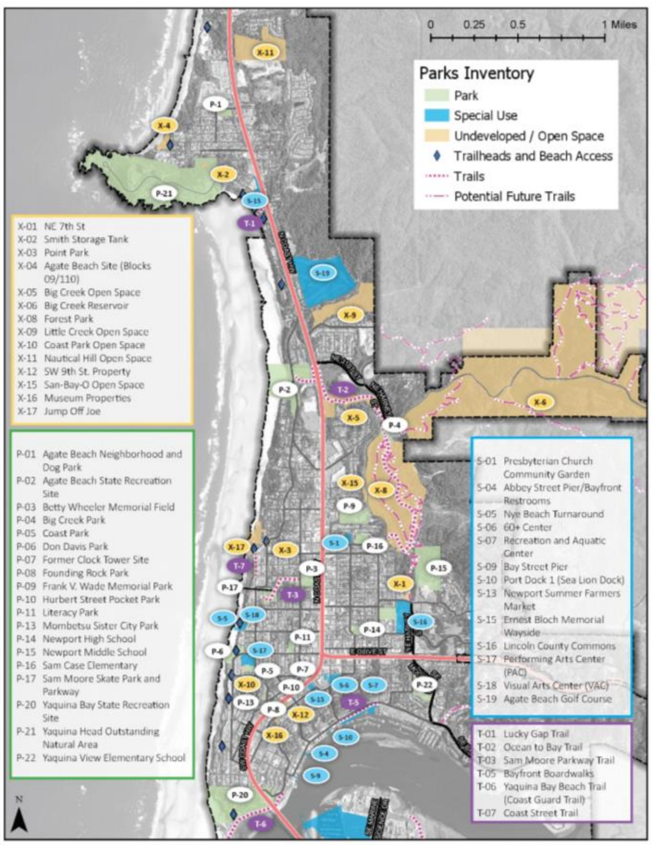
Draft Pavement Management Plan (2019)

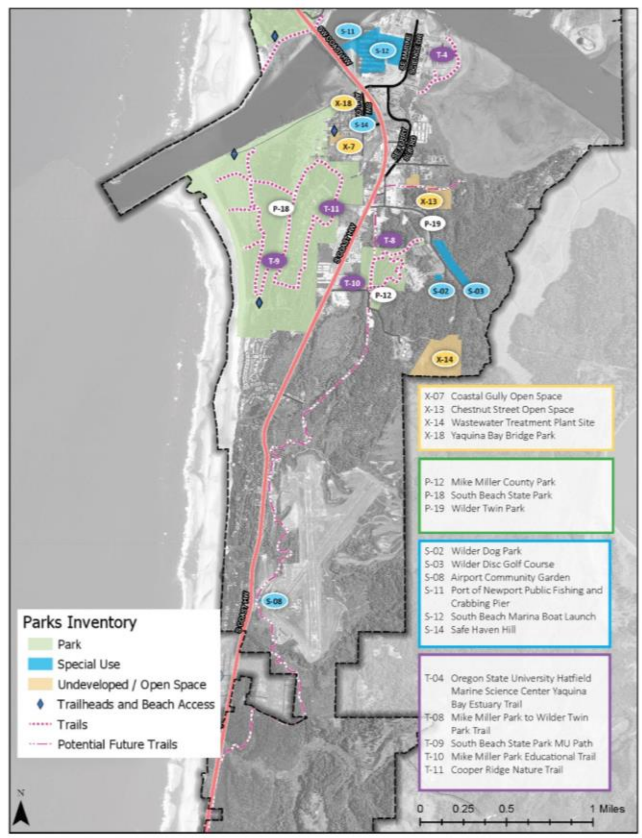
The Newport Pavement Management Program consists of an inventory of all publicly-maintained streets and their condition in order to evaluate the adequacy of projected revenues to meet the maintenance needs recommended for the City. The City of Newport is responsible for the maintenance of 52 centerline miles of pavement, and the report evaluates how funding scenarios ranging from $300k per year to $2 million per year will affect the overall condition of pavement in the City.

What this means for the Newport TSP Update: Pavement condition data from the pavement management plan will be utilized in the TSP update to help identify and prioritize transportation projects.

Draft Park System Master Plan (2019 Draft)

The City of Newport is in the process of updating its Park System Master Plan. The plan establishes goals and strategies for enhancing the community's parks and recreation facilities through investment and development over the next twenty years. The planning process included visioning and goal setting for the parks system, an inventory of existing assets, recommendations for improvements, a design standards toolkit, and improvement priorities for implementation of the plan. Access to parks and recreation facilities is a priority of the Draft Park System Master Plan. As noted in the plan, Newport has a large population of older individuals, and good sidewalk conditions and ADA improvements are important to allow access to the City's park facilities. The following image shows the current parks inventory in Newport.





What this means for the Newport TSP Update: Figures 19 and 20 of the draft plan show recommendations for future trail connections, some of which will likely utilize sidewalks or paths in the right-of-way. These trail connections will be evaluated as part of the TSP update for inclusion on the TSP project lists.

Lincoln County Transportation System Plan (2007)

The Lincoln County TSP, adopted in 2007, considers transportation issues and guides transportation policy choices and system development in areas outside of incorporated cities and for County facilities through the year 2027. The primary objective of the TSP is to identify the transportation system improvements needed to support a safe, adequate, and connected transportation system throughout Lincoln County. The Lincoln County TSP addresses transportation facilities that are generally outside of the UGBs of incorporated cities, including Newport. Although the County has jurisdiction within a UGB until lands are annexed to a city, planning for infrastructure development within a UGB is primarily the responsibility of cities in cooperation with the County.

County facilities in Newport include:

- NE Avery St.
- SE 35th St.
- NE Newport Heights Dr.
- SE 98th St.
- SE Benson Rd.
- SE Yaquinta Heights Dr.
- NE Valley Ridge Dr.

What this means for the Newport TSP Update: **Improvements on County facilities included in Lincoln County's TSP will be reflected in Newport's updated TSP. Any additional changes to County facilities recommended through the Newport TSP update process will be coordinated with the County and County goals will be considered in the development of Newport's transportation goals.**

Lincoln County Transit Development Plan (2018)

The Lincoln County Transit Development Plan (TDP) evaluates a program of service improvement alternatives and presents a series of options to pursue over the plan's 20-year horizon. The plan addresses transit throughout the county, including routes that serve the City of Newport. The plan recommends the following improvements:

- East County Route between Newport and Siletz: Schedule and stop changes within Newport

- Newport City Loop Route: Modification of the route and creation of a new route serving the most popular stops.
- Coast to Valley Route connecting Newport and Corvallis: Increase service frequency and/or lengthen service span.
- South County Route: Add spur to connect to Oregon Coast Community College

What this means for the Newport TSP Update: The potential routes and stops identified within the City of Newport will be included and evaluated as part of the updated TSP Transit element. Additionally, as described in Technical Memorandum #3 – Regulatory Review, implementation of the TSP may include additional code language related to development near transit stops or along transit routes. The Lincoln County TDP will inform that discussion. Augmenting and maintaining the transit system has been identified by City staff as a key issue for this TSP update.

APPENDIX C- TECHNICAL MEMORANDUM #3: REGULATORY REVIEW

MEMORANDUM

DATE: October 10, 2019

TO: Newport TSP Project Management Team

FROM: Andrew Parish, Kyra Haggart and Darci Rudzinski, APG

SUBJECT: Newport Transportation System Plan Update
Technical Memo 3 – Regulatory Review

The City of Newport is undertaking an update of the City of Newport Transportation System Plan (TSP) consistent with the requirements of Statewide Planning Goal 12 - Transportation. The Transportation Planning Rule (TPR), Oregon Administrative Rule 660 Division 12, implements Goal 12. The TPR defines the necessary elements of a local Transportation System Plan (TSP) and how Goal 12 should be implemented locally. The overall purpose of the TPR is to provide and encourage a safe, convenient, and economical transportation system. The Rule also implements provisions of other statewide planning goals related to transportation planning in order to plan and develop transportation facilities and services in close coordination with urban and rural development. The TPR directs jurisdictions to integrate comprehensive land use planning with transportation needs and to promote multi-modal systems that make it more convenient for people to walk, bicycle, use transit, and drive less. Newport's TSP must be consistent with the current TPR, which was amended most recently in December 2011.

The TPR requires cities to prepare local TSPs that are consistent with the Oregon Transportation Plan (OTP); Technical Memorandum #2 (Plan Review Summary) addresses the OTP and other background documents that will be referenced in updating the Newport TSP. This memorandum will focus on the extent to which the City's policy and development requirements meet the requirements of TPR.

Newport Comprehensive Plan

Pursuant to the TPR, cities are required to adopt a local TSP as part of their comprehensive plans. The 1999 Newport TSP and its 2008 and 2012 amendments were adopted as part of the Newport Comprehensive Plan's Public Facilities Chapter (Chapter 5).

Comprehensive Plan Goals and Objectives related to transportation are found within the adopted TSP, and are "intended to guide the decision makers and the development community in the administration of the TSP and the development of applicable implementing ordinances consistent with the TSP. This section is not intended to provide review criteria for specific projects or to function as a capital improvement plan."

The City's transportation policies will need to be reviewed and revised to be consistent with the goals and objectives of this TSP update and its ensuing recommendations.

What this means for the Newport TSP Update: The TSP update process will provide an opportunity to review and update the Comprehensive Plan transportation element and other transportation policies, to better represent current state and local practices and objectives. Potential policy changes may reflect issues that have been evolving since the TSP was last updated, such as strategies to optimize transportation management and maximizing the efficiency of the existing transportation system, integrating alternative transportation options, balancing modal capacity of facilities, and the role the transportation system plays in human health. Towards the end of the planning process, when solutions have been identified to satisfy future needs, policy statements will be developed to help implement TSP recommendations. Updated policy statements may augment or replace adopted comprehensive plan transportation policies and will help guide future actions, including land use decisions, after the TSP is adopted. The City will amend the comprehensive plan transportation policies in adherence to Goal 12 in the updated TSP document.

Newport Land Division and Development Regulations

The Newport Municipal Code contains Title XIII Land Division and Title XIV Zoning, which together control the process of land development within the City. The City's Land Division Ordinance and Zoning Ordinance include standards for land uses, dimensions of parcels and roadways, parking and access regulations, application procedures, and other important information relevant to creating and maintaining a functioning transportation system. The TPR requires that the City evaluate development applications for their effect on the transportation system, and that the City requires consistency with its TSP from developments.

What this means for the Newport TSP Update: The TSP update will revisit transportation standards, such as those related to street functional classifications, street cross-sections, and mobility and access management. Where modifications are proposed to these standards, the City development requirements will need to be updated for consistency with the updated TSP. In addition, the Land Division Ordinance contains a number of other transportation-related development requirements (e.g., vehicular and bicycle parking, pedestrian access). Amendments to these development requirements may be needed in order to implement the recommendations of the updated TSP and to better comply with the TPR.

Table 1 describes how City land division, zoning, and development requirements meet specific TPR requirements and identifies recommended improvements where local requirements could be strengthened or modified to be more consistent with the TPR. Suggested draft code language will be prepared at the implementation phase of the TSP update that supports the policies and recommendations of the draft TSP and ensures consistency with the TPR.

Table 1. TPR Requirements and Recommendations for the Newport Development Code

<table>
<tr><th>TPR Requirement</th><th>Municipal Code References and Recommendations</th></tr>
<tr><td colspan="2">OAR 660-012-0045 – Implementation of the Transportation System Plan</td></tr>
<tr><td colspan="2">(1) Each local government shall amend its land use regulations to implement the TSP.</td></tr>
<tr><td>(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use:
(A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals;
(B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards;
(C) Uses permitted outright under ORS 215.213(1)(m) through (p) and 215.283(1)(k) through (n), consistent with the provisions of 660-012-0065; and
(D) Changes in the frequency of transit, rail and airport services.
(b) To the extent, if any, that a transportation facility, service, or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment.</td><td>The Newport Zoning Ordinance includes transportation facilities as “Institutional and Civic Uses” – either “Basic Utilities or Roads” or “Utility, Road, and Transit Corridors.” (14.03.060.E Commercial and Industrial Districts – Institutional and Civic Use Categories). Basic Utilities and Roads are permitted in all commercial and industrial districts, and Utility, Road, and Transit Corridors are conditional uses.
Port facilities are permitted in the W-1 and W-2 zones.
Trails, paths, bike paths, walkways, etc. are permitted in Public (P-1, P2, and P-3) land use classifications.

Recommendation:
Consider consolidating transportation facilities from these various definitions and locations. This could be accomplished by adding "Transportation Facilities (operation, maintenance, preservation, and construction in accordance with the City’s Transportation System Plan)" as a permitted use in all land use districts.
Alternatively, add “Basic Utilities or Roads” as an allowed use in other zoning districts.</td></tr>
<tr><td>(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 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.</td><td>TPR Section -0050 addresses project development and implementation - how a transportation facility or improvement authorized in a TSP is designed and constructed. Project development may or may not require land use decision-making. The TPR directs that during project development, projects authorized in an acknowledged TSP will not be subject to further justification with regard to their need,</td></tr>
</table>

TPR Requirement	Municipal Code References and Recommendations
	mode, function, or general location. To this end, the TPR calls for consolidated review of land use decisions and proper noticing requirements for affected transportation facilities and service providers. The City allows for consolidated review of multiple land use or development permits under Development Code Section 14.52.130 – Consolidated Procedure, stating that "Any applicant for a land use action may apply at one time for all related land use actions." Chapter 14.45 – Traffic Impact Analysis states that a TIA shall be submitted "To determine whether a significant effect on the transportation system would result from a proposed amendment to the Newport Comprehensive Plan or to a land use regulation, as specified in OAR 660-012-0060," among other situations. **This TPR provision is met**
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities corridors and sites for their identified functions. Such regulations shall include:	
(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;	Chapter 14.14 addresses Parking, Loading, and Access Requirements, and requires spacing of driveway access onto Arterial streets of 500 feet, "where practical" (14.14.120.E). Access spacing standards for roadways and intersections are not provided. The Land Division Ordinance contains block regulations (13.05.020) limiting block size to 1,000 feet in length but does not describe access control measures. Chapter 14.44.050.E – Transportation Standards states that (the location, width, and grade of all streets shall conform to the

TPR Requirement	Municipal Code References and Recommendations
	Transportation System Plan, Subdivision plan, or street plan, as applicable…” **Recommendation:** Update Title 13 and/or Title 14 to include access control measures that are consistent with the functional classification system recommended by the TSP update. Whether spacing standards are ultimately located within the development code or are referenced in the TSP will be discussed in the implementation phase of this process.
(b) Standards to protect the future operations of roads, transitways and major transit corridors	Chapter 14.45 addresses Transportation Impact Analysis (TIA) regulations. A TIA is required in cases of amendments to the comprehensive plan or land use regulation, as specified in OAR 660-012-0060; as required by ODOT in conjunction with an approach road permit; when a proposal may generate 100 or greater PM peak-hour trips; when a proposal may increase adjacent street use by heavy vehicles by 10 trips a day or more; or when the proposal utilizes Trip Reserve Funds to meet the requirements of the South Beach Transportation Overlay Zone (Chapter 14.43). This TIA is intended to ensure that operations of transportation facilities is maintained through individual land use decisions. 14.45.070 provides a fee in lieu requirement for certain situations. **Recommendation:** This TPR provision is met. However, the TSP update provides an ideal opportunity to revisit the thresholds that trigger a TIA, as well as the process and requirements. Any recommended changes resulting from this

TPR Requirement	Municipal Code References and Recommendations
	review may necessitate updates to Chapter 14.45.
(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;	Chapter 14.22 – Airport Restricted Area establishes zones that regulate allowed height, electrical interference, noise, and other issues through standard airport-related imaginary surfaces. **This TPR provision is met.**
(d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;	See response to -0045(1)(c). **This TPR provision is met.**
(e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;	This section is implemented by section 14.45 (Traffic Impact Analysis), 14.34 (Conditional Uses), and 14.44 (Transportation Standards). Section 14.45 establishes the standards for when a proposal must be reviewed for potential traffic impacts, when a TIA must be submitted with a development application, the study area, and who is qualified to prepare the analysis. 14.45.060 states that "The city may deny, approve, or approve a development proposal with conditions needed to meet operations, structural, and safety standards and provide the necessary right-of-way and improvements to ensure consistency with the city's Transportation System Plan." **This TPR provision is met.** The provisions of these sections will be revisited to ensure compliance with the updated TSP.
(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of: *(A) Land use applications that require public hearings;* *(B) Subdivision and partition applications;*	Notice requirements are detailed in Section 14.52.060 and include "any affected public agency or public/private utility" in the list of those who shall receive notice.

TPR Requirement	Municipal Code References and Recommendations
(C)Other applications which affect private access to roads; and *(D)Other applications within airport noise corridor and imaginary surfaces which affect airport operations.*	Subdivision Ordinance notice requirements are in Section 13.05.075 Preliminary Review and Notice of Hearing and require that the Community Development Director provide notice to "other agencies known to be affected or to have an interest." **Recommendation:** Add specific language for Type III and Type IV applications requiring transportation providers, including ODOT, Lincoln County Transit, and the Newport Municipal Airport, be notified of proposals that may impact their facilities or services.
(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.	Section 14.45.050.C requires "where a proposed amendment to the Newport Comprehensive Plan or land use regulation would significantly affect an existing or planned transportation facility, the TIA must demonstrate that solutions have been developed that are consistent with the provisions of OAR 660- 012-0060." **This TPR provision is met.**
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below.	
(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.	Bicycle parking is addressed in Section 14.14.070. Bicycle parking facilities are required as part of new multifamily residential developments of 4 units or more, as well as new retail, office, and institutional developments. The amount of bicycle parking required depends on the number of required vehicle parking spaces. **Recommendation:** As appropriate, consider adding transit transfer stations and park-and-ride lots to the facilities which require bicycle parking. Also consider referencing the Lincoln County

TPR Requirement	Municipal Code References and Recommendations
	Transit Development Plan within the development code.
(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. *(A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers;* *(B) Bikeways shall be required along arterials and major collectors. sidewalks shall be required along arterials, collectors and most local streets in urban areas except that sidewalks are not required along controlled access roadways, such as freeways;* *(C) Cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes set forth in this section;* *(D) Local governments shall establish their own standards or criteria for providing streets and accessways consistent with the purposes of this section. Such measures may include but are not limited to: standards for spacing of streets or accessways; and standards for excessive out-of-direction travel;* *(E) Streets and accessways need not be required where one or more of the following conditions exist:* *(i) Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided;* *(ii) Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or*	**On-site circulation and connections**: Circulation diagrams are a required part of a Planned Development application (14.35.60.9.b), showing the movement of vehicles, goods, bicycles, and pedestrians within the planned development. However, requirements related to on-site circulation and connections to nearby activity centers for non-motorized modes of transportation are not addressed in the either the Zoning or the Land Division Ordinance. **Parking Lots**: Chapter 14.14 addresses parking, loading, and access requirements. Pedestrian and/or bicycle circulation through parking lots are not addressed. **Bikeways and sidewalks**: Street standards in the Land Division Ordinance (13.05.015) state that sidewalks are required. Cross-sections and other standards for roadways are not included or referenced in either Title 13 or Title 14. **Street and accessway layout**: Section 13.05.020 establishes block sizes for subdivisions. Block length is restricted to 1,000', and a pedestrian or bicycle way may be required if block length exceeds that figure. **Cul-de-sacs:** Cul-de-sacs may be required to include pedestrian accessways. They are also limited to a length of 400 feet (13.05.015.I). **<u>Recommendations:</u>** • Amend Title 13 and Title 14 to include language related to on-site circulation and connections, and

TPR Requirement	Municipal Code References and Recommendations
(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.	pedestrian access through parking lots. • Include references in Title 13 and Title 14 to adopted street standards in the updated TSP. Street standards will need to comply with the bikeway requirements within the TPR. • Evaluate the 1,000' block length and accessway requirements as part of the TSP update.
(c) Off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle and pedestrian travel, including bicycle ways on arterials and major collectors	Section 14.45.060 states that the City may condition development to "provide the necessary right-of-way and improvements to ensure consistency with the City's Transportation System Plan." **Recommendation:** Add specific language stating that the City may require off-site improvements proportionate to the impacts of proposed development and that conditioned improvements may include facilities accommodating convenient pedestrian and bicycle travel, consistent with the TSP. Proposed code modifications would suggest what type of findings are necessary to require such off-site improvements.
(d) For purposes of subsection (b) "safe and convenient" means bicycle and pedestrian routes, facilities and improvements which: *(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;* *(B) Provide a reasonably direct route of travel between destinations such as between a transit stop and a store; and*	Adopted City development requirements do not contain language requiring "safe and convenient" bicycle and pedestrian routes. **Recommendation:** Address TPR requirements related to bicycle and pedestrian access and mobility through the addition of a new Pedestrian Access and Circulation section in the Land Division Ordinance. Review the applicability of proposed new requirements for all future subdivisions.

TPR Requirement	Municipal Code References and Recommendations
(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.	
(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.	The City currently does not have requirements related to non-motorized circulation internal to office park and commercial development. **Recommendation:** See recommendation above.
(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 determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivisions as provided in (a)-(g) below.	
(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate	The City of Newport does not have a population greater than 25,000. However, the community is currently served by Lincoln County Transit and the updated TSP will address existing and future transit facilities and services. **Recommendation:** The TSP update planning process will identify transit routes and ensure that roadway design requirements will accommodate service on existing and planned routes. Depending on the draft TSP recommendations, update development requirements as necessary to address the provision of transit amenities. Additionally, add standards to subdivision regulations and infill development requirements (NMC 14.44) to require transit-supporting amenities consistent with the adopted Lincoln County Transit Development Plan.
(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.	Access to transit is not currently addressed by the TSP.

TPR Requirement	Municipal Code References and Recommendations
(A) Walkways shall be provided connecting building entrances and streets adjoining the site; *(B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable. Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways about the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property;* *(C) In addition to (A) and (B) above, on sites at major transit stops provide the following:* *(i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or 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 provide; and* *(v) Lighting at the transit stop.*	**Recommendation:** See response to -0045(4)(a).
(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.	The City can also meet the requirements of the TPR related to pedestrian connections to transit (TPR -0045(4)(b)(A) and (B)) by adopting appropriate implementing measures within a designated pedestrian district. The City of Newport currently does not have pedestrian district designations. **Recommendation:** For the approach offered by TPR -0045(4)(c), the City would need to consider designating pedestrian districts and developing specific code language to address, among other things, "major transit stops," as defined through the TSP update.
(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools	Chapter 14.14 addresses parking and loading generally. Employee parking areas and preferential parking for carpools and vanpools are not addressed.

TPR Requirement	Municipal Code References and Recommendations
	Recommendation: The City should consider requiring that new developments with planned designated employee parking areas provide preferential parking for employee carpools and vanpools. A typical local code requirement is requiring employers with more than a specific number of employees, or developments where required parking spaces exceed a specific number, to dedicate a percentage of the required parking spaces for car/vanpools.
(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.	The TSP update is expected to include a considerable update to the City's bicycle and pedestrian circulation plan, consistent with TPR -0020. This TPR requirement is currently implemented in City requirements as follows: • Walkways between cul-de-sacs and adjacent roads – See response and recommendations related to cul-de-sacs, Section -0045(3)(b). • Walkways between buildings – See response and recommendations related to accessways, Section -0045(3)(b). • Access between adjacent uses – See response and recommendations related to accessways, Section -0045(3)(b). **Recommendation:** This requirement will be addressed by the TSP update planning process and can be implemented locally by requiring improvements in developing areas consistent with adopted code provisions.
(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,	The Land Division Ordinance defers to the adopted TSP for roadway and right-of-way widths but sets the minimum standards in Section 13.05.015.B. Public improvement requirements for streets are listed in Section 13.05.040.A.1, where street widths are set at 36' (improved).

TPR Requirement	Municipal Code References and Recommendations
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.	This standard for a local street is wider than recommended widths illustrated in the Transportation Growth Management Neighborhood Street Design Guidelines (listed below). **<u>Recommendation:</u>** The TSP update process provides the City with the opportunity to evaluate local streets standards to determine if modifications need to be made to both meet the current and future needs of the community and implement this TPR requirement.
OAR 660-12-0060	
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.	TPR compliance is addressed in Section 14.45 Traffic Impact Analysis, which requires a "significant effect" determination for proposed amendments to the Newport Comprehensive Plan or land use regulations and, consistent with TPR -0060, that the proposed changes are consistent with the "identified function, capacity, and performance standards" of the impacted facility. **This TPR provision is met.**

APPENDIX D- TECHNICAL MEMORANDUM #4: GOALS, OBJECTIVES AND CRITERIA

DKS

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MEMORANDUM

DATE: October 10, 2019

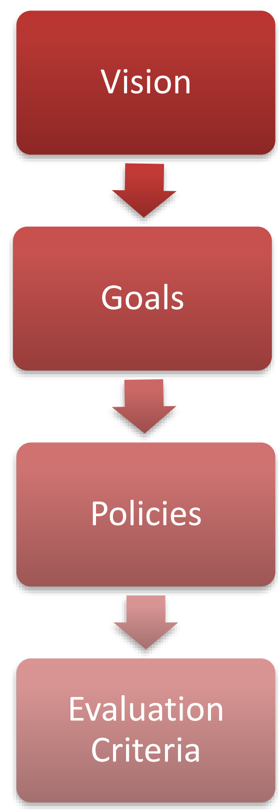
TO: Newport TSP Project Management Team

FROM: Carl Springer, DKS Associates
Kevin Chewuk, DKS Associates

SUBJECT: Newport Transportation System Plan Update
Technical Memo 4 – Goals and Objectives

The purpose of this memorandum is to initiate the process of developing the transportation-related vision, goals, policies, and evaluation criteria that will help guide the update of the Newport Transportation Plan (TSP) and future investment decisions. This effort will continue through the planning process, shaped by input received from the project team, Project Advisory Committee and the general public.

Setting Direction for Transportation Planning



Collectively, the transportation-related goals, policies, and evaluation criteria describe what the community wants the transportation system to do in the future, as summarized by a **vision statement**. A vision statement generally consists of an imaginative description of the desired condition in the future. It is important that the vision statement for transportation align with the community's core values.

Goals and policies create manageable stepping stones through which the broad vision statement can be achieved. **Goals** are the first step down from the broader vision. They are broad statements that should focus on outcomes, describing a desired end state. Goals should be challenging, but not unreasonable.

Each goal must be supported by more finite **policies**. In contrast to goals, policies should be specific and measurable. Where feasible, providing a targeted time period helps with policy prioritization and achievement. When developing policies, it is helpful to identify key issues or concerns that are related to the attainment of the goal.

The solutions recommended through the TSP must be consistent with the goals and policies. To accomplish this, measurable **evaluation criteria** that are based on the goals and objectives will be developed. For the Newport TSP, they will be used to inform the selection and prioritization of projects and policies for the plan by describing how well the alternatives considered support goal areas.

Developing Updated TSP Goals and Policies

The goals and policies from Newport's current TSP and Comprehensive Plan, as well as the strategies in the Greater Newport Area Vision 2040, provide a starting point for setting the direction for the new TSP. They cover a wide range of topics that could be applied to the TSP.

From that review, the project team developed an initial set of goals and objectives to provide a framework for the Newport TSP update. In contrast to the existing TSP structure that categorizes transportation policy by mode, the proposed goals and objectives describe a multi-modal, integrated approach to transportation planning. The new draft goals and objectives provided below will be shared with the Project Advisory Committee at their first meeting, and the general public, with further input sought to refine them. At this time, all goals and objectives are considered to be of equal importance.

After receiving input, the project team will create a revised set of goals and objectives and develop corresponding evaluation criteria. These will continue to evolve throughout the TSP update process.

Transportation Vision Statement

Travel to and through Newport is safe and efficient, with convenient options available for everyone. Investments in the transportation system are made in a cost-effective manner and respect the City's resources. The system supports local business activity, and all streets, including US 101 and US 20 complement a vibrant streetscape environment where people stop and visit and can travel by all modes safely and comfortably.

TSP Goals

Goal 1: Safety

Improve the safety of all users of the system for all modes of travel.

a) Reduce the frequency of crashes and strive to eliminate crashes resulting in serious injuries and fatalities.

b) Proactively improve areas where crash risk factors are present.

c) Improve the safety of east-west travel across US 101.

d) Improve the safety of north-south travel across US 20.

e) Apply a comprehensive approach to improving transportation safety that involves the five E's (engineering, education, enforcement, emergency medical services, and evaluation).

Goal 2: Mobility and Accessibility

Promote efficient travel that provides access to goods, services, and employment to meet the daily needs of all users, as well as to local and regional major activity centers.

a) Support expansions of the local and regional transit network and service.

b) Support improvements that enhance mobility of US 101 and US 20.

c) Manage congestion according to current mobility standards.

d) Support transportation options and ease of use for people of all ages and abilities.

e) Ensure safe, direct, and welcoming routes to provide access to schools, parks, and other activity centers for all members of the community, including visitors, children, people with disabilities, older adults, and people with limited means.

f) Provide an interconnected network of streets to allow for efficient travel.

Goal 3: Active Transportation

Complete safe, convenient and comfortable networks of facilities that make walking and biking an attractive choice by people of all ages and abilities.

a) Continuously improve existing transportation facilities to meet applicable City of Newport and Americans with Disabilities Act (ADA) standards.

b) Provide walking facilities that are physically separated from auto traffic on all arterials and collectors, and on streets and paths linking key destinations such as employment centers, schools, shopping, and transit routes.

c) Provide low-cost improvements to enhance walking and biking on all arterials and collectors, and on streets and paths linking key destinations such as employment centers, schools, shopping, and transit routes.

d) Provide safe street crossing opportunities on high-volume and/or high-speed streets.

e) Provide walking access to transit routes and major activity centers in the City.

f) Work to close gaps in the existing sidewalk network.

g) Provide biking facilities that are comfortable, convenient, safe and attractive for users of all ages and abilities on or near all arterials and collectors, and streets and paths linking key destinations such as employment centers, schools, shopping, and transit routes.

h) Provide biking access to transit routes, major activity centers in the City, and regional destinations and recreational routes.

Goal 4: Grow the Economy

Develop a transportation system that facilitates economic activity and draws business to the area.

a) Support improvements that make the City a safe and comfortable place to explore on foot.

b) Manage congestion along freight routes according to current mobility standards.

c) Provide safe, direct, and welcoming routes between major tourist destinations in Newport.

Goal 5: Environment

Minimize environmental impacts on natural resources and encourage lower-polluting transportation alternatives.

a) Support strategies that encourage a reduction in trips made by single-occupant vehicles.

b) Minimize negative impacts to natural resources and scenic areas, and restore or enhance, where feasible.

c) Support facility design and construction practices that have reduced impacts on the environment.

Goal 6: Support Healthy Living

Support options for exercise and healthy lifestyles to enhance the quality of life.

a) Develop a connected network of attractive walking and biking facilities, including off-street trails, which includes recreational routes as well as access to employment, schools, shopping, and transit routes.

b) Provide active transportation connections between neighborhoods and parks/open spaces.

c) Provide for multi-modal circulation on-site and externally to adjacent land uses and existing and planned multi-modal facilities.

Goal 7: Prepare for Change

Ensure that the choices being made today make sense at a time when Newport is growing, and the transportation industry is rapidly changing.

a) Anticipate the impacts and needs of connected and automated vehicles.

b) Seek to supplement traditional transportation options with more emphasis given to walking, biking, and transit and consideration for new alternatives such as car sharing, bike sharing, driverless vehicles, ride sourcing, and micro-mobility.

c) Explore opportunities to partner with state, regional, and private entities to provide innovative travel options.

Goal 8: Fiscal Responsibility

Sustain an economically viable transportation system.

a) Improve transportation system reliance to seismic and tsunami hazards, extreme weather events, and other natural hazards.

b) Identify and develop diverse and stable funding sources to implement transportation projects in a timely fashion and ensure sustained funding for transportation projects and maintenance.

c) Preserve and maintain existing transportation facilities to extend their useful life.

d) Seek to improve the efficiency of existing transportation facilities before adding capacity.

e) Ensure that development within Newport is consistent with, and contributes to, the City's planned transportation system.

Goal 9: Work with Regional Partners

Partner with other jurisdictions to plan and fund projects that better connect Newport with the region.

a) Coordinate projects, policy issues, and development actions with all affected government agencies in the area.

b) Build support with regional partners for the improvement of regional connections.

Supplemental Strategies

In addition to the goals and policies outlined above, a set of supplemental strategies and guidelines are shown below to address specific issues of concern within the Commercial Core and Agate Beach areas of the City. The strategies will be extensions of the citywide goals and policies to provide adequate depth and context for addressing the unique issues within these areas.

Commercial Core

- Consider improvements that enhance the safety of US 101 and US 20 and their intersections through the Commercial Core.
- Explore options for alternative highway routing through the Commercial Core.
- Consider options to meet the future capacity needs of the Yaquina Bay Bridge.
- Explore options for improved pedestrian and bicycle facilities across Yaquina Bay.
- Explore options for safe crossing opportunities of US 101 and US 20 in the Commercial Core.
- Consider streetscape improvements that define and enhance the character of the Commercial Core and serve as attractive gateways.
- Support the economic vitality of businesses in the Commercial Core by making multi-modal access safer, more convenient and more attractive.

Agate Beach

- Provide options for local street sections that consider the stormwater management needs of the Agate Beach area.
- Plan for local street connections adjacent to existing coastal routes given future erosion concerns.
- Evaluate safe crossing opportunities of US 101 in Agate Beach.
- Explore options to provide pedestrian and bicycle facilities on US 101 in Agate Beach.
- Explore options for a connection for pedestrians and bicyclists in Agate Beach to areas further south in the City.

APPENDIX E- TECHNICAL MEMORANDUM #5: EXISTING TRANSPORTATION CONDITIONS

MEMORANDUM

720 SW Washington St.
Suite 500
Portland, OR 97205
503.243.3500
www.dksassociates.com

DATE: September 2, 2020

TO: Newport TSP Project Management Team

FROM: Carl Springer, DKS
Kevin Chewuk, DKS
Rochelle Starrett, DKS

SUBJECT: Newport Transportation System Plan Update
Technical Memo 5 – Existing Conditions

This memorandum provides a summary of the existing transportation conditions in Newport. Included is a summary of how the existing transportation system is operating for pedestrians, bicyclists, transit riders, and motor vehicles. The analysis focuses on areas of Newport within the Urban Growth Boundary (UGB) and north of the Yaquina Bay Bridge, including detailed analysis for the pedestrian, bicycle, transit, and motor vehicle system. The following intersections were analyzed:

1. US 101/NE 73rd Street
2. US 101/NE 52nd Street/NW Lighthouse Drive
3. US 101/NW Oceanview Drive
4. US 101/NE 36th Street
5. US 101/NE 31st Street
6. US 101/NE 20th Street
7. US 101/NE 11th Street
8. US 101/NE 6th Street
9. US 101/US 20
10. US 101/SW Angle Street
11. US 101/SW Hurbert Street
12. US 101/SW Bayley Street
13. US 20/SE Benton Street
14. US 20/SE Moore Drive
15. NW Oceanview Drive/NW 25th Street
16. NW 11th Street/NW Nye Street
17. NE Harney Street/NE 7th Street
18. SW Hurbert Street/SW 9th Street
19. SW Abbey Street/SW 9th Street
20. SE Bay Boulevard/Se Moore Drive

The entire Newport UGB (including the area to the south of the Yaquina Bay Bridge) was analyzed as part of the 2012 Newport TSP update with a special emphasis on the South Beach area of Newport. That analysis will be reviewed and incorporated as appropriate as part of the current TSP update.

Methods

This section describes the methods used to complete each portion of the existing conditions analysis and is consistent with the Newport Methodology and Assumptions Memorandum.

Safety

Safety analysis is covered in Chapter 4 of the ODOT Analysis and Procedures Manual (APM)[1] and includes the following components and their corresponding data sources:

Study Intersections

Raw crash data was provided by ODOT from 2013 to 2017 (the five most-recent years of complete crash data) for the Newport UGB. This data was processed to identify crashes occurring at study intersections and used to calculate:

- Critical crash rates (APM Section 4.3.4)
- Excess proportion of crash types (APM Section 4.3.5)

Roadway Segments

ODOT publishes two data sets which summarize crash rates on state highway roadway segments which were used for this analysis:

- State highway crash rate tables[2]
- Safety Priority Index System (SPIS) sites (APM Section 4.3.1)[3]

The raw crash data provided by ODOT was also used to summarize crash trends throughout Newport over the five-year analysis period.

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[1] ODOT. *Analysis and Procedures Manual, V. 2, Ch. 4 Safety*. November, 2018.

[2] ODOT. *Crash Statistics & Reports.* https://www.oregon.gov/ODOT/Data/Pages/Crash.aspx. Accessed August 20, 2019.

[3] ODOT. *Safety Priority Index System Reports for On-State Highways.* https://www.oregon.gov/ODOT/Engineering/Pages/SPIS-Reports-On-State.aspx. Accessed August 20, 2019.

Level of Traffic Stress (LTS)

Multimodal analysis, including pedestrian and bicycle LTS, is covered in Chapter 14 of the APM[4]. Pedestrian and bicycle LTS evaluations provide a quantitative metric to understand a multimodal user's perception of the safety and comfort of the transportation network. This method can be used to understand key gaps and barriers to walking and bicycling which can then be addressed through targeted improvements. Segment analysis was completed for both pedestrians (APM Section 14.5.4) and bicyclists (APM Section 14.4.4) on all arterial and collector roadways within the Newport UGB. Intersection analysis was completed for all study intersections (Pedestrians, APM Section 14.5.9; Bicyclists, APM Section 14.4.5 and 14.4.6). The LTS evaluation generates a ranking between 1 and 4 of the relative safety and comfort of a segment or intersection for bicyclists or pedestrians based on roadway and intersection characteristics (*e.g.* number of lanes, travel speed and volume, intersection control, and the presence of any bicycle or pedestrian facilities). The LTS rating scale recognizes that as vehicle speeds and volumes increase, enhanced pedestrian and bicycle facilities are needed to maintain a system that is accessible for all users. ODOT uses the following definitions to define the LTS rankings[4]:

- Low Stress (LTS 1) – represents little traffic stress and requires less attention, so is suitable for all cyclists or pedestrians. Traffic speeds are low and there is no more than one lane in each direction. Intersections are easily crossed by children and adults. Typical locations include residential local streets, separated bike paths/cycle tracks, and sidewalks/shared use paths with a buffer between vehicles and cyclists or pedestrians.
- Moderate Stress (LTS 2) – represents little traffic stress, but requires more attention than young children would be expected to deal with, so is suitable for teen and adult cyclists or pedestrians with adequate bike handling skills. Traffic speeds are slightly higher but speed differentials are still low and roadways can be up to three lanes wide for both directions. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district. Sidewalks should generally be in good condition with limited impediments for mobility device users.
- High Stress (LTS 3) – represents moderate stress and is suitable for most observant adult cyclists or pedestrians. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions, and there can be limited buffers between travel lanes and the

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[4] ODOT. *Analysis and Procedures Manual, V. 2, Ch. 14 Multimodal Analysis*. November, 2018.

sidewalk. Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with bike lanes or moderate speed non-multilane roadways. Select segments of these roadways may be impassable to pedestrians who require a mobility device.

- Extreme Stress (LTS 4) – represents high stress and suitable for experienced and skilled cyclists or able-bodied adult pedestrians. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide for both directions with limited or no pedestrian facilities. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high-speed or multilane roadways with narrow or no bike lanes and sidewalks. Roadways without sidewalks are also included in this category.

Data for this analysis relied on project team field reviews and publicly available data sets, including:

- Google Maps
- Google Streetview
- ODOT TransGIS[5]

Results of the LTS evaluation were mapped and modified to match conditions within Newport. These modifications include:

Bicycle LTS

- Improve LTS on road segments with marked centerlines and one lane in each direction on collector streets with residential character consistent with streets with unmarked centerlines (Exhibit 14-5)
- Worsen LTS for signalized study intersections with offset legs (*e.g.* US 101/6th Street)

Pedestrian LTS

- Improve LTS on road segments with heavy on-street parking utilization (*e.g.* Bay Boulevard and Nye Beach) consistent for streets with buffers (Exhibit 14-17 and 14-18)

Intersection Operations

Traffic operations at study intersections were reported using Synchro 10 and Highway Capacity Manual (HCM) 6th Edition Methodology based on traffic counts collected July 11, 2019. Collecting traffic counts during July captures typical traffic conditions during the summer peak which

[5] ODOT. *TransGIS*. https://gis.odot.state.or.us/transgis/.

represents the 30th highest annual hour for traffic volumes (30 HV). Intersection geometry was collected using Google Maps/Streetview and field verified, if necessary.

Signalized intersection volume to capacity (v/c) ratios were post-processed at signalized intersections based on HCM 6th Edition Chapter 19[6] (APM Section 4). If HCM 6th Edition results could not be reported for signals, v/c ratios were reported using HCM 2000. Mainline through movement v/c ratios were post-processed at unsignalized intersections consistent with Chapter 12 of the APM[7] (APM Section 12.3.1).

Planning mobility targets for all study intersections on highway segments (*i.e.* US 101 and US 20) are outlined in Table 6 of the Oregon Highway Plan (OHP)[8] based on the highway classification, posted speed, and type of area. Newport does not have adopted mobility targets for study intersections on local streets; the OHP standards for district/local interest roads were applied at these locations instead. Mobility targets for each study intersection are summarized below in Table 4.

Existing Transportation Conditions

Safety

Crash Trends

930 crashes, seen in Figure 1, occurred within Newport over the five-year analysis period (2013-2017). There were on average 186 crashes each year, including:

- 322 rear-end crashes (35% of crashes)
- 234 turning movement crashes (25% of crashes)
- 31 pedestrian crashes (3% of crashes)
- 14 bicycle crashes (2% of crashes)

Crashes within Newport were generally not severe; over the analysis period:

- 3 crashes resulted in fatalities
- 20 crashes resulted in serious injuries (Injury A)

[6] Transportation Research Board. *Highway Capacity Manual, 6th Ed., Ch. 19 Signalized Intersections.* 2016.

[7] ODOT. *Analysis and Procedures Manual, V. 2, Ch. 12 Unsignalized Intersection Analysis*. July, 2018.

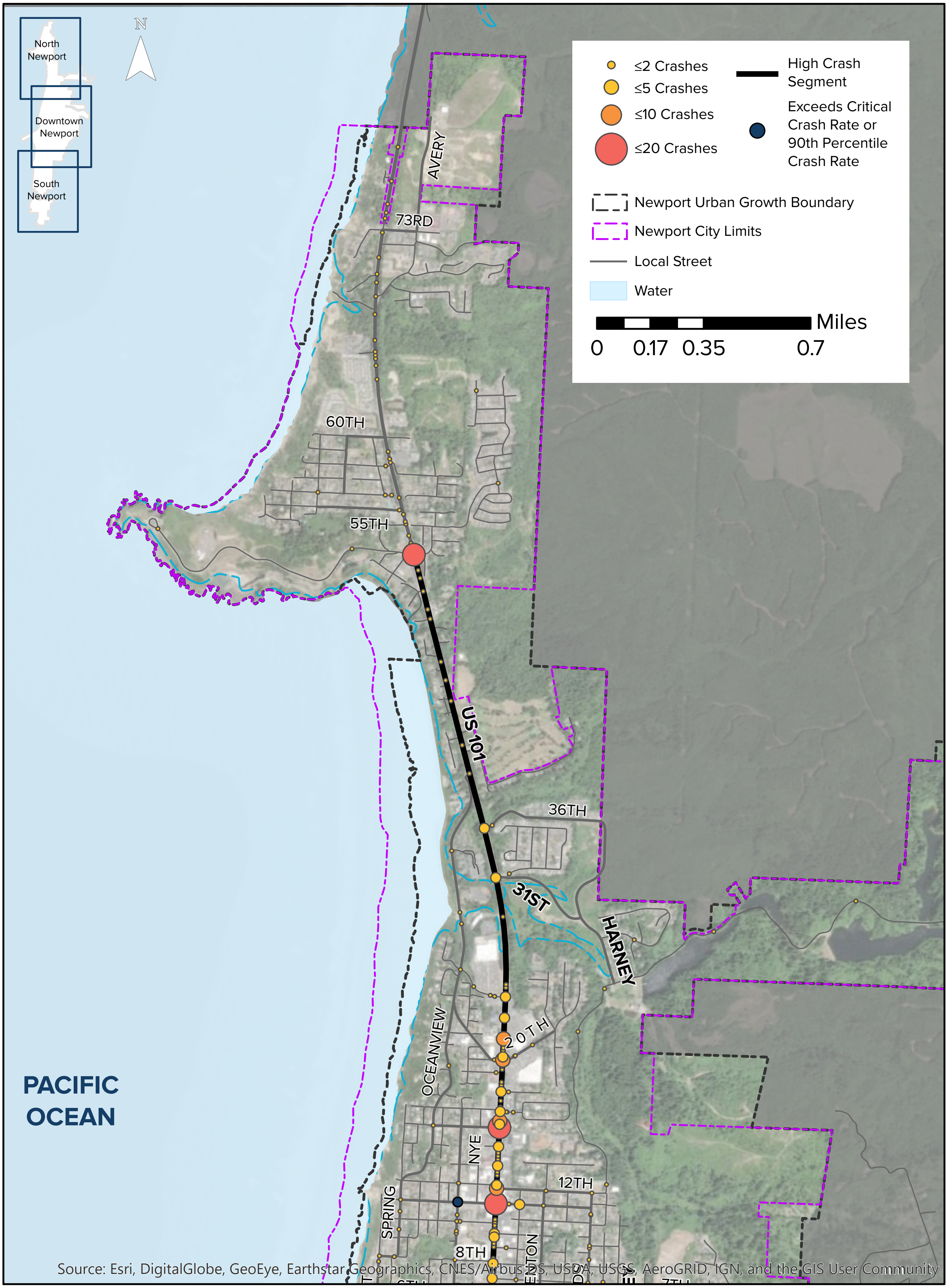
[8] ODOT. *Oregon Highway Plan, Table 6.* August, 2005.

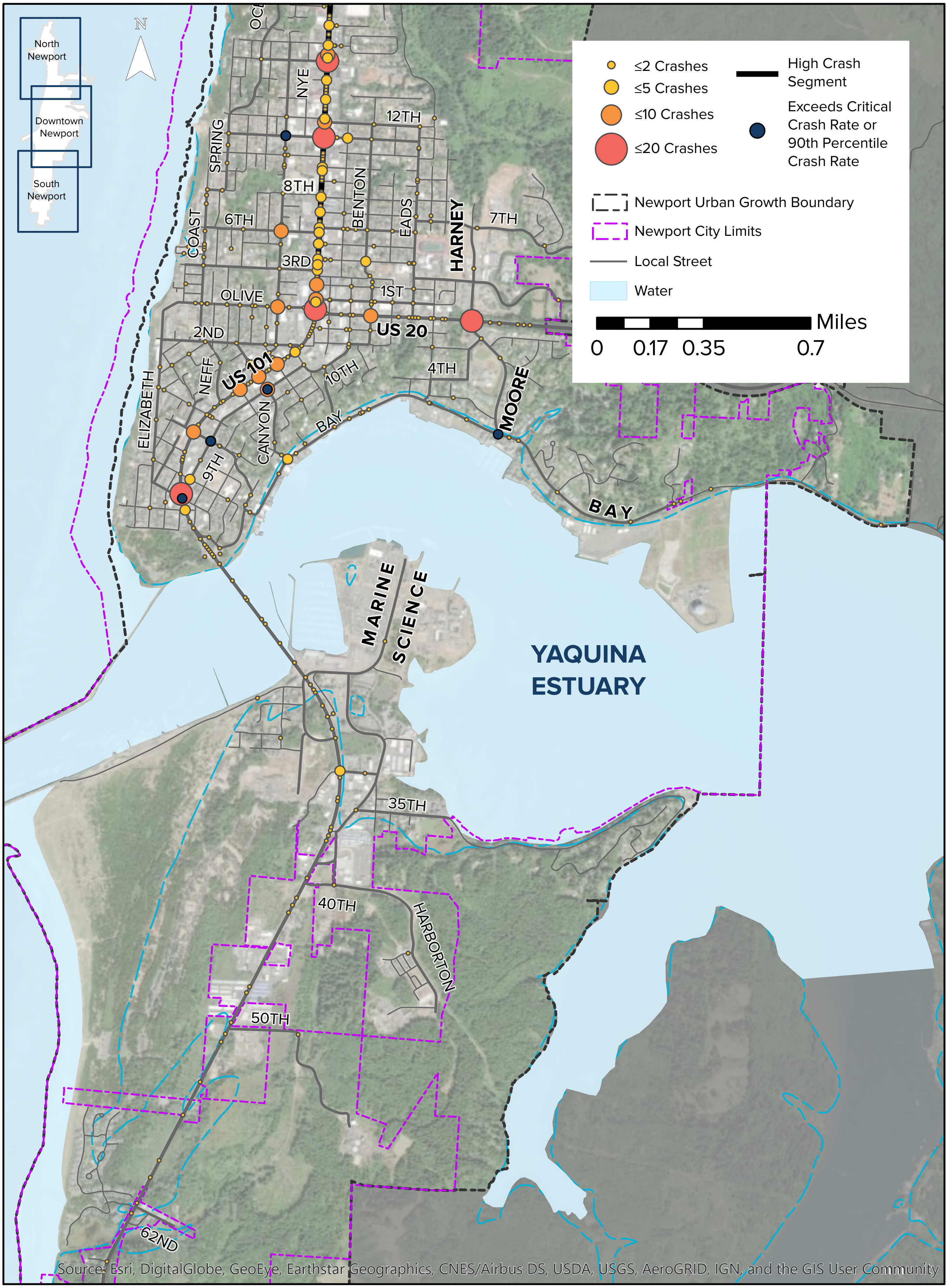
- 85% of crashes resulted in property damage only or lead to minor injuries (Injury C)

The five most common driver errors are responsible for nearly 65 percent of all crashes in Newport, including:

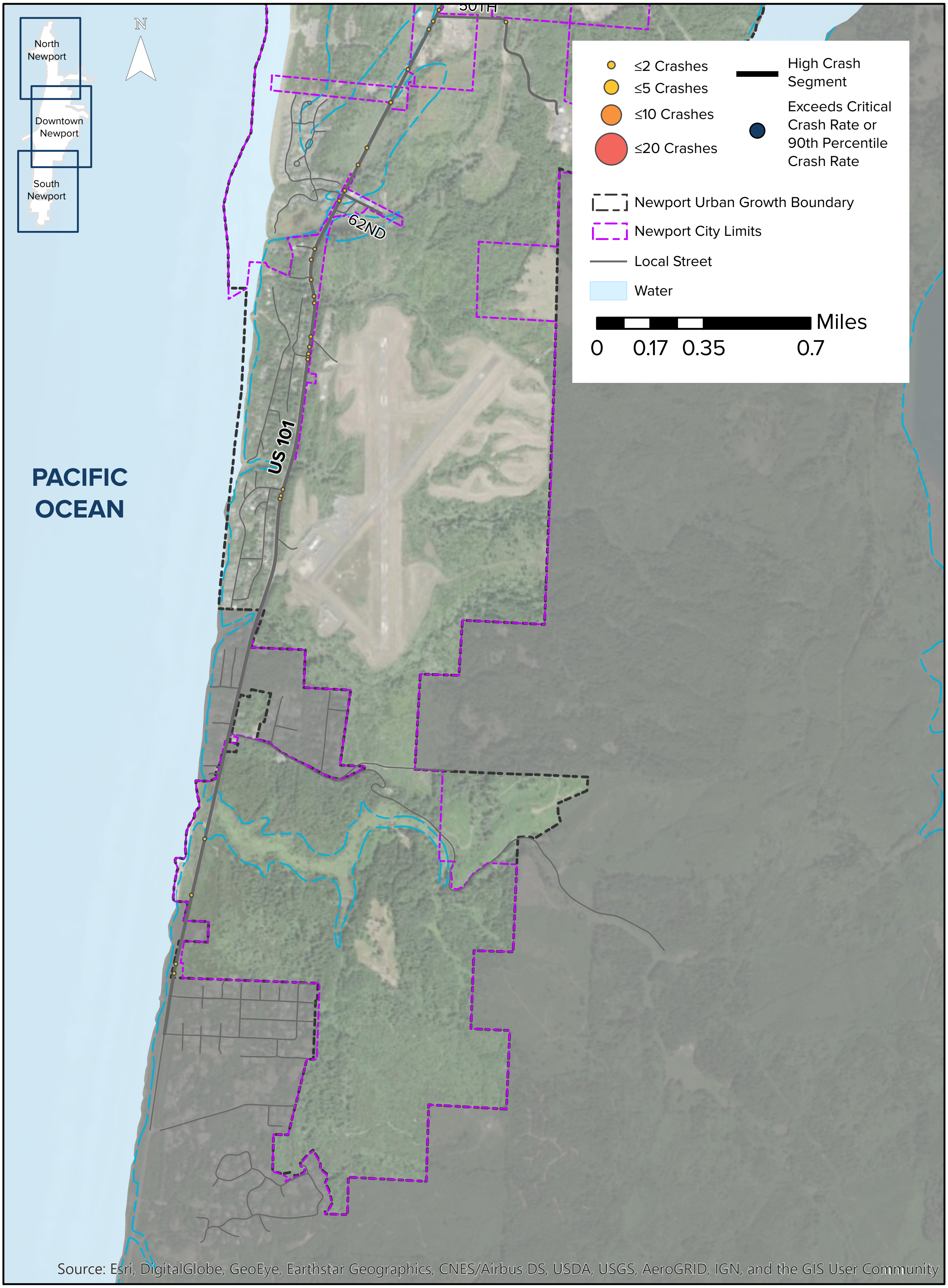
- Did Not Yield Right-of-Way (28 percent)
- Followed Too Closely (14 percent)
- Other Improper Driving (9 percent)
- Inattention (6 percent)
- Failed to Avoid Vehicle Ahead (6 percent)

Risky behavior, including alcohol/drug use or speeding was implicated in 41 and 39 crashes, respectively. These crashes tend to be more severe; alcohol/drug use and speeding is involved in 17% and 9% of high-severity crashes, respectively, despite being a factor in only 4% of crashes.


North Newport
Downtown Newport
South Newport
N
≤2 Crashes
≤5 Crashes
≤10 Crashes
≤20 Crashes
High Crash Segment
Exceeds Critical Crash Rate or 90th Percentile Crash Rate
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0
0.17
0.35
0.7
AVERY
73RD
60TH
55TH
US 101
36TH
31ST
HARNEY
20TH
OCEANVIEW
NYE
12TH
SPRING
8TH
PACIFIC OCEAN
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



North Newport
Downtown Newport
South Newport
N
≤2 Crashes
≤5 Crashes
≤10 Crashes
≤20 Crashes
High Crash Segment
Exceeds Critical Crash Rate or 90th Percentile Crash Rate
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
0 0.17 0.35 0.7 Miles
YAQUINA ESTUARY
NYE
12TH
SPRING
8TH
BENTON
EADS
HARNEY
7TH
6TH
COAST
3RD
1ST
OLIVE
2ND
US 20
US 101
NEFF
10TH
4TH
ELIZABETH
CANYON
BAY
MOORE
9TH
BAY
MARINE SCIENCE
35TH
40TH
HARBORTON
50TH
62ND
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



North Newport
Downtown Newport
South Newport
N
50TH
62ND
US 101
PACIFIC OCEAN
≤2 Crashes
≤5 Crashes
≤10 Crashes
≤20 Crashes
High Crash Segment
Exceeds Critical Crash Rate or 90th Percentile Crash Rate
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0
0.17
0.35
0.7
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Pedestrian Safety

31 pedestrian crashes occurred over the analysis period. Crashes involving pedestrians were most common in areas with higher levels of pedestrian activity, including downtown Newport (14 crashes) and at the Bay Boulevard/Fall Street intersection (two crashes).

One pedestrian fatality occurred during the analysis period near the intersection of US 101 and Ferry Slip Road. Pedestrians sustained severe injuries in seven crashes at the following intersections, and moderate injuries were sustained in 10 additional crashes at the following locations:

- US 101/N 11th Street
- US 101/N 1st Street
- US 101/Bayley Street
- Benton Street/N 4th Street
- Nye Street/N 6th Street
- Surf Street/S 4th Street
- Fall Street/Bay Boulevard

The majority of pedestrian-involved crashes (52 percent) were caused by drivers failing to yield the right of way; about 10 percent of the crashes were caused by a pedestrian illegally in the roadway. Over two-thirds (68%) of pedestrian-involved crashes occurred during the day or at night in a location with street lighting.

Bicycle Safety

14 bicyclist crashes occurred over the analysis period, primarily at intersections along US 101 like the US 101/NE 3rd Street intersection (three crashes) or US 101/NE 11th Street intersection (two crashes). A cyclist sustained severe injuries in one of the crashes, while moderate injuries were sustained in nine of the crashes.

Most of the crashes involving a bicyclist were caused by drivers failing to yield the right of way when turning or crossing (64 percent). The remaining crashes were caused by either a bicycle or motorist failing to obey traffic control devices. All reported bicycle crashes occurred during the day.

Intersection Safety

55% of crashes occur at intersections with Newport. Crash rates describe the annual number of crashes relative to the total traffic entering the intersection and can be used to flag intersections with safety deficiencies by comparing to other similar locations (*i.e.* the same control type and number of legs). ODOT uses both the critical crash rate and the statewide 90th percentile crash rate to flag safety deficiencies. The critical crash rate is calculated for each intersection type based on the average crash rate for study intersections and the selected statistical significance (typically 95th percentile). ODOT also maintains statewide critical crash rates and 90th percentile crash rates for each intersection type. Both the critical crash rate and the 90th percentile crash rates are used to flag intersections whose observed crash rate significantly exceeds the average crash rate of similar intersections in either the study or Oregon. There were four intersections with crash rates that exceeded either the critical crash rate or 90th percentile crash rate as shown in Table 1. Additionally, nine other intersections, also shown in Table 1, experienced an excess proportion of a specific crash type. The crash rates for all study intersections are provided in the appendix.

Table 1: Intersections with High Crash Rates

#	Location	Total Collisions (2013 to 2017)	Observed Crash Rate (per MEV)	Critical Crash Rate (per MEV)	Over Critical Crash Rate	90th Percentile Crash Rate (per MEV)	Over 90th Percentile Rate	Excess Proportion Crash Types**
2	US 101/52nd Street	15	0.46	0.64	No	0.86	No	Rear-End
7	US 101/11th	15	0.31	0.60	No	0.86	No	Bike
8	US 101/6th	15	0.31	0.60	No	0.86	No	Rear-End
12	US 101/Bayley	14	0.37	0.33	**Yes**	0.41	No	--
16	11th/Nye	5	0.96	0.62	**Yes**	0.41	**Yes**	--
18	Hurbert/9th	7	0.92	0.53	**Yes**	0.41	**Yes**	--
19	Abbey/9th	3	0.45	0.56	No	0.41	**Yes**	--
20	Bay/Moore	4	0.46	0.39	**Yes**	0.29	**Yes**	--

Per MEV = Crashes per million entering vehicles

** Parameters used: 90% minimum probability, 10% minimum excess proportion. Full results in appendix.

Each intersection with a high crash rate or an excess proportion of crash types is discussed below.

- **US 101/52nd Street (signal):** This four-leg signalized intersection experienced 15 collisions over the five years, including 11 rear-end crashes. Rear-end crashes at this site were typically caused by a driver following too closely or failing to avoid the vehicle ahead. Most crashes at this site led to injuries (11 of 15).

- **US 101/11th Street (signal):** This is a four-leg signalized intersection; seven crashes occurred here over the five years. Two of the seven crashes involved bicyclists, caused by a driver failing to yield or disregarding the traffic signal. Both crashes led to an injury to the cyclist.
- **US 101/6th Street (signal):** This is four-leg signalized intersection with offset intersection legs for 6th Street. Two-thirds (10 of 15) of the crashes were rear-ends, primarily caused by a driver following too closely or inattention. Most of the crashes involved property damage only (9 of 15).
- **US 101/Bayley Street (Two-Way Stop Control, or TWSC):** This is a four-leg intersection with stop control on Bayley Street. A Rectangular Rapid Flashing Beacon (RRFB) is located immediately north of the intersection, along US 101, and the 9th Street/US 101 intersection is also located in close proximity which could contribute to a higher crash rate at this location. One pedestrian crash also occurred at this site over the five years caused by careless driving. Over half of the crashes resulted in injuries (10 of 14).
- **11th Street/Nye Street (TWSC):** This is a four-leg intersection with stop control on Nye Street where five crashes occurred over the five years. Both the critical crash rate and 90th percentile crash rate are exceeded at this site, in part due to the relatively low entering volume among study intersections on local streets. All crashes at this site were angle crashes and were caused by a driver failing to yield or drivers who passed the stop sign. All five crashes resulted in property damage only.
- **Hurbert Street/9th Street (TWSC):** This is a four-leg intersection with stop control on 9th Street. The critical crash rate and 90th percentile crash rate are both exceeded at this site, likely due to the comparatively low entering volume. Additionally, this site experienced a high number of angle crashes (6 of 7) which were caused by failure to yield or vehicles passing the stop sign. Over half of the crashes (5 of 7) resulted in injuries.
- **Abbey Street/9th Street (TWSC):** This is a four-leg intersection with stop control on 9th Street. While the observed intersection crash rate is lower than the critical crash rate, this site exceeds the statewide 90th percentile crash rate. Over the past five years, all three crashes at this site were angle crashes caused by either passing the stop sign or failure to yield. Two of the crashes led to injuries and one crash resulted in property damage only.
- **Bay Boulevard/Moore Drive (TWSC):** This three-leg skewed intersection with stop control on the west leg (Bay Boulevard) had four crashes over the five years. Both the critical crash rate and 90th percentile crash rates are exceeded at this site. Half of the crashes involved

turning movements, caused by either failure to yield or passing the stop sign which could be exacerbated due to the sites' geometry. This intersection was realigned to reduce some of the intersection skew between August, 2016, and July, 2019; the impacts of this geometric change cannot be assessed from the available data. Half of the crashes resulted in property damage only (2 of 4).

Segment Safety

One state highway segment was identified as having a high crash rate which exceeded the statewide average crash rate for similar roadways, as shown in Table 2. The appendix includes additional details, including analysis results for all segments.

Table 2: Highway Segment with High Crash Rates

Highway (limits)	Distance (miles)	Total Collisions (2013 to 2017)	Observed Crash Rate (per MVMT)	Statewide Collison Rate (per MVMT)	Over Statewide Collison Rate
US 101- N 52nd Street/Lighthouse Drive to US 20	2.75	305	3.21	3.00	**Yes**

Per MVMT = Crashes per million vehicle miles traveled

US 101 – N 52nd Street/Lighthouse Drive to US 20 is a three- to five-lane two-way roadway segment which comprises the main north-south corridor in Newport. Crash causes on this segment reflect the dense urban land uses and are primarily categorized as failure to yield, following too closely, and failing to avoid the vehicle ahead. Most crashes (59 percent) occurred at intersections. There were five pedestrian-involved collisions and eight bicycle-involved collisions along this segment.

Additionally, according to the ODOT 2017 SPIS report (data reported between 2014 and 2016), and 2016 SPIS report (data reported between 2013 and 2015), several locations in Newport rank among the top most hazardous sections of highways in Oregon. The identified locations are listed below.

- US 101 around the N 20th Street intersection (top 10 percent segment, 2017; top 10 percent segment, 2016)
- US 101 around the N 16th Street intersection (top 10 percent segment, 2017)
- US 101 around the N 3rd Street intersection (top 10 percent segment, 2016)
- US 101 around the N 2nd Street intersection (top 10 percent segment, 2017)

- US 101 around the N 1st Street intersection (top 5 percent segment, 2017)
- US 101 around the SW Lee Street intersection (top 10 percent segment, 2016)
- US 101 around the SW Hurbert Street intersection (top 10 percent segment, 2016)
- US 101 around the SW Bayley Street intersection (top 5 percent segment, 2017)
- US 101 around the SW Bay Street intersection (top 5 percent segment, 2016)

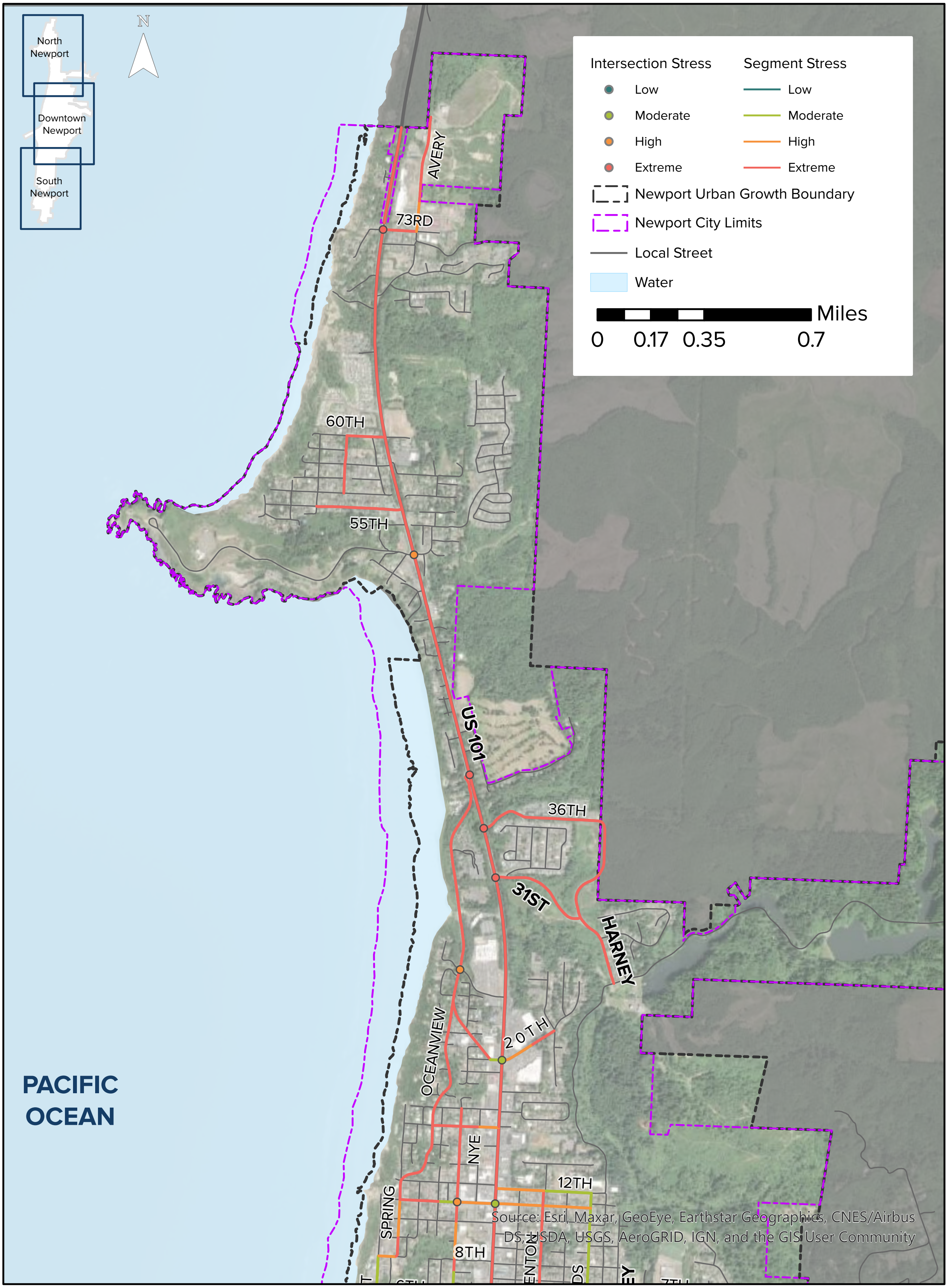
Pedestrian LTS

Pedestrians in Newport currently face a variety of sidewalk conditions throughout the City. When sidewalks are provided along an arterial or collector roadway in Newport, it is typically designated with moderate or high stress (LTS 2 or 3) which is suitable for most teenagers and adults. Only a few roadways in Newport operate with low stress (LTS 1) which is suitable for users of all ages and abilities. The existing pedestrian LTS is summarized in Figure 2. The following factors contribute to different LTS levels in the City:

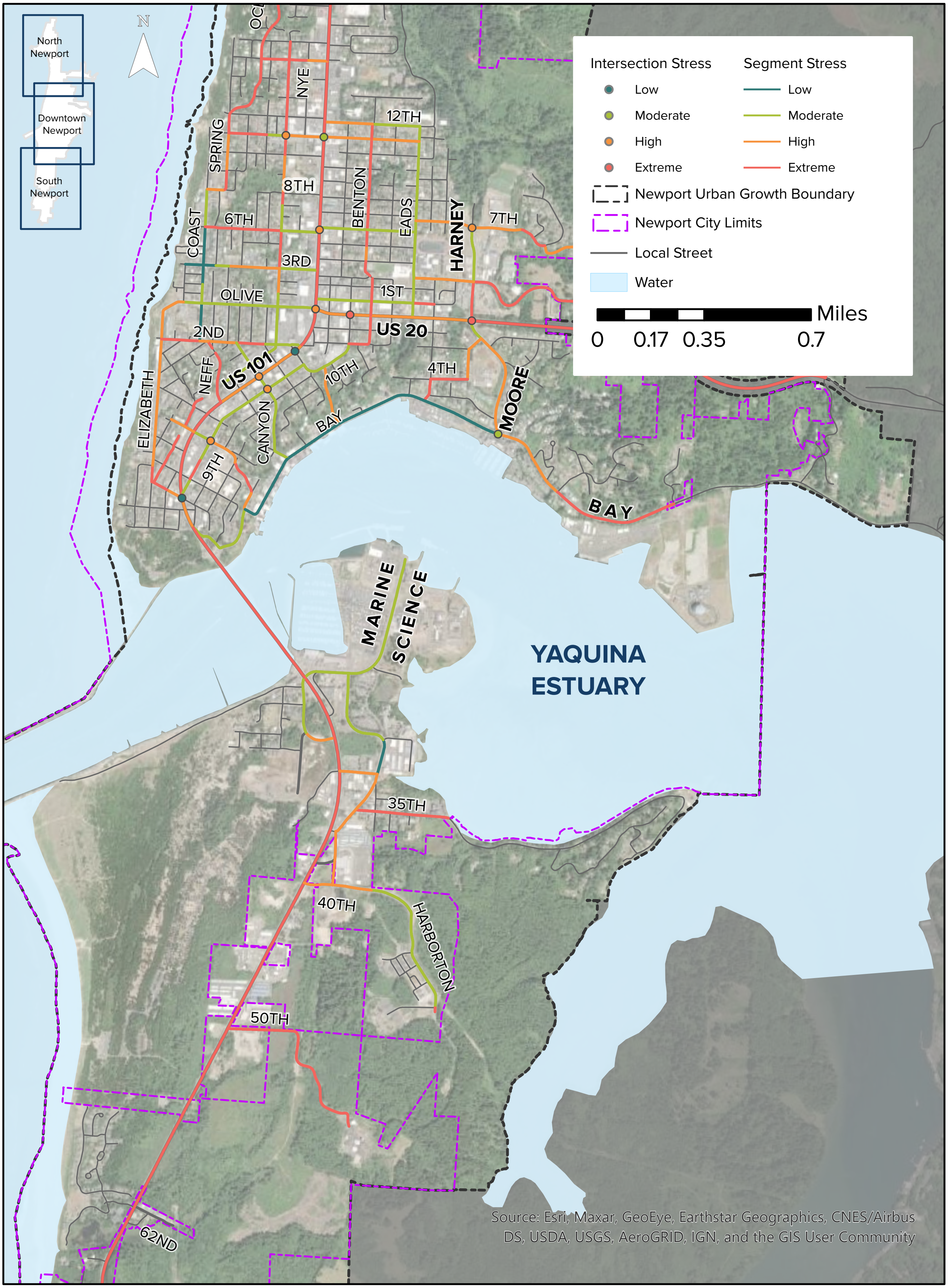
- Presence of buffers: buffers provide greater physical separation between pedestrians and vehicles creating a more comfortable environment for pedestrians. Many streets within Newport only have curb-tight sidewalks or a narrow landscape buffer which restricts these segments to moderate stress (LTS 2) or higher stress, except in pedestrian oriented districts (*i.e.* Agate Beach or Bay Boulevard) where wider sidewalks or other street furnishings create provide additional separation from vehicles for pedestrians
- Lack of sidewalks: older or more rural streets within Newport often lack sidewalks which restricts these segments to extreme stress (LTS 4) which is only suitable for able-bodied adults. In the event sidewalks are provided on at least one side of the street, these segments generally achieved high stress ratings (LTS 3)

Intersections, both signalized and unsignalized, also pose many challenges for pedestrians; the majority of study intersections operate at high or extreme stress (LTS 3 or 4). Key factors that degrade the LTS at intersections include:

- Lack of ADA compliant curb ramps: only six study intersections have curb ramps that meet ADA standards for all intersection legs
- Complex elements at signals, including: permissive right turns, channelized right turns, offset intersection legs, or crosswalk closures
- Limited medians on high-speed, high-volume routes to create pedestrian refuges or provide other enhancements (*e.g.* rectangular rapid flashing beacons or RRFBs)



North Newport
Downtown Newport
South Newport
N
Intersection Stress
Low
Moderate
High
Extreme
Segment Stress
Low
Moderate
High
Extreme
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0
0.17
0.35
0.7
AVERY
73RD
60TH
55TH
US 101
36TH
31ST
HARNEY
20TH
OCEANVIEW
NYE
12TH
SPRING
8TH
PACIFIC OCEAN
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


North Newport
Downtown Newport
South Newport
N
Intersection Stress
Low
Moderate
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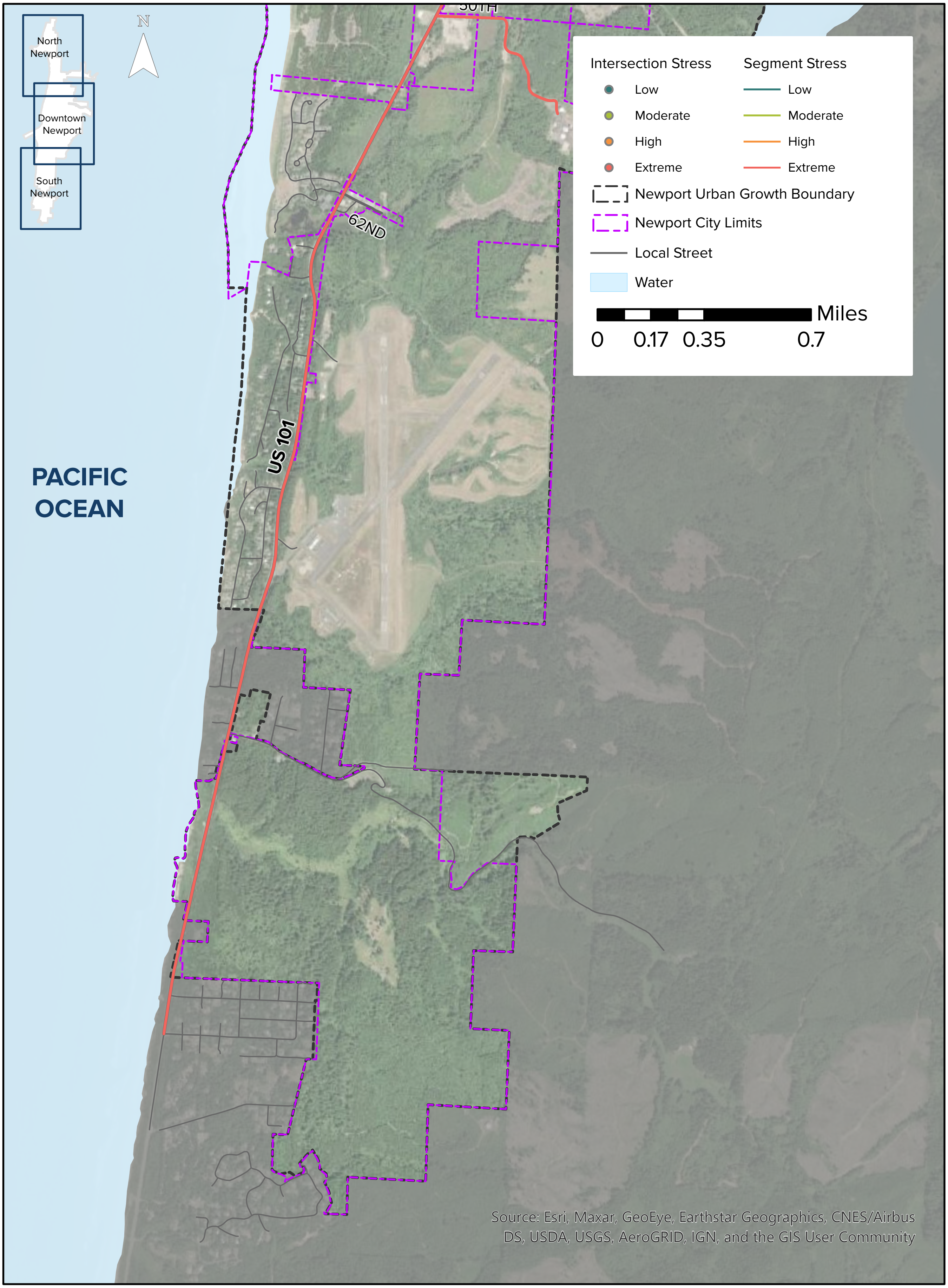
Extreme
Segment Stress
Low
Moderate
High
Extreme
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0
0.17
0.35
0.7
NYE
12TH
SPRING
8TH
BENTON
EADS
HARNEY
7TH
6TH
COAST
3RD
1ST
OLIVE
US 20
2ND
US 101
NEFF
10TH
4TH
MOORE
ELIZABETH
CANYON
BAY
9TH
BAY
MARINE SCIENCE
YAQUINA ESTUARY
35TH
40TH
HARBORTON
50TH
62ND
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


North Newport
Downtown Newport
South Newport
N
50TH
62ND
US 101
PACIFIC OCEAN
Intersection Stress
Low
Moderate
High
Extreme
Segment Stress
Low
Moderate
High
Extreme
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0
0.17
0.35
0.7
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Bicycle LTS

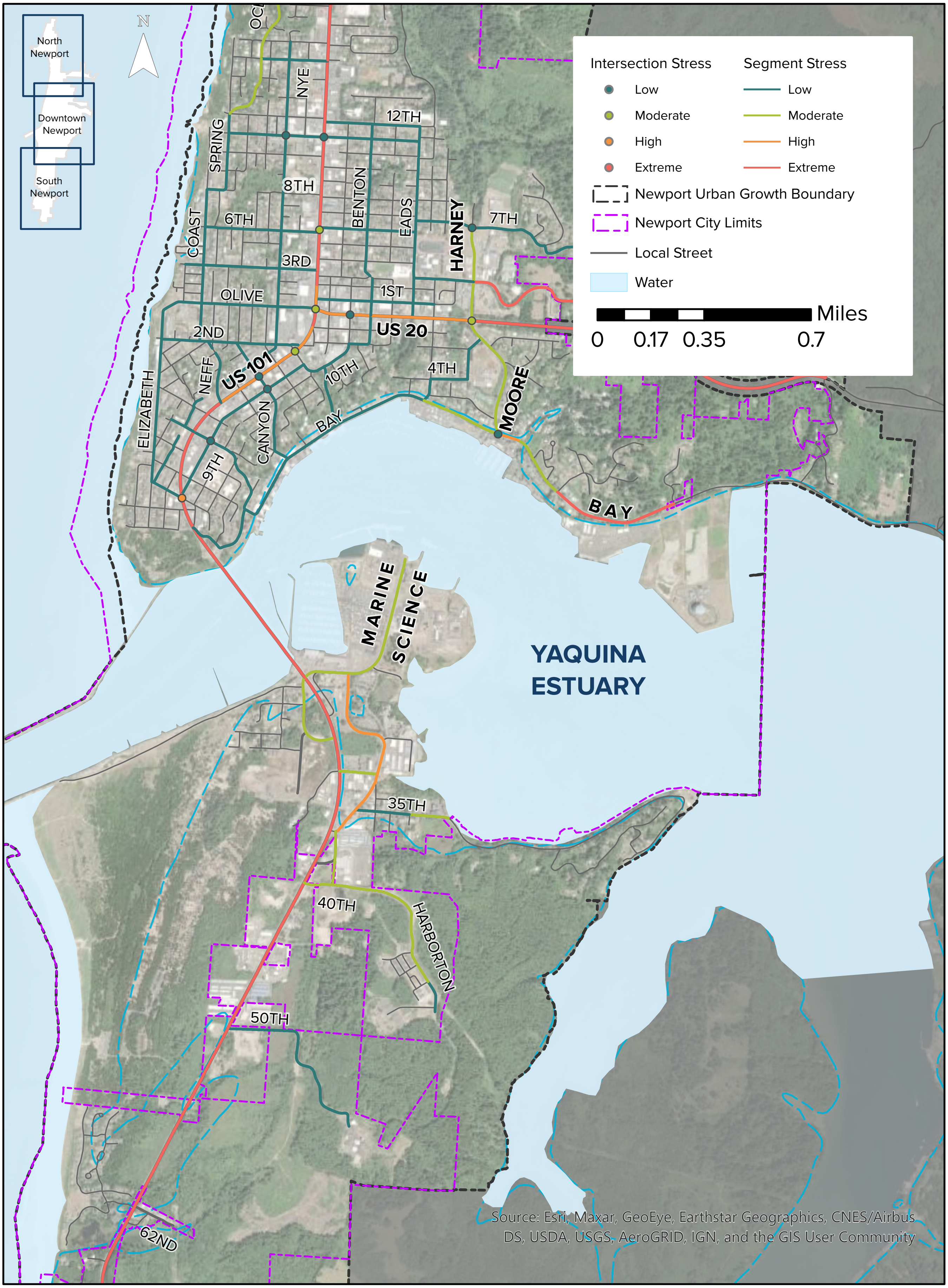
The Level of Traffic Stress (LTS) for bicyclists is generally good in Newport although major barriers to connectivity do exist (see Figure 3). Most collector streets in Newport have characteristics similar to local streets (*e.g.* 25 mph speeds, two lanes, shared roadway environments) and operate at low stress (LTS 1) which is suitable for cyclists of all ages and abilities. The LTS tends to increase on collector or arterial roadways away from Newport's downtown core, driven by a higher speed (30 mph or greater), shared roadway environment. The LTS is highest on US 101 and US 20 for Newport which creates a major barrier for the bicycle network connectivity, particularly north of Oceanview Drive and across the Yaquina Bay Bridge. Most segments of US 101 and US 20 within Newport are extreme stress (LTS 4) which is only suitable for experienced and confident cyclists, and even within the downtown core, US 101 and US 20 have a high bicycle stress (LTS 3), deterring many cyclists from riding on these facilities. Key findings for the segment bicycle LTS include:

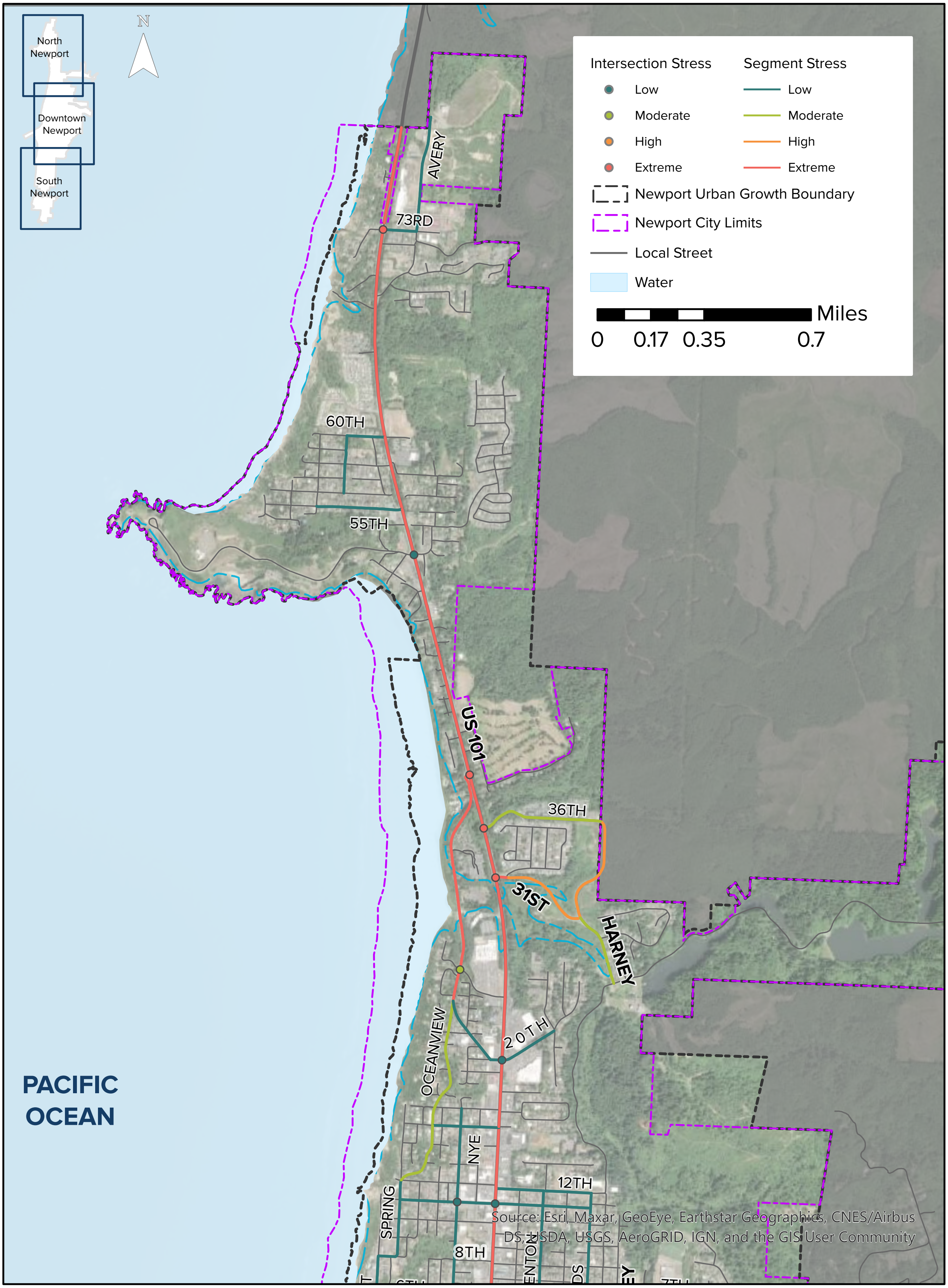
- Most collectors in Newport's downtown core operate at low stress (LTS 1) due to a low-speed, shared roadway environment
- Adding bicycle facilities on collectors or minor arterials with higher speeds (*e.g.* Oceanview Drive north of 12th Street) could reduce the LTS, although many of these roadways in Newport have a constrained roadway width and tend to be more rural in character
- US 101 and US 20 have a high or extreme LTS (3 or 4) due to their lack of bicycle facilities; even in locations with existing on-street bike lanes (*i.e.* near the US 101/NE 52nd Street/NW Lighthouse Drive intersection), the bicycle LTS remains high due to high operating speeds for vehicles
- Due to Newport's topography, US 101 is the primary north-south route and provides the only connection for vehicles or bicyclists in certain locations (*e.g.* Yaquina Bay Bridge) creating a significant barrier for bicyclists

Signalized intersections generally provide the best opportunities for cyclists to cross US 101 or US 20, and most signalized study intersections along these corridors operate at low or moderate stress (LTS 1 or 2). Signalized study intersections with a lower LTS generally had one of the following characteristics which create a more challenging environment for cyclists to navigate:

- A three-lane approach (US 101/US 20)
- Offset intersection legs (US 101/N 6th Street)
- Potential sight distance limitation (US 20/Harney Street/Moore Drive)

Most unsignalized study intersections along US 101 had a high or extreme LTS (either 3 or 4) which is driven by the speed and the wide cross section for US 101. Conversely, unsignalized study intersections on local streets primarily had a low stress ranking (LTS 1) driven by their low speed and narrow cross section.


North Newport
Downtown Newport
South Newport
N
Intersection Stress
Low
Moderate
High
Extreme
Segment Stress
Low
Moderate
High
Extreme
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
0
0.17
0.35
0.7
Miles
12TH
NYE
SPRING
8TH
BENTON
EADS
HARNEY
7TH
6TH
COAST
3RD
OLIVE
1ST
2ND
US 20
US 101
NEFF
10TH
4TH
MOORE
ELIZABETH
CANYON
BAY
9TH
BAY
MARINE
SCIENCE
YAQUINA
ESTUARY
35TH
40TH
HARBORTON
50TH
62ND
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



North Newport
Downtown Newport
South Newport
N
Intersection Stress
Low
Moderate
High
Extreme
Segment Stress
Low
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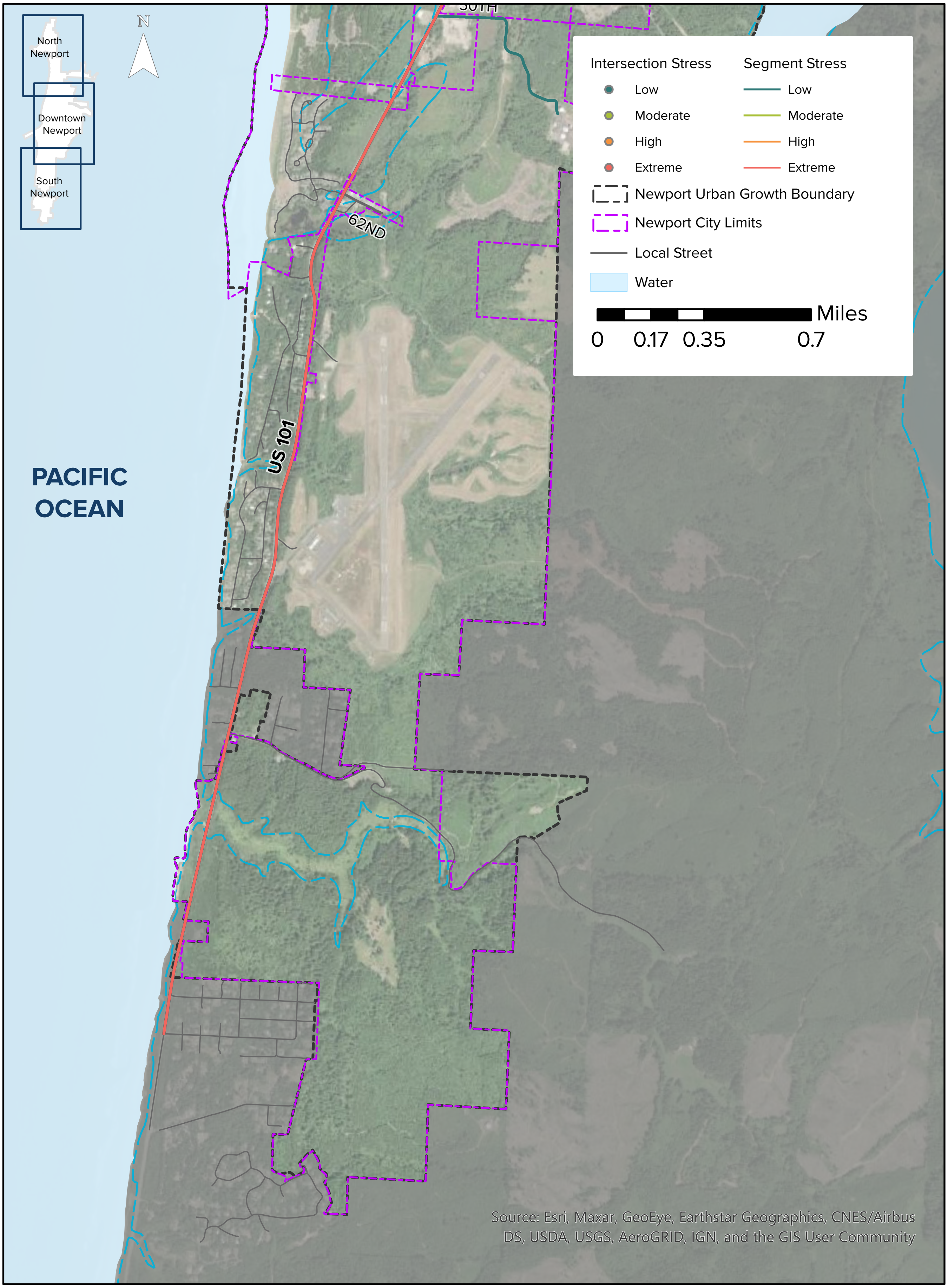
High
Extreme
Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0 0.17 0.35 0.7
AVERY
73RD
60TH
55TH
US 101
36TH
31ST
HARNEY
20TH
OCEANVIEW
NYE
12TH
SPRING
8TH
PACIFIC OCEAN
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


North Newport
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Newport Urban Growth Boundary
Newport City Limits
Local Street
Water
Miles
0
0.17
0.35
0.7
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Existing Transit Service

Lincoln County Transit provides basic transit service to Newport which includes a city loop and inter-city transit service to Lincoln City, Siletz, Yachats, Corvallis, and Albany. Characteristics of this transit service are:

- The Newport city loop completes a full loop through Newport six times each day, seven days a week, and in the evening, there is an additional southbound run to City Hall. Key destinations within Newport served by transit include grocery stores and other shopping, restaurants, local hotels and residences, Newport City Hall, post office, Oregon Coast Aquarium, NOAA facilities, and Nye Beach. Most destinations served by transit are north of Yaquina Bay Bridge or in the South Beach area. City loop buses are wheelchair accessible with bicycle racks.
- Inter-city transit service operates routes to Corvallis and Albany four times each day, to Lincoln City four times each day, to Yachats four times each day, and to Siletz six times a day between Monday and Saturday.
- Lincoln County Transit also operates Dial-A-Ride transit in Newport between Monday and Friday.
- Most Newport residents are within a half mile of a transit stop, and in the downtown core, most residents are within a quarter mile of a transit stop.
- Limited stop amenities (including many unmarked stops) makes the transit system challenging to navigate, particularly for visitors.
- Long headways (up to 90 minutes) and limited service hours (approximately between 7 am and 5pm) for the Newport city loop transit service limits the utility of this service for residents and visitors.
- Transit service is not currently provided south of SE 50th Avenue.

Intersection Operations

Intersection operations were analyzed for existing (2019) conditions and compared to the mobility targets developed by ODOT which use the volume to capacity (v/c) ratio for a performance measure at each study intersection. Mobility targets define an acceptable level of congestion for roadways within Oregon which depends on the roadway functional class and posted speed; these targets are applied to evaluate transportation system improvements and identify potential improvements. Vehicle delay and level of service (LOS) are two other commonly reported operations metrics which can more directly translate to a driver's experience when travelling through an intersection. The correlation between vehicle delay and LOS is summarized below in Table 3 for both signalized and unsignalized intersections.

Table 3: HCM 6th Edition LOS Thresholds[9]

Level of Service	Average Control Delay (s/veh) – Signalized Intersections	Average Control Delay (s/veh) – Unsignalized Intersections	Description
A	≤10	0-10	Free flow
B	>10-20	>10-15	Stable flow (slight delays)
C	>20-35	>15-25	Stable flow (acceptable delays)
D	>35-55	>25-35	Approaching unstable flow (tolerable delay)
E	>55-80	>35-50	Unstable flow (intolerable delay)
F	>80	>50	Forced flow (congested and queues fail to clear)

As shown in Table 4, the intersection of US 101/US 20 currently exceeds its mobility target (v/c ratio – 0.92). All other study intersections operate well within the currently adopted mobility targets. Although these intersections meet the mobility target, many drivers attempting to turn left from an unsignalized side street approach to US 101 or US 20 experience high delay during peak travel periods (>35 seconds or LOS E/F is common at many unsignalized intersections). These approaches typically require more time for an acceptable gap in traffic to make a left turn onto the mainline.

[9] *Highway Capacity Manual 2010*. http://www.seatacwa.gov/home/showdocument?id=11371

Table 4: Study Intersection Operations

#	Study Intersection	Intersection Control	Mobility Target	v/c Ratio	Delay	LOS	Exceeds Mobility Target
1	US 101/73rd	TWSC	0.80/0.95	0.41/0.46	10.8/45.8	B/E	No
2	US 101/52nd	Signal	0.80	0.68*	25.9	C	No
3	US 101/Oceanview	TWSC	0.80/0.95	0.58/0.36	9.9/28.5	A/D	No
4	US 101/36th	TWSC	0.80/0.95	0.58/0.16	10.3/23.3	B/C	No
5	US 101/31st	TWSC	0.80/0.95	0.61/0.16	10.7/24.7	B/C	No
6	US 101/20th	Signal	0.90	0.72*	29.4*	C*	No
7	US 101/11th	Signal	0.90	0.54	5.4	A	No
8	US 101/6th	Signal	0.90	0.69	21.7	C	No
9	US 101/US 20	Signal	0.85	0.92	61.7	E	**Yes**
10	US 101/Angle	TWSC	0.90/0.95	0.37/0.71	10.8/168.5	B/F	No
11	US 101/Hurbert	Signal	0.90	0.74	34.8	C	No
12	US 101/Bayley	UTWSC	0.90/0.95	0.33/0.39	11.2/36.4	B/E	No
13	US 20/Benton	TWSC	0.85/0.95	0.43/0.75	9.8/49.4	A/E	No
14	US 20/Moore	Signal	0.85	0.68	18.8	B	No
15	Oceanview/25th	TWSC	0.95/0.95	0.12/0.08	7.7/10.6	A/B	No
16	11th/Nye	TWSC	0.95/0.95	0.03/0.21	7.3/10.3	A/B	No
17	Harney/7th	AWSC	0.95	0.21	9.8	A	No
18	Hurbert/9th	TWSC	0.95/0.95	0.06/0.41	7.4/14.1	A/B	No
19	Abbey/9th	TWSC	0.95/0.95	0.07/0.21	7.6/12.5	A/B	No

20	Bay/Moore	TWSC	0.95/0.95	0.09/0.2	7.6/11.4	A/B	No

*Reported using HCM 2000

Note: Intersection operations are reported for the entire intersection at traffic signals, for the worst case major street turn movement/worst case minor street turn movement at two-way stop control (TWSC) intersections, and for the worst case turn movement at all-way stop control (AWSC) intersections.

Poor intersection operations is driven by both high seasonal traffic demands and commuting patterns for residents and employees in Newport. Newport's position along the Oregon Coast and US 101 leads to significant variations in traffic throughout the year; traffic volumes along US 101 are approximately 20% higher during July and August compared to average weekday volumes. Newport is also a major employment destination along the Oregon Coast with major employers including Lincoln County, Oregon State University, NOAA, the fishing industry, and the tourism industry. However, many Newport residents still choose to work outside of the city. Approximately 50% of Newport residents commute more than 10 miles to work with key destinations including Corvallis and other coastal towns, while 50% of Newport workers commute more than 10 miles to work from other coastal towns. Similarly, nearly 70% of workers employed in Newport live outside of Newport city limits while almost 55% of Newport's residents work outside of Newport[10].

Key findings

Walking

- Actions to improve driver yielding behavior (*e.g.* signing, lighting, or modified signal phasing) would be effective in reducing the number of crashes involving pedestrians.
- Other enforcement measures (*e.g.* red light cameras) could increase motorist compliance with red signal indications and stop signs.
- The historical built environment (lack of buffered sidewalks) creates a more stressful walking environment within Newport, particularly for high-speed and high-volume facilities like US 101 or US 20.

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[10] US Census. *On the Map. Newport, Oregon.* https://onthemap.ces.census.gov/ Accessed December, 2019.

- Many intersections lack ADA-compliant curb ramps, if ramps are even provided, creating a barrier for pedestrians.
- Installing median refuges on high-volume, high-speed facilities, like US 101, creates a lower stress pedestrian environment at existing unsignalized crossings. Locations with RRFBs can further reduce the crossing stress for pedestrians; RRFBs are currently installed on US 101 at SW Bayley Street, SW Abbey Street, SW Angle Street, NW 3rd Street, NE 10th Street, and NW 15th Street.
- Due to Newport's topography, US 101 is the primary north-south route and provides the only connection for vehicles or pedestrians in certain locations (*e.g.* Yaquina Bay Bridge) creating a significant barrier for pedestrians.
- Sidewalk infill, an ADA transition plan, and a low-stress parallel route to US 101 could improve pedestrian conditions throughout Newport.

Biking

- Actions to improve driver yielding behavior at intersections (*e.g.* bike boxes, signing, or dedicated signal phases) would be effective in reducing the number of crashes involving bicyclists.
- Other enforcement or education measures (*e.g.* camera enforcement, good driver programs, or cycling skills courses) could improve motorist and bicyclist behavior.
- Most collectors in Newport's downtown core operate at low stress (LTS 1) due to a low-speed, shared roadway environment.
- Adding bicycle facilities on collectors or minor arterials with higher speeds (*e.g.* Oceanview Drive north of 12th Street) could reduce the LTS, although many higher speed roadways currently have a constrained roadway width and tend to be more rural in character. Without significant investments in quality bicycle facilities (*e.g.* shared use paths) on these routes, these roads will likely not be suitable for users of all ages and abilities.
- US 101 and US 20 have high or extreme stress for cyclists(LTS 3 or 4) due to their lack of bicycle facilities; even in locations with existing on-street bike lanes (*i.e.* near the US 101/NE 52nd Street/NW Lighthouse Drive intersection), the bicycle LTS remains high due to high operating speeds for vehicles.
- Due to Newport's topography, US 101 is the primary north-south route and provides the only connection for vehicles or bicyclists in certain locations (*e.g.* Yaquina Bay Bridge) creating a significant barrier for bicyclists.

- Traffic signals provide the best opportunities for bicyclists to cross US 101 due to the speed and total number of lanes although Newport has relatively few traffic signals. While existing RRFBs can serve pedestrians crossing US 101, RRFBs are typically placed only on one intersection leg or mid-block which does not serve cyclists travelling from both directions.
- Developing a comprehensive bicycle network, including a low-stress, parallel route to US 101 would reduce total conflicts between bicycles and vehicles.

Transit

Lincoln County Transit provides service in Newport and manages potential transit improvements. Noted existing needs from Lincoln County's Transit Development Plan[11] include:

- Increase transit frequency and service hours, particularly for midday, evening, and weekend service or for alternate work schedules
- Expand dial-a-ride service areas and increase service hours to allow customers to complete multiple errands
- Create tourist-oriented routes in Newport (*e.g.* Nye Beach to Bayfront)
- Improve transit facilities and stop accessibility
- Improve ease of use through new technology or other public information

Driving

- The US 101/US 20 intersection currently exceeds its mobility target (v/c ratio – 0.92) during the summer peak in Newport (30 HV conditions).
- Side street approaches at unsignalized intersections with US 101 experience high delay, particularly for left-turning vehicles.
- There are limited parallel routes to US 101 for north-south vehicle traffic in Newport including:
    - Between SW Naterlin Drive and SW Abalone Street (Yaquina Bay Bridge)
    - Between NE 12th Street and NE 52nd Street (Northbound traffic only)

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11 Lincoln County Transit. Transit Development Plan. 2018.

- Between NW Oceanview Drive and NE 52nd Street (Southbound traffic only)
  - South of SE 42nd Street
- Limited parallel routes outside of US 101 can isolate neighborhoods and residential areas in Newport that are located outside the downtown core whose only access is to US 101, including Agate Beach, South Beach, and San-Bay-O Circle
- Local street connectivity is limited in parts of Newport, including within the downtown core. Existing gaps in the street network include SW 7th Street and NE 3rd Street
- Limited parking in tourist-oriented areas such as Nye Beach and the Bay front, particularly during peak summer
- Bay front is a unique working waterfront and is a significant freight generator for the City of Newport. Freight traffic may have difficulties navigating parking vehicles and heavy pedestrian traffic during peak summer.

Appendix

General & Site Information	
Analyst:	Rochelle Starrett
Agency/Company:	DKS
Date:	8/7/2019
Project Name:	Newport TSP

Intersection Crash Data

Intersection	**Intersection Type**	**Year** 2013	**2014**	**2015**	**2016**	**2017**	**Total**	
US 101/73rd	Urban 4ST	0	0	0	0	0	0	
US 101/52nd	Urban 4SG	5	0	4	3	3	15	
US 101/Oceanview	Urban 3ST	1	0	1	1	0	3	
US 101/36th	Urban 3ST	1	3	1	2	0	7	
US 101/31st	Urban 3ST	1	0	2	1	0	4	
US 101/20th	Urban 4SG	8	5	1	8	4	26	
US 101/11th	Urban 4SG	1	1	2	6	5	15	
US 101/6th	Urban 4SG	4	3	1	4	3	15	
US 101/US 20	Urban 4SG	8	4	9	6	5	32	
US 101/Angle	Urban 4ST	3	2	0	5	1	11	
US 101/Hurbert	Urban 4SG	3	1	5	4	3	16	
US 101/Bayley	Urban 4ST	3	3	2	2	4	14	
US 20/Benton	Urban 4ST	1	0	1	2	1	5	
US 20/Moore	Urban 4SG	1	2	1	7	5	16	
								AWSC
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
	Total	40	24	30	51	34	179	

Intersection Population Type Crash Rate				
Average Crash Rate per intersection type				
Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	0	0		
Rural 4SG	0	0		
Rural 4ST	0	0		
Urban 3ST	14	99	0.1421	3
Urban 3SG	0	0		
Urban 4ST	30	130	0.2309	4
Urban 4SG	135	309	0.4372	7

Critical Rate Calculation														
Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical	APM Exhibit 4-1 Reference Population Crash Rate		Critical Rate	Over Critical	90th Percentile Rate	Over 90th Percentile
US 101/73rd	12,720	23.2	0	Urban 4ST	0.00	APM Exhibit 4-1			0.198		0.37	Under	0.408	Under
US 101/52nd	17,990	32.8	15	Urban 4SG	0.46	0.44	0.64	Under	0.437		0.64	Under	0.86	Under
US 101/Oceanview	18,310	33.4	3	Urban 3ST	0.09	APM Exhibit 4-1			0.131		0.25	Under	0.293	Under
US 101/36th	17,610	32.1	7	Urban 3ST	0.22	APM Exhibit 4-1			0.131		0.25	Under	0.293	Under
US 101/31st	18,080	33.0	4	Urban 3ST	0.12	APM Exhibit 4-1			0.131		0.25	Under	0.293	Under
US 101/20th	26,810	48.9	26	Urban 4SG	0.53	0.44	0.60	Under	0.437		0.60	Under	0.86	Under
US 101/11th	26,530	48.4	15	Urban 4SG	0.31	0.44	0.60	Under	0.437		0.60	Under	0.86	Under
US 101/6th	26,910	49.1	15	Urban 4SG	0.31	0.44	0.60	Under	0.437		0.60	Under	0.86	Under
US 101/US 20	32,740	59.8	32	Urban 4SG	0.54	0.44	0.59	Under	0.437		0.59	Under	0.86	Under
US 101/Angle	20,780	37.9	11	Urban 4ST	0.29	APM Exhibit 4-1			0.198		0.33	Under	0.408	Under
US 101/Hurbert	19,580	35.7	16	Urban 4SG	0.45	0.44	0.63	Under	0.437		0.63	Under	0.86	Under
US 101/Bayley	20,830	38.0	14	Urban 4ST	0.37	APM Exhibit 4-1			0.198		0.33	**Over**	0.408	Under
US 20/Benton	16,850	30.8	5	Urban 4ST	0.16	APM Exhibit 4-1			0.198		0.35	Under	0.408	Under
US 20/Moore	18,650	34.0	16	Urban 4SG	0.47	0.44	0.64	Under	0.437		0.64	Under	0.86	Under

General & Site Information	
Analyst:	Rochelle Starrett
Agency/Company:	DKS
Date:	8/7/2019
Project Name:	Newport TSP

Intersection Crash Data

Intersection	Intersection Type	Year 2013	2014	2015	2016	2017	Total	
Oceanview/25th	Urban 4ST	0	1	1	0	0	2	
11th/Nye	Urban 4ST	2	0	1	1	1	5	
Harney/7th	Rural 4ST	0	0	0	0	0	0	AWSC
Hurbert/9th	Urban 4ST	0	1	1	3	2	7	
Abbey/9th	Urban 4ST	0	0	0	1	2	3	
Bay/Moore	Urban 3ST	2	1	0	0	1	4	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
	Total	4	3	3	5	6	21	

Intersection Population Type Crash Rate				
Average Crash Rate per intersection type				
Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	0	0		
Rural 4SG	0	0		
Rural 4ST	0	7	0.0000	1
Urban 3ST	4	9	0.4634	1
Urban 3SG	0	0		
Urban 4ST	17	25	0.6745	4
Urban 4SG	0	0		

Critical Rate Calculation														
Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical	APM Exhibit 4-1 Reference Population Crash Rate		Critical Rate	Over Critical	90th Percentile Rate	Over 90th Percentile
Oceanview/25th	3,160	5.8	2	Urban 4ST	0.35	APM Exhibit 4-1			0.198		0.59	Under	0.408	Under
11th/Nye	2,850	5.2	5	Urban 4ST	0.96	APM Exhibit 4-1			0.198		0.62	**Over**	0.408	**Over**
Harney/7th	3,730	6.8	0	Rural 4ST	0.00	APM Exhibit 4-1			0.434		0.92	Under	1.08	Under
Hurbert/9th	4,180	7.6	7	Urban 4ST	0.92	APM Exhibit 4-1			0.198		0.53	**Over**	0.408	**Over**
Abbey/9th	3,620	6.6	3	Urban 4ST	0.45	APM Exhibit 4-1			0.198		0.56	Under	0.408	**Over**
Bay/Moore	4,730	8.6	4	Urban 3ST	0.46	APM Exhibit 4-1			0.131		0.39	**Over**	0.293	**Over**

POSITIVE EXCESS PROPORTION OF CRASHES (FLAGGED IF GREATER THAN 0.1)

Name	Int	Ref Pop	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear
US 101/73rd	1	U4ST													
US 101/52nd	2	U4SG												0.030	0.200
US 101/Oceanview	3	U3ST												0.143	
US 101/36th	4	U3ST												0.000	0.000
US 101/31st	5	U3ST												0.000	0.107
US 101/20th	6	U4SG	0.041	0.047									0.032	0.000	0.005
US 101/11th	7	U4SG	0.000		0.119	0.044					0.030			0.096	0.000
US 101/6th	8	U4SG	0.000											0.030	0.133
US 101/US 20	9	U4SG	0.020	0.033		0.009					0.025		0.018	0.013	0.000
US 101/Angle	10	U4ST	0.106			0.024							0.115	0.015	0.000
US 101/Hurbert	11	U4SG				0.040	0.055				0.088		0.081	0.000	0.000
US 101/Bayley	12	U4ST	0.000			0.005					0.038			0.000	0.214
US 20/Benton	13	U4ST	0.033											0.233	0.000
US 20/Moore	14	U4SG	0.051											0.013	0.092
Oceanview/25th	15														
11th/Nye	16														
Harney/7th - AWSC	17														
Hurbert/9th	18														
Abbey/9th	19														
Bay/Moore	20														

POSITIVE EXCESS PROPORTION OF CRASHES (FLAGGED IF GREATER THAN 0.1)

Name	Int	Ref Pop	Angle	Back	Bike	Fix		Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear
US 101/73rd	1															
US 101/52nd	2															
US 101/Oceanvie	3															
US 101/36th	4															
US 101/31st	5															
US 101/20th	6															
US 101/11th	7															
US 101/6th	8															
US 101/US 20	9															
US 101/Angle	10															
US 101/Hurbert	11															
US 101/Bayley	12															
US 20/Benton	13															
US 20/Moore	14															
Oceanview/25th	15	U4ST					0.441								0.441	
11th/Nye	16	U4ST	0.176													
Harney/7th - AW	17	R4ST														
Hurbert/9th	18	U4ST	0.034													0.084
Abbey/9th	19	U4ST	0.176													
Bay/Moore	20	U3ST	0.000				0.000								0.000	

					Total Crashes							Crash Rate							Statewide Crash Rate						
Start MP	Road	Section	Type	Miles	2017	2016	2015	2014	2013	2012	Total	2017	2016	2015	2014	2013	2012	Avg	2017	2016	2015	2014	2013	2012	Average
136.2	US 101	Newport UA to CL	Suburban	0.33	2	0	0	0	3	0	5	1.63	0	0	0	2.83	0	0.892	1.39	1.41	1.45	1.7	1.45	1.71	1.48
136.53	US 101	Newport CL to Agate Beach	Urban	1.08	7	8	2	4	5	3	26	1.43	1.6	0.41	0.74	0.92	0.55	1.02	2.95	3.2	3.11	2.93	2.82	2.8	3.002
137.61	US 101	Agate Beach (52nd) to US 20	Urban	2.75	49	82	51	61	62	48	305	2.6	4.27	2.71	3.21	3.26	2.52	**3.21**	2.95	3.2	3.11	2.93	2.82	2.8	3.002
140.36	US 101	US 20 to Yaquina Bay Bridge	Urban	2.15	37	40	52	31	26	37	186	2.83	3	3.98	2.36	1.97	2.79	2.828	2.95	3.2	3.11	2.93	2.82	2.8	3.002
0	US 20	US 101 to Newport CL	Urban	0.76	12	14	13	9	7	11	55	3.23	3.69	3.49	2.26	1.75	2.74	2.884	2.95	3.2	3.11	2.93	2.82	2.8	3.002
0.76	US 20	Newport CL to UA	Suburban	1.08	1	8	4	2	1	4	16	0.23	1.79	0.91	0.39	0.19	0.78	0.702	1.39	1.41	1.45	1.7	1.45	1.71	1.48

Data Source: ODOT Crash Rate Tables, 2012-2017

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	4	59	0	9	3	655	34	13	492	2
Future Vol, veh/h	1	0	4	59	0	9	3	655	34	13	492	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	0	0	0	3	38	69	3	0
Mvmt Flow	1	0	4	62	0	9	3	689	36	14	518	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1265	1278	519	1244	1243	689	520	0	0	725	0	0
Stage 1	547	547	-	695	695	-	-	-	-	-	-	-
Stage 2	718	731	-	549	548	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.17	6.5	6.2	4.1	-	-	4.79	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.563	4	3.3	2.2	-	-	2.821	-	-
Pot Cap-1 Maneuver	147	168	561	147	176	449	1056	-	-	638	-	-
Stage 1	525	521	-	425	447	-	-	-	-	-	-	-
Stage 2	423	430	-	511	520	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	141	164	561	143	172	449	1056	-	-	638	-	-
Mov Cap-2 Maneuver	141	164	-	143	172	-	-	-	-	-	-	-
Stage 1	523	510	-	424	446	-	-	-	-	-	-	-
Stage 2	413	429	-	496	509	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	45.8	0	0.3
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1056	-	-	352	157	638	-	-
HCM Lane V/C Ratio	0.003	-	-	0.015	0.456	0.021	-	-
HCM Control Delay (s)	8.4	-	-	15.4	45.8	10.8	-	-
HCM Lane LOS	A	-	-	C	E	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	2.1	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	2	86	49	0	8	50	818	73	17	635	28
Future Volume (veh/h)	33	2	86	49	0	8	50	818	73	17	635	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1750	1750	1750	1695	1682	1750	1750	1695	1750
Adj Flow Rate, veh/h	35	2	91	52	0	8	53	861	0	18	668	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	0	0	0	4	5	0	0	4	0
Cap, veh/h	74	2	394	76	0	397	74	972		42	944	
Arrive On Green	0.26	0.27	0.27	0.26	0.00	0.27	0.05	0.58	0.00	0.03	0.56	0.00
Sat Flow, veh/h	0	8	1461	0	0	1472	1615	1682	1483	1667	1695	1483
Grp Volume(v), veh/h	37	0	91	52	0	8	53	861	0	18	668	0
Grp Sat Flow(s),veh/h/ln	8	0	1461	0	0	1472	1615	1682	1483	1667	1695	1483
Q Serve(g_s), s	0.0	0.0	4.6	0.0	0.0	0.4	3.1	41.8	0.0	1.0	27.2	0.0
Cycle Q Clear(g_c), s	25.0	0.0	4.6	25.0	0.0	0.4	3.1	41.8	0.0	1.0	27.2	0.0
Prop In Lane	0.95		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	76	0	394	76	0	397	74	972		42	944	
V/C Ratio(X)	0.49	0.00	0.23	0.68	0.00	0.02	0.71	0.89		0.43	0.71	
Avail Cap(c_a), veh/h	76	0	394	76	0	397	436	1104		450	1113	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.6	0.0	26.9	47.1	0.0	25.3	44.5	17.2	0.0	45.4	15.3	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.2	20.7	0.0	0.0	9.0	9.1	0.0	5.0	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.6	1.7	0.0	0.1	1.4	15.7	0.0	0.5	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	0.0	27.1	67.7	0.0	25.3	53.5	26.4	0.0	50.4	17.7	0.0
LnGrp LOS	D	A	C	E	A	C	D	C		D	B	
Approach Vol, veh/h		128			60			914	A		686	A
Approach Delay, s/veh		33.4			62.1			27.9			18.6	
Approach LOS		C			E			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.3	56.6		29.5	6.4	58.6		29.5
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5
Max Green Setting (Gmax), s	25.0	60.0		25.0	25.0	60.0		25.0
Max Q Clear Time (g_c+I1), s	5.1	29.2		27.0	3.0	43.8		27.0
Green Ext Time (p_c), s	0.1	8.8		0.0	0.0	8.8		0.0

Intersection Summary	
HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	59	22	19	932	747	52
Future Vol, veh/h	59	22	19	932	747	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	300	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	11	5	4	4
Mvmt Flow	63	23	20	991	795	55

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1826	795	850	0	-	0
Stage 1	795	-	-	-	-	-
Stage 2	1031	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.299	-	-	-
Pot Cap-1 Maneuver	86	391	751	-	-	-
Stage 1	448	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	84	391	751	-	-	-
Mov Cap-2 Maneuver	208	-	-	-	-	-
Stage 1	436	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.5	0.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	751	-	238	-	-
HCM Lane V/C Ratio	0.027	-	0.362	-	-
HCM Control Delay (s)	9.9	-	28.5	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1.6	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	13	927	38	10	752
Future Vol, veh/h	21	13	927	38	10	752
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	125	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	31	4	0	0	3
Mvmt Flow	22	14	986	40	11	800

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1808	986	0	0	1026	0
Stage 1	986	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Critical Hdwy	6.4	6.51	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.579	-	-	2.2	-
Pot Cap-1 Maneuver	88	265	-	-	685	-
Stage 1	364	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	87	265	-	-	685	-
Mov Cap-2 Maneuver	217	-	-	-	-	-
Stage 1	358	-	-	-	-	-
Stage 2	435	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	233	685	-
HCM Lane V/C Ratio	-	-	0.155	0.016	-
HCM Control Delay (s)	-	-	23.3	10.3	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	7	957	48	9	763
Future Vol, veh/h	24	7	957	48	9	763
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	50	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	14	5	0	0	3
Mvmt Flow	26	8	1040	52	10	829

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1889	1040	0	0	1092	0
Stage 1	1040	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Critical Hdwy	6.4	6.34	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.426	-	-	2.2	-
Pot Cap-1 Maneuver	78	265	-	-	647	-
Stage 1	344	-	-	-	-	-
Stage 2	423	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	77	265	-	-	647	-
Mov Cap-2 Maneuver	205	-	-	-	-	-
Stage 1	339	-	-	-	-	-
Stage 2	423	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	216	647	-
HCM Lane V/C Ratio	-	-	0.156	0.015	-
HCM Control Delay (s)	-	-	24.7	10.7	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	51	79	293	26	80	58	1028	98	65	848	18
Future Volume (vph)	37	51	79	293	26	80	58	1028	98	65	848	18
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694	1405	1564	1495		1630	3159		1614	3218	
Flt Permitted		0.98	1.00	0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1694	1405	1564	1495		1630	3159		1614	3218	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	40	55	85	315	28	86	62	1105	105	70	912	19
RTOR Reduction (vph)	0	0	77	0	23	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	95	8	220	186	0	62	1205	0	70	930	0
Confl. Peds. (#/hr)	4		4	4		4	7		2	2		7
Heavy Vehicles (%)	0%	2%	4%	1%	0%	2%	2%	4%	0%	3%	3%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		10.6	10.6	21.6	21.6		7.8	61.2		8.1	61.5	
Effective Green, g (s)		11.1	11.1	22.1	22.1		8.3	62.2		8.6	62.5	
Actuated g/C Ratio		0.09	0.09	0.18	0.18		0.07	0.52		0.07	0.52	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)		2.5	2.5	2.5	2.5		2.5	5.1		2.5	5.1	
Lane Grp Cap (vph)		156	129	288	275		112	1637		115	1676	
v/s Ratio Prot		c0.06		c0.14	0.12		0.04	c0.38		c0.04	0.29	
v/s Ratio Perm			0.01									
v/c Ratio		0.61	0.06	0.76	0.68		0.55	0.74		0.61	0.55	
Uniform Delay, d1		52.4	49.7	46.5	45.6		54.1	22.5		54.1	19.4	
Progression Factor		1.00	1.00	1.00	1.00		0.98	0.78		1.00	1.00	
Incremental Delay, d2		5.6	0.1	10.9	5.9		4.1	2.6		7.5	1.3	
Delay (s)		57.9	49.8	57.4	51.5		57.3	20.1		61.5	20.7	
Level of Service		E	D	E	D		E	C		E	C	
Approach Delay (s)		54.1			54.5			21.9			23.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	15	24	26	9	49	10	1209	15	15	1189	21
Future Volume (veh/h)	71	15	24	26	9	49	10	1209	15	15	1189	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1709	1709
Adj Flow Rate, veh/h	75	16	25	27	9	52	11	1273	16	16	1252	22
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	3	0	3	3
Cap, veh/h	143	28	34	77	33	102	24	2536	32	30	2532	44
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.03	1.00	1.00	0.04	1.00	1.00
Sat Flow, veh/h	856	260	307	342	300	927	1667	3283	41	1667	3263	57
Grp Volume(v), veh/h	116	0	0	88	0	0	11	629	660	16	623	651
Grp Sat Flow(s),veh/h/ln	1422	0	0	1569	0	0	1667	1624	1700	1667	1624	1697
Q Serve(g_s), s	3.3	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.0	6.3	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0
Prop In Lane	0.65		0.22	0.31		0.59	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	199	0	0	205	0	0	24	1254	1314	30	1260	1317
V/C Ratio(X)	0.58	0.00	0.00	0.43	0.00	0.00	0.46	0.50	0.50	0.53	0.49	0.49
Avail Cap(c_a), veh/h	352	0	0	362	0	0	125	1254	1314	125	1260	1317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.65	0.65	0.65	0.79	0.79	0.79
Uniform Delay (d), s/veh	52.0	0.0	0.0	50.6	0.0	0.0	57.8	0.0	0.0	57.4	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	1.1	0.0	0.0	6.4	0.9	0.9	8.4	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	2.6	0.0	0.0	0.4	0.3	0.3	0.5	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	0.0	0.0	51.7	0.0	0.0	64.3	0.9	0.9	65.8	1.1	1.1
LnGrp LOS	D	A	A	D	A	A	E	A	A	E	A	A
Approach Vol, veh/h		116			88			1300			1290	
Approach Delay, s/veh		54.0			51.7			1.5			1.9	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	97.1		17.1	6.2	96.7		17.1
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5
Max Green Setting (Gmax), s	8.5	72.0		25.5	8.5	72.0		25.5
Max Q Clear Time (g_c+I1), s	2.8	2.0		8.3	3.1	2.0		11.5
Green Ext Time (p_c), s	0.0	37.7		0.3	0.0	38.4		0.4

Intersection Summary	
HCM 6th Ctrl Delay	5.4
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
8: US 101 & 6th St

09/17/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	31	30	72	16	33	31	1177	20	21	1146	26
Future Volume (veh/h)	88	31	30	72	16	33	31	1177	20	21	1146	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1695	1695
Adj Flow Rate, veh/h	98	34	33	80	18	37	34	1308	22	23	1273	29
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	3	0	4	4
Cap, veh/h	127	44	43	111	25	51	49	1940	33	37	1888	43
Arrive On Green	0.11	0.13	0.11	0.10	0.12	0.10	0.02	0.40	0.39	0.04	1.00	1.00
Sat Flow, veh/h	972	337	327	957	215	442	1667	3267	55	1667	3219	73
Grp Volume(v), veh/h	165	0	0	135	0	0	34	650	680	23	637	665
Grp Sat Flow(s),veh/h/ln	1637	0	0	1614	0	0	1667	1624	1699	1667	1611	1681
Q Serve(g_s), s	11.7	0.0	0.0	9.7	0.0	0.0	2.4	39.5	39.6	1.6	0.0	0.0
Cycle Q Clear(g_c), s	11.7	0.0	0.0	9.7	0.0	0.0	2.4	39.5	39.6	1.6	0.0	0.0
Prop In Lane	0.59		0.20	0.59		0.27	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	214	0	0	187	0	0	49	964	1008	37	944	986
V/C Ratio(X)	0.77	0.00	0.00	0.72	0.00	0.00	0.70	0.67	0.67	0.63	0.67	0.67
Avail Cap(c_a), veh/h	218	0	0	215	0	0	153	964	1008	153	944	986
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.48	0.48	0.48	0.86	0.86	0.86
Uniform Delay (d), s/veh	51.2	0.0	0.0	52.0	0.0	0.0	58.3	26.6	26.6	56.9	0.0	0.0
Incr Delay (d2), s/veh	14.5	0.0	0.0	8.7	0.0	0.0	6.2	1.8	1.8	10.7	3.3	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.0	0.0	4.5	0.0	0.0	1.1	16.5	17.2	0.8	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.7	0.0	0.0	60.8	0.0	0.0	64.5	28.4	28.4	67.6	3.3	3.2
LnGrp LOS	E	A	A	E	A	A	E	C	C	E	A	A
Approach Vol, veh/h		165			135			1364			1325	
Approach Delay, s/veh		65.7			60.8			29.3			4.4	
Approach LOS		E			E			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	74.9		17.9	6.6	75.7		19.7				
Change Period (Y+Rc), s	4.5	6.5		6.0	4.5	6.5		6.0				
Max Green Setting (Gmax), s	10.5	58.5		14.0	10.5	58.5		14.0				
Max Q Clear Time (g_c+I1), s	4.4	2.0		11.7	3.6	41.6		13.7				
Green Ext Time (p_c), s	0.0	21.7		0.1	0.0	14.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			21.7									
HCM 6th LOS			C									
Notes												

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	193	190	28	239	159	280	60	784	193	306	777	65
Future Volume (veh/h)	193	190	28	239	159	280	60	784	193	306	777	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	205	202	30	254	169	298	64	834	0	326	827	69
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	7	2	2	0	4	10	4	3	3
Cap, veh/h	237	238	35	276	334	274	87	1007		350	1444	120
Arrive On Green	0.14	0.16	0.16	0.17	0.19	0.19	0.05	0.31	0.00	0.07	0.16	0.15
Sat Flow, veh/h	1654	1468	218	1576	1723	1410	1667	3221	1367	1615	3027	253
Grp Volume(v), veh/h	205	0	232	254	169	298	64	834	0	326	443	453
Grp Sat Flow(s),veh/h/ln	1654	0	1686	1576	1723	1410	1667	1611	1367	1615	1624	1656
Q Serve(g_s), s	14.5	0.0	16.0	19.0	10.5	23.3	4.5	28.8	0.0	24.1	30.4	30.4
Cycle Q Clear(g_c), s	14.5	0.0	16.0	19.0	10.5	23.3	4.5	28.8	0.0	24.1	30.4	30.4
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	237	0	274	276	334	274	87	1007		350	774	790
V/C Ratio(X)	0.86	0.00	0.85	0.92	0.51	1.09	0.73	0.83		0.93	0.57	0.57
Avail Cap(c_a), veh/h	289	0	295	276	334	274	153	1007		350	774	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.65	0.65	0.65
Uniform Delay (d), s/veh	50.3	0.0	48.9	48.7	43.2	48.4	56.0	38.2	0.0	54.8	39.2	39.3
Incr Delay (d2), s/veh	18.9	0.0	18.5	33.9	1.2	80.4	8.5	7.8	0.0	25.1	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.0	8.2	10.0	4.6	14.3	2.1	12.5	0.0	12.9	13.7	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.1	0.0	67.3	82.5	44.5	128.8	64.5	46.1	0.0	80.0	41.2	41.2
LnGrp LOS	E	A	E	F	D	F	E	D		E	D	D
Approach Vol, veh/h		437			721			898	A		1222	
Approach Delay, s/veh		68.2			92.7			47.4			51.6	
Approach LOS		E			F			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	61.2	21.2	27.3	30.0	41.5	25.0	23.5				
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5				
Max Green Setting (Gmax), s	10.5	50.0	20.5	20.5	25.5	35.0	20.5	20.5				
Max Q Clear Time (g_c+I1), s	16.5	32.4	16.5	25.3	26.1	30.8	21.0	18.0				
Green Ext Time (p_c), s	0.0	9.5	0.2	0.0	0.0	2.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			61.7									
HCM 6th LOS			E									

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	12	12	7	8	105	7	894	11	45	924	44
Future Vol, veh/h	9	12	12	7	8	105	7	894	11	45	924	44
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	10	13	13	8	9	115	8	982	12	49	1015	48

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1671	2180	571	1644	2198	508	1085	0	0	1005	0	0
Stage 1	1159	1159	-	1015	1015	-	-	-	-	-	-	-
Stage 2	512	1021	-	629	1183	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.78	6.5	6.94	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.78	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.78	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.64	4	3.32	2.2	-	-	2.24	-	-
Pot Cap-1 Maneuver	64	47	469	58	45	510	651	-	-	673	-	-
Stage 1	212	272	-	234	318	-	-	-	-	-	-	-
Stage 2	518	316	-	409	265	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	33	36	452	33	35	505	637	-	-	666	-	-
Mov Cap-2 Maneuver	33	36	-	33	35	-	-	-	-	-	-	-
Stage 1	202	218	-	225	306	-	-	-	-	-	-	-
Stage 2	377	304	-	300	212	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	168.5	61.9	0.2	1.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	637	-	-	52	185	666	-	-
HCM Lane V/C Ratio	0.012	-	-	0.697	0.713	0.074	-	-
HCM Control Delay (s)	10.7	0.1	-	168.5	61.9	10.8	0.9	-
HCM Lane LOS	B	A	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	2.8	4.5	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	22	34	67	40	44	20	768	9	38	859	20
Future Volume (veh/h)	37	22	34	67	40	44	20	768	9	38	859	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.98		0.98	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1682	1682	1682	1695	1695	1695	1723	1723	1723
Adj Flow Rate, veh/h	38	23	35	69	41	45	21	792	9	39	886	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	5	5	5	4	4	4	2	2	2
Cap, veh/h	103	64	71	121	63	58	26	1044	12	59	1413	35
Arrive On Green	0.13	0.14	0.13	0.13	0.14	0.13	0.31	0.32	0.31	0.58	0.59	0.58
Sat Flow, veh/h	440	459	516	562	458	417	82	3256	39	135	3205	80
Grp Volume(v), veh/h	96	0	0	155	0	0	431	0	391	497	0	449
Grp Sat Flow(s),veh/h/ln	1414	0	0	1436	0	0	1691	0	1686	1716	0	1703
Q Serve(g_s), s	0.0	0.0	0.0	5.1	0.0	0.0	27.9	0.0	24.6	23.4	0.0	20.2
Cycle Q Clear(g_c), s	7.3	0.0	0.0	12.5	0.0	0.0	27.9	0.0	24.6	23.4	0.0	20.2
Prop In Lane	0.40		0.36	0.45		0.29	0.05		0.02	0.08		0.05
Lane Grp Cap(c), veh/h	232	0	0	236	0	0	542	0	541	756	0	751
V/C Ratio(X)	0.41	0.00	0.00	0.66	0.00	0.00	0.79	0.00	0.72	0.66	0.00	0.60
Avail Cap(c_a), veh/h	273	0	0	276	0	0	620	0	618	756	0	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.7	0.0	0.0	50.0	0.0	0.0	37.2	0.0	36.1	18.8	0.0	18.1
Incr Delay (d2), s/veh	0.9	0.0	0.0	3.7	0.0	0.0	8.6	0.0	5.7	4.4	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	4.8	0.0	0.0	12.9	0.0	11.0	9.2	0.0	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.6	0.0	0.0	53.7	0.0	0.0	45.8	0.0	41.7	23.2	0.0	21.6
LnGrp LOS	D	A	A	D	A	A	D	A	D	C	A	C
Approach Vol, veh/h		96			155			822			946	
Approach Delay, s/veh		48.6			53.7			43.9			22.4	
Approach LOS		D			D			D			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		56.9		20.6		42.5		20.6				
Change Period (Y+Rc), s		5.0		4.5		5.0		4.5				
Max Green Setting (Gmax), s		43.0		19.5		43.0		19.5				
Max Q Clear Time (g_c+I1), s		25.4		14.5		29.9		9.3				
Green Ext Time (p_c), s		10.0		0.3		7.6		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		34.8
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	56	9	0	27	25	955	7	6	968	18
Future Vol, veh/h	12	0	56	9	0	27	25	955	7	6	968	18
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	13	0	62	10	0	30	28	1061	8	7	1076	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1710	2246	561	1681	2252	553	1109	0	0	1077	0	0
Stage 1	1113	1113	-	1129	1129	-	-	-	-	-	-	-
Stage 2	597	1133	-	552	1123	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	60	42	476	63	42	482	614	-	-	655	-	-
Stage 1	226	286	-	221	281	-	-	-	-	-	-	-
Stage 2	461	280	-	491	283	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	52	38	470	51	38	474	606	-	-	650	-	-
Mov Cap-2 Maneuver	52	38	-	51	38	-	-	-	-	-	-	-
Stage 1	213	275	-	209	266	-	-	-	-	-	-	-
Stage 2	408	265	-	414	272	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.9	36.4	0.3	0.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	606	-	-	194	154	650	-	-
HCM Lane V/C Ratio	0.046	-	-	0.389	0.26	0.01	-	-
HCM Control Delay (s)	11.2	-	-	34.9	36.4	10.6	0.1	-
HCM Lane LOS	B	-	-	D	E	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	1	0	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	654	38	109	624	4	16	3	177	5	6	37
Future Vol, veh/h	12	654	38	109	624	4	16	3	177	5	6	37
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	13	688	40	115	657	4	17	3	186	5	6	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	662	0	0	729	0	0	1648	1627	710	1720	1645	661
Stage 1	-	-	-	-	-	-	735	735	-	890	890	-
Stage 2	-	-	-	-	-	-	913	892	-	830	755	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	936	-	-	866	-	-	77	103	432	71	101	461
Stage 1	-	-	-	-	-	-	405	428	-	340	364	-
Stage 2	-	-	-	-	-	-	322	363	-	367	420	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	935	-	-	865	-	-	59	88	431	35	86	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	88	-	35	86	-
Stage 1	-	-	-	-	-	-	399	422	-	335	315	-
Stage 2	-	-	-	-	-	-	250	314	-	204	414	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.4	49.4	36.4
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	274	935	-	-	865	-	-	164
HCM Lane V/C Ratio	0.753	0.014	-	-	0.133	-	-	0.308
HCM Control Delay (s)	49.4	8.9	-	-	9.8	-	-	36.4
HCM Lane LOS	E	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	5.5	0	-	-	0.5	-	-	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	680	135	37	453	71	106	50	46	137	64	37
Future Volume (veh/h)	49	680	135	37	453	71	106	50	46	137	64	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1750	1750	1750
Adj Flow Rate, veh/h	53	739	147	40	492	77	115	54	50	149	70	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	0	0	0
Cap, veh/h	83	1238	246	76	764	627	341	142	456	255	113	52
Arrive On Green	0.05	0.45	0.44	0.05	0.45	0.45	0.31	0.32	0.32	0.31	0.32	0.31
Sat Flow, veh/h	1537	2721	541	1628	1709	1402	785	446	1430	535	353	162
Grp Volume(v), veh/h	53	444	442	40	492	77	169	0	50	259	0	0
Grp Sat Flow(s),veh/h/ln	1537	1637	1625	1628	1709	1402	1232	0	1430	1050	0	0
Q Serve(g_s), s	2.3	13.6	13.7	1.6	14.9	2.1	0.0	0.0	1.7	9.7	0.0	0.0
Cycle Q Clear(g_c), s	2.3	13.6	13.7	1.6	14.9	2.1	7.3	0.0	1.7	16.9	0.0	0.0
Prop In Lane	1.00		0.33	1.00		1.00	0.68		1.00	0.58		0.15
Lane Grp Cap(c), veh/h	83	745	739	76	764	627	474	0	456	412	0	0
V/C Ratio(X)	0.64	0.60	0.60	0.53	0.64	0.12	0.36	0.00	0.11	0.63	0.00	0.00
Avail Cap(c_a), veh/h	471	1003	997	499	1048	860	665	0	652	608	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.0	13.6	13.8	31.2	14.3	10.8	18.0	0.0	16.1	23.2	0.0	0.0
Incr Delay (d2), s/veh	5.8	2.9	3.0	4.1	3.5	0.3	0.3	0.0	0.1	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.0	5.1	0.7	5.8	0.7	2.0	0.0	0.5	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	16.6	16.7	35.3	17.8	11.1	18.3	0.0	16.1	24.8	0.0	0.0
LnGrp LOS	D	B	B	D	B	B	B	A	B	C	A	A
Approach Vol, veh/h		939			609			219			259	
Approach Delay, s/veh		17.8			18.1			17.8			24.8	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	34.4		25.3	7.6	33.9		25.3
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		30.0
Max Q Clear Time (g_c+I1), s	3.6	15.7		18.9	4.3	16.9		9.3
Green Ext Time (p_c), s	0.0	13.8		1.2	0.1	8.5		0.9

Intersection Summary			
HCM 6th Ctrl Delay			18.8
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection												
Int Delay, s/veh	1.8											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	28	0	14	0	89	82	16	87	0
Future Vol, veh/h	0	0	0	28	0	14	0	89	82	16	87	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	7	0	0	0	0	0	0	2	0
Mvmt Flow	0	0	0	35	0	17	0	110	101	20	107	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	316	359	107	309	309	162	107	0	0	212	0	0
Stage 1	147	147	-	162	162	-	-	-	-	-	-	-
Stage 2	169	212	-	147	147	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.17	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.563	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	641	571	953	634	609	888	1497	-	-	1370	-	-
Stage 1	860	779	-	828	768	-	-	-	-	-	-	-
Stage 2	838	731	-	844	779	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	621	561	953	626	599	887	1497	-	-	1369	-	-
Mov Cap-2 Maneuver	621	561	-	626	599	-	-	-	-	-	-	-
Stage 1	860	767	-	827	767	-	-	-	-	-	-	-
Stage 2	822	730	-	830	767	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.6	0	1.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1497	-	-	-	694	1369	-	-
HCM Lane V/C Ratio	-	-	-	-	0.075	0.014	-	-
HCM Control Delay (s)	0	-	-	0	10.6	7.7	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	29	3	12	21	6	14	75	54	12	51	5
Future Vol, veh/h	3	29	3	12	21	6	14	75	54	12	51	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	36	4	15	26	8	18	94	68	15	64	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	34	0	0	40	0	0	142	110	40	189	108	31
Stage 1	-	-	-	-	-	-	46	46	-	60	60	-
Stage 2	-	-	-	-	-	-	96	64	-	129	48	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1591	-	-	1583	-	-	832	784	1037	776	786	1049
Stage 1	-	-	-	-	-	-	973	861	-	957	849	-
Stage 2	-	-	-	-	-	-	916	846	-	880	859	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1591	-	-	1583	-	-	767	774	1035	650	776	1048
Mov Cap-2 Maneuver	-	-	-	-	-	-	767	774	-	650	776	-
Stage 1	-	-	-	-	-	-	970	858	-	954	841	-
Stage 2	-	-	-	-	-	-	832	838	-	729	856	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	2.2	10.3	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	855	1591	-	-	1583	-	-	764
HCM Lane V/C Ratio	0.209	0.002	-	-	0.009	-	-	0.111
HCM Control Delay (s)	10.3	7.3	0	-	7.3	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.4

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	36	127	24	28	0	124	0	32	0	1	0
Future Vol, veh/h	1	36	127	24	28	0	124	0	32	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	1	0	0	0	0	0
Mvmt Flow	1	40	143	27	31	0	139	0	36	0	1	0
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	8	8	9.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	1%	46%	0%
Vol Thru, %	0%	0%	22%	54%	100%
Vol Right, %	0%	100%	77%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	124	32	164	52	1
LT Vol	124	0	1	24	0
Through Vol	0	0	36	28	1
RT Vol	0	32	127	0	0
Lane Flow Rate	139	36	184	58	1
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.215	0.043	0.203	0.075	0.001
Departure Headway (Hd)	5.557	4.334	3.975	4.647	4.745
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	649	831	905	772	754
Service Time	3.257	2.034	1.989	2.668	2.777
HCM Lane V/C Ratio	0.214	0.043	0.203	0.075	0.001
HCM Control Delay	9.8	7.2	8	8	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.8	0.1	0.8	0.2	0

Intersection	
Int Delay, s/veh	9.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	51	9	3	68	20	16	212	13	17	91	70
Future Vol, veh/h	9	51	9	3	68	20	16	212	13	17	91	70
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	10	58	10	3	77	23	18	241	15	19	103	80

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	104	0	0	83	0	0	286	208	89	321	202	95
Stage 1	-	-	-	-	-	-	98	98	-	99	99	-
Stage 2	-	-	-	-	-	-	188	110	-	222	103	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.16	6.52	6.43	7.1	6.56	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.1	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.1	5.56	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.554	4.018	3.507	3.5	4.054	3.3
Pot Cap-1 Maneuver	1500	-	-	1527	-	-	658	689	914	636	687	967
Stage 1	-	-	-	-	-	-	899	814	-	912	805	-
Stage 2	-	-	-	-	-	-	805	804	-	785	802	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1494	-	-	1505	-	-	520	670	892	441	668	961
Mov Cap-2 Maneuver	-	-	-	-	-	-	520	670	-	441	668	-
Stage 1	-	-	-	-	-	-	880	797	-	902	800	-
Stage 2	-	-	-	-	-	-	640	799	-	529	785	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.2	14.1	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	666	1494	-	-	1505	-	-	719
HCM Lane V/C Ratio	0.411	0.007	-	-	0.002	-	-	0.281
HCM Control Delay (s)	14.1	7.4	0	-	7.4	0	-	12
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2	0	-	-	0	-	-	1.2

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	30	11	1	61	39	17	80	8	33	44	15
Future Vol, veh/h	23	30	11	1	61	39	17	80	8	33	44	15
Conflicting Peds, #/hr	23	0	27	27	0	23	8	0	34	34	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	3	0	4	0	6	0	7
Mvmt Flow	28	36	13	1	73	47	20	96	10	40	53	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	143	0	0	76	0	0	268	271	104	308	254	128
Stage 1	-	-	-	-	-	-	126	126	-	122	122	-
Stage 2	-	-	-	-	-	-	142	145	-	186	132	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.54	6.2	7.16	6.5	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.54	-	6.16	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.54	-	6.16	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.036	3.3	3.554	4	3.363
Pot Cap-1 Maneuver	1452	-	-	1536	-	-	689	632	956	637	653	909
Stage 1	-	-	-	-	-	-	883	788	-	873	799	-
Stage 2	-	-	-	-	-	-	866	773	-	807	791	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1420	-	-	1497	-	-	599	590	901	513	609	882
Mov Cap-2 Maneuver	-	-	-	-	-	-	599	590	-	513	609	-
Stage 1	-	-	-	-	-	-	843	753	-	837	781	-
Stage 2	-	-	-	-	-	-	784	755	-	660	755	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.7	0.1	12.5	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	607	1420	-	-	1497	-	-	599
HCM Lane V/C Ratio	0.208	0.02	-	-	0.001	-	-	0.185
HCM Control Delay (s)	12.5	7.6	0	-	7.4	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0	-	-	0.7

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	71	70	104	132	40
Future Vol, veh/h	56	71	70	104	132	40
Conflicting Peds, #/hr	2	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	100	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	0	0	3	3	8
Mvmt Flow	62	79	78	116	147	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	421	156	147	0	-	0
Stage 1	147	-	-	-	-	-
Stage 2	274	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	585	895	1447	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	553	887	1447	-	-	-
Mov Cap-2 Maneuver	553	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	768	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	11.4		3.1		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1447	-	700	-	-
HCM Lane V/C Ratio	0.054	-	0.202	-	-
HCM Control Delay (s)	7.6	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

APPENDIX F- TECHNICAL MEMORANDUM #6: FUTURE TRAFFIC FORECAST

FUTURE TRAFFIC FORECAST

DATE: September 2, 2020

TO: Project Management Team

FROM: Carl Springer, Kevin Chewuk, and Rochelle Starrett | DKS Associates

SUBJECT: Newport Transportation System Plan

Future Traffic Forecast (Task 4.3; Technical Memo #6) Project #17081-007

Future forecasting is an important step in the transportation planning process and provides estimates of future travel demand. This memorandum documents the forecasting methodology and results associated with the travel demand model developed by ODOT for the Newport area. The Newport model was used to develop study intersection turn movement volumes for the 2040 TSP horizon year.

INTRODUCTION

Forecasted traffic volumes were developed using the latest Newport model for 30th highest hour volume conditions in 2040. The Newport Travel Demand Model was utilized as the primary tool to estimate future travel demand in Newport, with refined travel demand forecasts developed for the City by incorporating local circulation characteristics in the travel demand model. Future year 2040 baseline motor vehicle volumes were developed and post-processed using National Cooperative Highway Research Program (NCHRP) Report 765 guidelines. The resulting volumes will be used in the future traffic operations analysis.

A summary of the Newport Travel Demand Model is provided in the following sections, including a discussion of the roadway network and land use assumptions included in the model. In addition, the model "post-processing" is described and the future traffic volumes are presented.

NEWPORT TRAVEL DEMAND MODEL

The Oregon Department of Transportation (ODOT) has recently developed and will maintain a travel demand model that estimates daily and p.m. peak hour demand for the existing year (2018) and future year (2040) transportation system. The travel demand model includes the Newport Urban Growth Boundary (UGB) (refer to Figures later in this document).

These models include two key structures that help estimate future traffic:

- Transportation Analysis Zones (TAZs)

The model area is split into internal regional TAZs and external zones. Each internal TAZ represents a small subarea of the model with unique land use attributes that represent the number of households and the number and type of employees within the zone. These land use attributes determine the intensity and directionality of trips generated by the zone. The TAZ structure for Newport can be seen in Figures later in this document. Approximately 156 TAZ's represent the Newport area.

- Transportation Network

  The model includes a network of links that generally represents the major transportation system (typically collector roads and above) in the model area. Each link is coded with attributes (e.g., speed and capacity) that approximate the function of existing roadways (for the base year and future year) and programmed roadway improvements (committed funding identified) for the future year. Each TAZ is connected to links in the model at points representing where travelers access the roadway network.

FUTURE TRANSPORTATION NETWORK

There are no regionally significant transportation improvements included in the 2040 travel demand model in the Newport area. The purpose of this model is to create a "committed" system that represents the conditions and needs of the future system without including any unfunded improvements.

LAND USE DEVELOPMENT

Land use is a crucial factor in forecasting future transportation demand. The amount of land that is to be developed, the type and scale (housing units or number of employees) of the land uses, and how the land uses are arranged within the model area has a direct impact on the future system.

Before beginning the future forecasting process, existing year (2018) and future year (2040) summer and average weekday land use was developed from prior work[1] to support development of the travel demand models. A control total for population and a control target for employment was established for Newport in both 2018 and 2040 based on projections developed by Portland State University[2], the Economic Opportunities Analysis[3], and QCEW data provided by the State of Oregon. A household control target was estimated for both 2018 and 2040 using data provided by the Census. The control totals and targets established for the average weekday land use scenario for Newport are summarized below in Table 1.

---

[1] DKS previously developed 2010 and 2040 land use for Newport as part of the initial model development effort in 2011, although the developed land use was not used to develop a full model at that time.

[2] Population Research Center Portland State University. *Coordinated Population Forecast for Lincoln County, its Urban Growth Boundaries, and Area Outside UGBs 2017-2067.* 2017.

[3] ECONorthwest. *Newport Commercial and Industrial Buildable Lands Inventory and Economic Opportunities Analysis.* 2012.

TABLE 1: NEWPORT LAND USE CONTROL TOTALS AND TARGETS (AVERAGE WEEKDAY)

NEWPORT AREA*	EXISTING (2018)	FUTURE (2040)	TOTAL GROWTH	PERCENT GROWTH
POPULATION	10,909	13,241	2,332	21%
HOUSEHOLDS	4,660	5,656	996	21%
EMPLOYEES	11,321	13,535	2,214	20%

The 2018 land use was developed from the previous 2010 land use. The total number of new households was identified using aerials and a list of recent developments compiled by the City; the total number of households was converted to a population estimate using the previously established average household size for each zone. Newport's household and population estimates are the same for both the summer and average weekday land use scenarios. The total number of employees for each zone was also grown to 2018 using an assumed 1% annual growth rate and compared to 2017 QCEW data to estimate current employment for the average weekday land use scenario. Average weekday employment was converted to summer employment using the same ratio of summer to average weekday employment as in the 2010 land use. City staff reviewed and provided feedback on this land use scenario to ensure the household, population, and employment numbers match local conditions.

The 2040 land use was developed from the previous 2040 land use. The future land use was compared with base year 2018 land use to identify zones with high employment or household growth to flag these zones for additional review. Zones with high household growth were reviewed against the residential buildable lands inventory and a list of pending residential developments provided by the City. Zones with high employment growth were also reviewed against the employment buildable lands inventory, recent developments which could spur further growth, or other large employers. The total employment was generally distributed to each employment type using the same distribution as in 2018 unless there was no previous employment in the zone or an expected significant change in employment type. City staff provided additional review of the 2040 land use scenarios to ensure the land use projections match their desired growth patterns.

Due to the importance of seasonal tourism on the Oregon Coast, the number of visiting households was also estimated as a model input. The City of Newport has previously surveyed their total number of short-term housing units in 2016 and 2019 which was assumed to represent the total number of visiting household units in 2018. Average weekday occupancy data from a 2010 survey and an assumed summer occupancy rate of 90% was used to convert the total number of units to visiting households. The average annual growth in visiting households between the 2010 and 2018 land use was used to project visiting household totals for 2040 although the total number of visiting households was capped in proportion to the total available units. Zoning information and City input was also used to identify any future hotel developments which could add to the stock of visiting household units for Newport. Both 2018 and 2040 visiting households were distributed to each TAZ using the existing distribution of visiting households for each zone and modified based on City input.

FUTURE GROWTH AREAS

The Newport model generally uses household and employment information as a basis for estimating future transportation activity. Various types of employment are associated with different types of origin-destination intensities and patterns in the p.m. peak hour. For example, TAZs with large employment numbers may generate a heavy outbound travel movement, sending trips toward TAZs with more households. Conversely, TAZs with numerous retail employees may attract trips in the p.m. peak hour. Table 2 summarizes how households and employment are assumed to change between the 2018 base year and 2040.

As shown in Table 2, the population, number of permanent households and number of visiting households within the Newport area is projected to increase by up to 21 percent from 2018 to 2040. Overall, employment in Newport is expected to increase up to 24 percent from 2018.

TABLE 2: NEWPORT MODEL LAND USE CHANGES (2018-2040)

NEWPORT AREA*		EXISTING (2018)	FUTURE (2040)	TOTAL GROWTH	PERCENT GROWTH
POPULATION	Average Weekday Summer	11,345	13,730	2,385	21%
PERMANENT HOUSEHOLDS	Average Weekday Summer	5,037	6,040	1,003	20%
VISITING HOUSEHOLDS	Average Weekday	1,211	1,423	212	18%
	Summer	2,605	3,098	493	19%
EMPLOYEES	Average Weekday	11,123	13,731	2,608	23%
	Summer	11,251	13,942	2,691	24%

Source: Newport Travel Demand Model

Note: * These locations are not limited to the city limits and includes 3 TAZ's outside of the Urban Growth Boundary.

The following maps summarize the change in land use in Newport between 2018 and 2040. Figures 1a to 1c show the increase in total households for each zone. High housing growth is concentrated around Newport's urban fringe including in northern Newport along US 101, Big Creek Park, Newport Middle School, in eastern Newport between US 20 and Yaquina Bay Road, and near the Oregon Coast Community College.

Figures 2a to 2c show the average weekday and Figures 3a to 3c show the summer increase in total employment for each zone within Newport. High employment growth is concentrated near Avery Street, the Lincoln County Fairgrounds, the Port of Newport, the South Beach area, Oregon Coast Community College, the Newport Airport, and the Holiday Beach area for both the summer and average weekday land use scenarios. Moderate employment growth is also expected along US 101 and in Newport’s downtown area.

FIGURE 1A: HOUSEHOLD GROWTH (NORTH) (2018 – 2040)

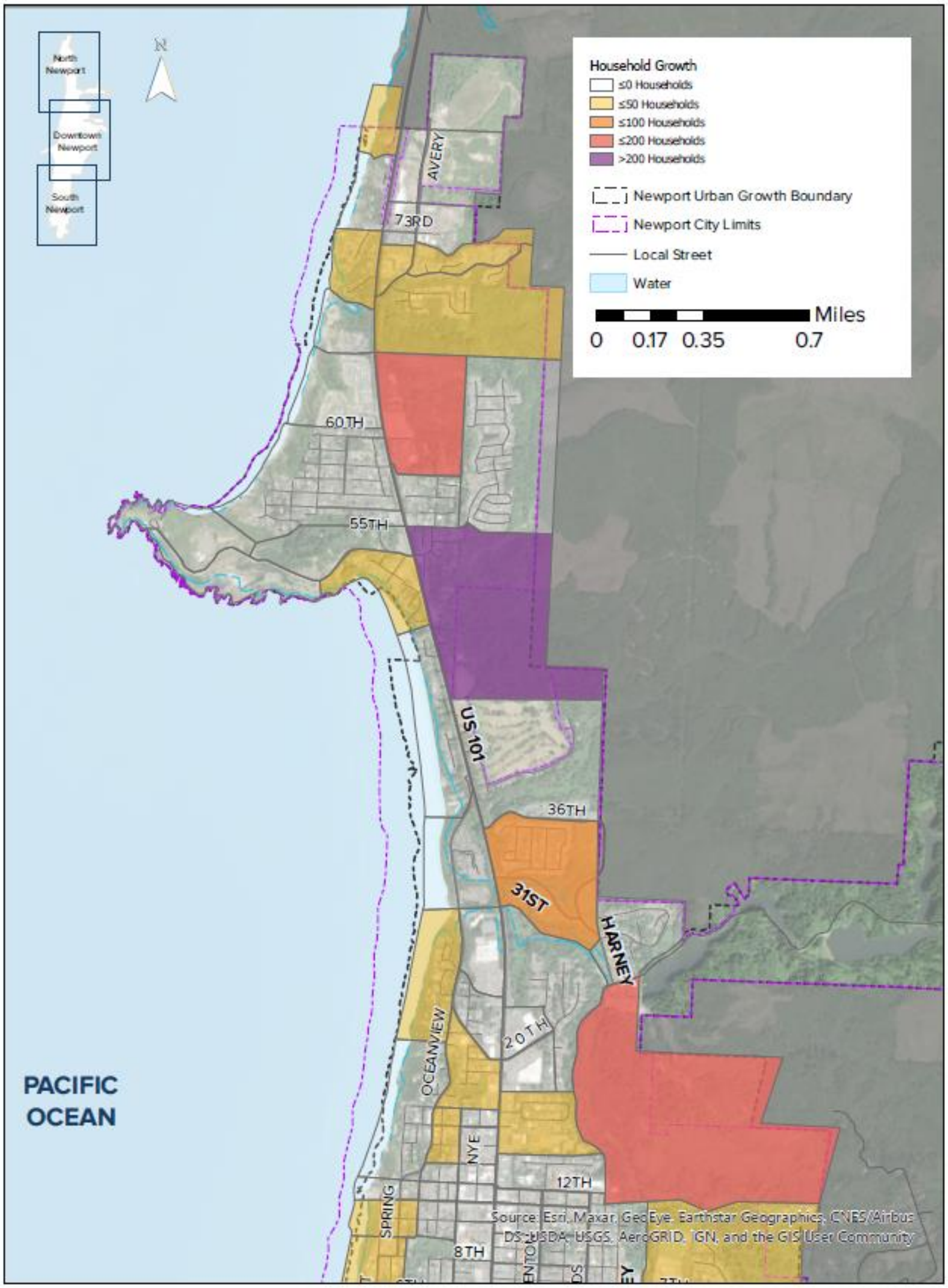


FIGURE 1B: HOUSEHOLD GROWTH (DOWNTOWN) (2018 – 2040)

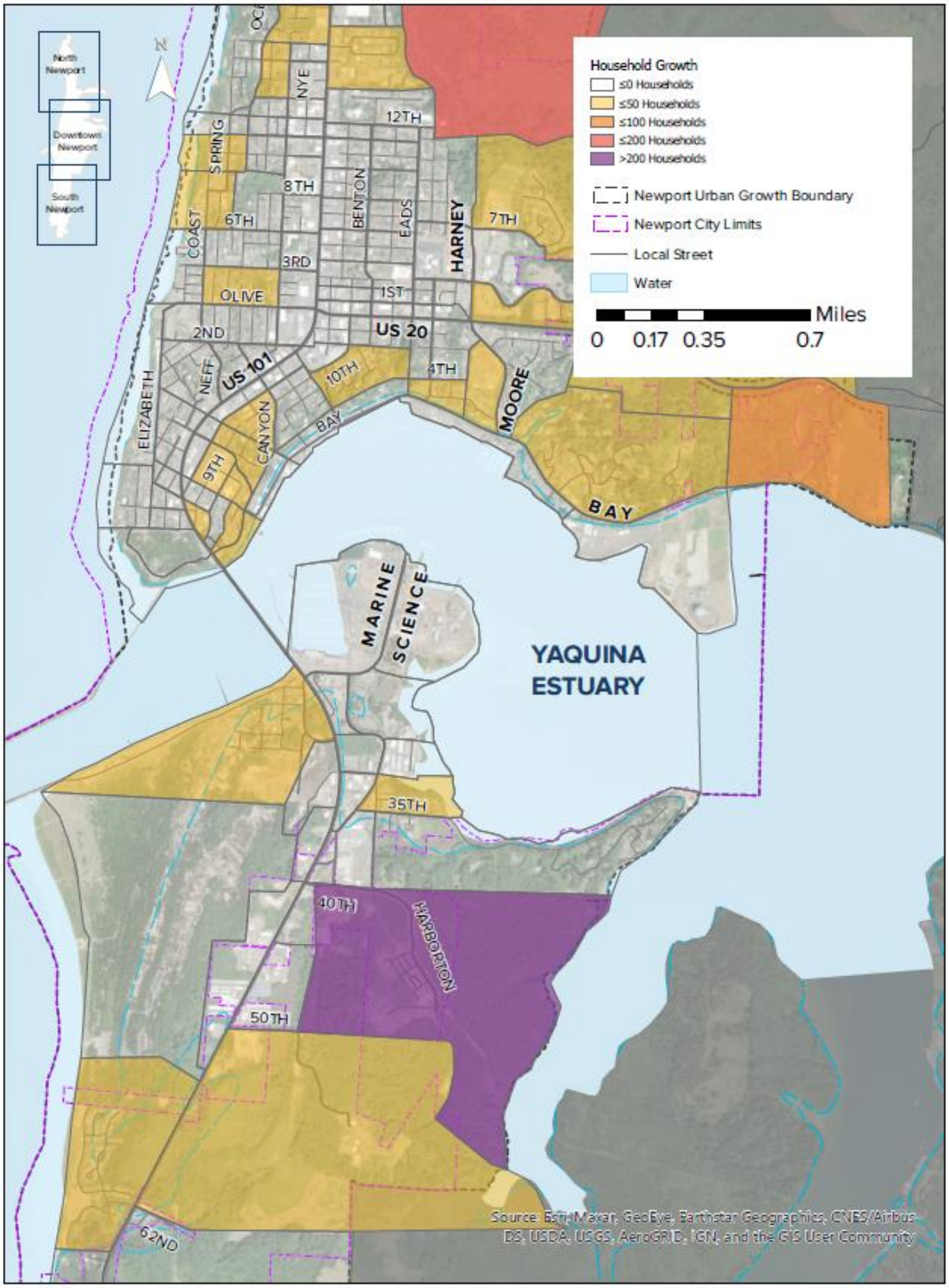


FIGURE 1C: HOUSEHOLD GROWTH (SOUTH) (2018 – 2040)

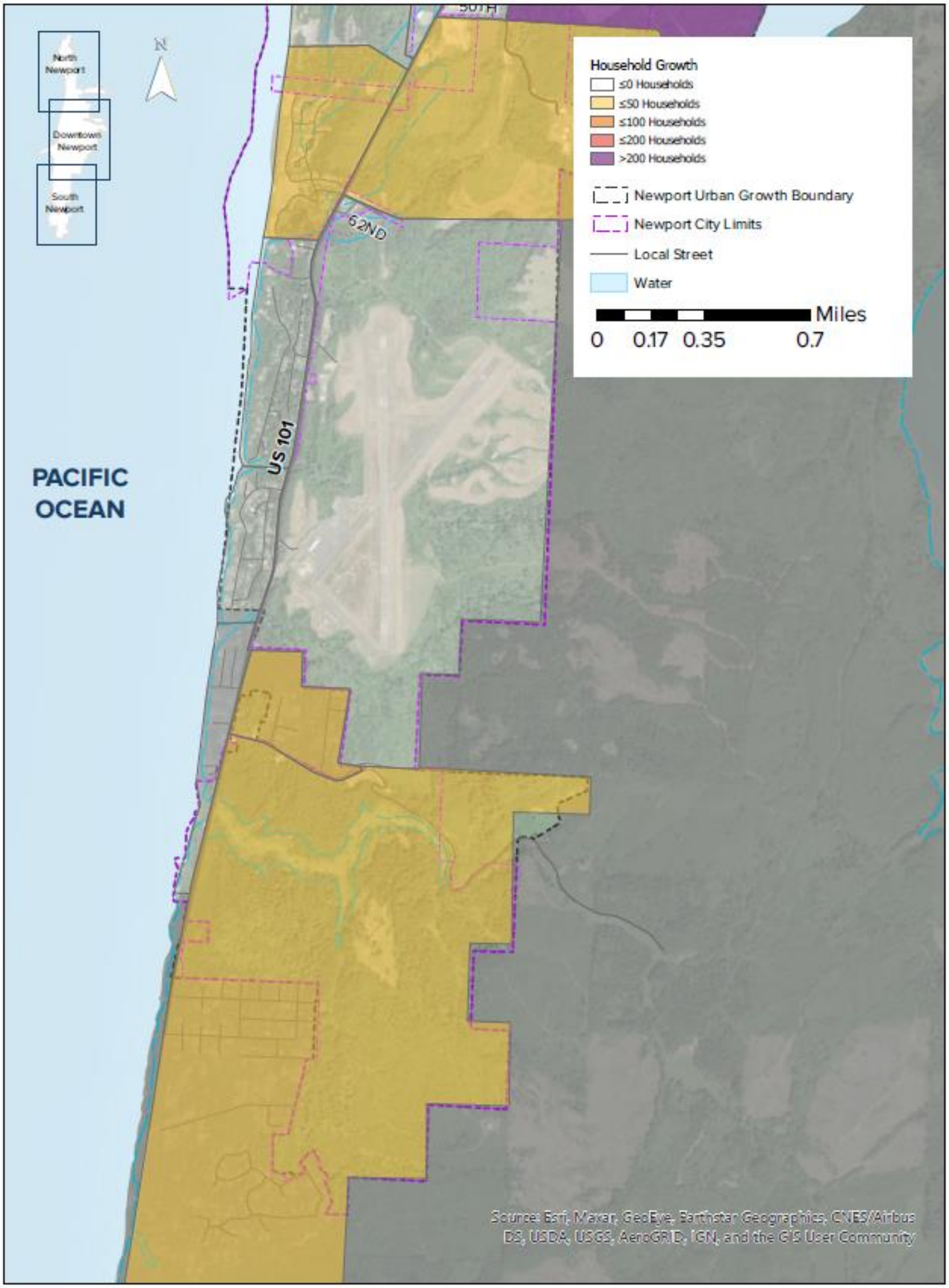


FIGURE 2A: AVERAGE WEEKDAY EMPLOYMENT GROWTH (NORTH) (2018 – 2040)

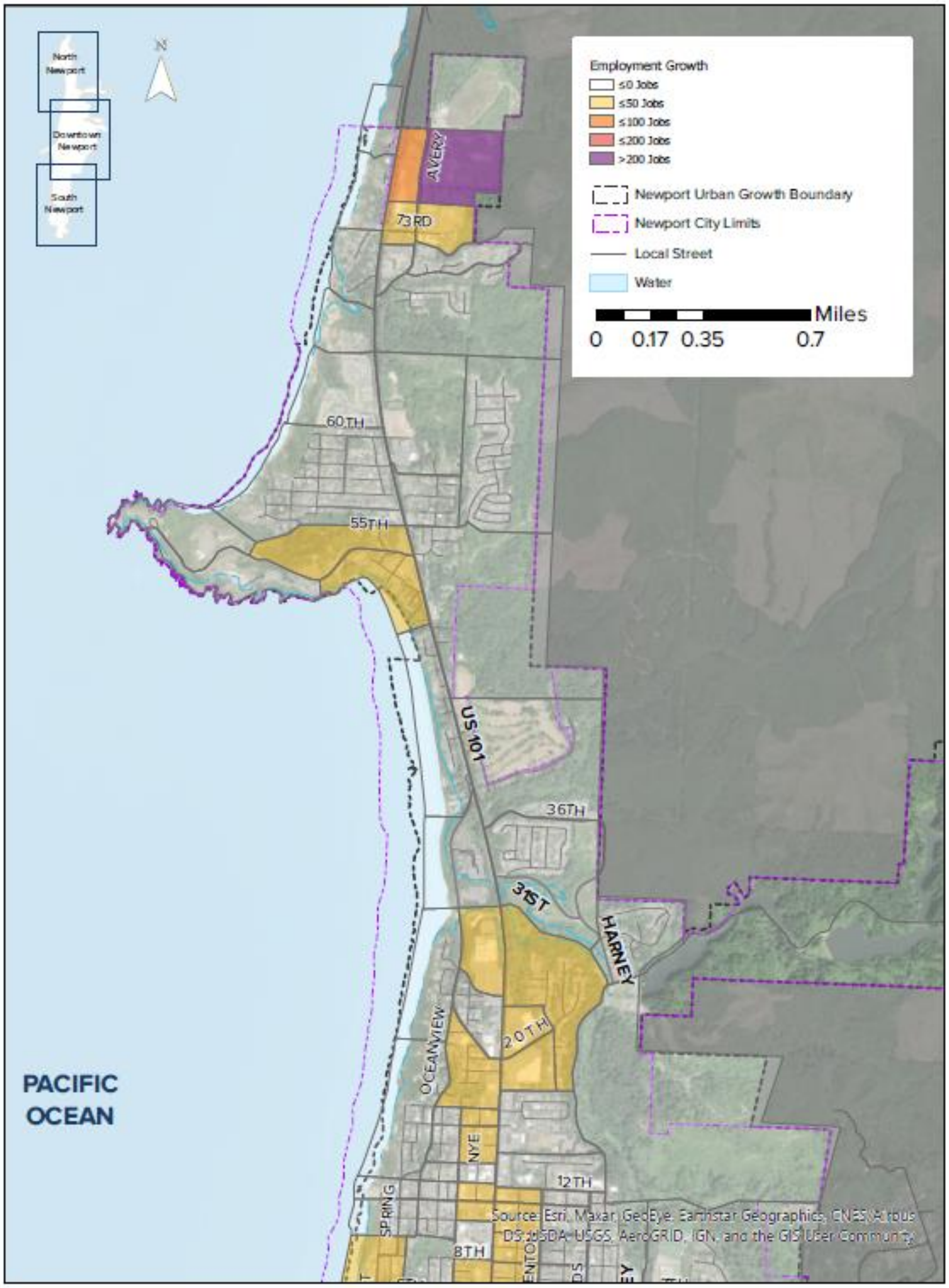


FIGURE 2B: AVERAGE WEEKDAY EMPLOYMENT GROWTH (DOWNTOWN) (2018 – 2040)

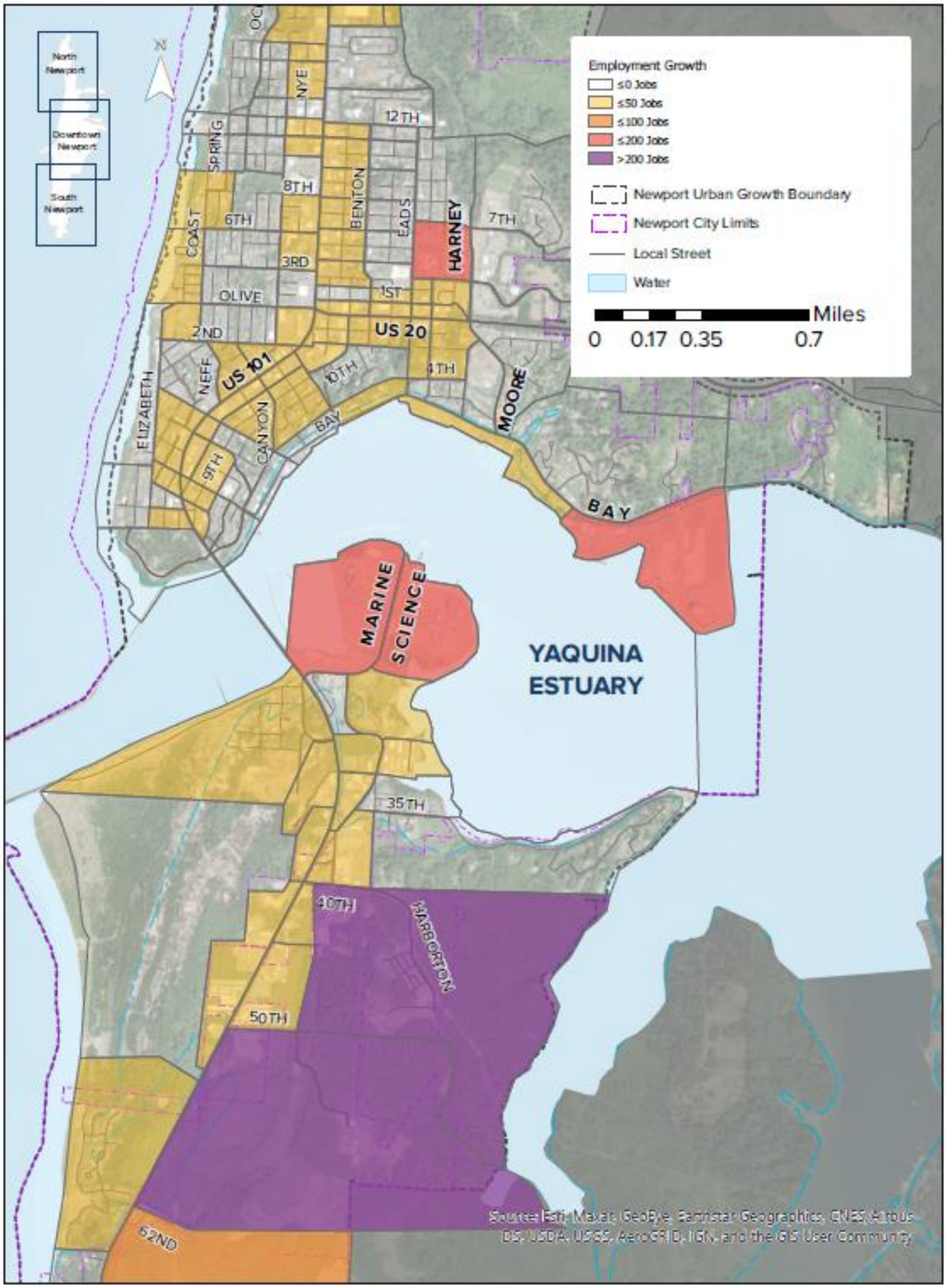


FIGURE 2C: AVERAGE WEEKDAY EMPLOYMENT GROWTH (SOUTH) (2018 – 2040)

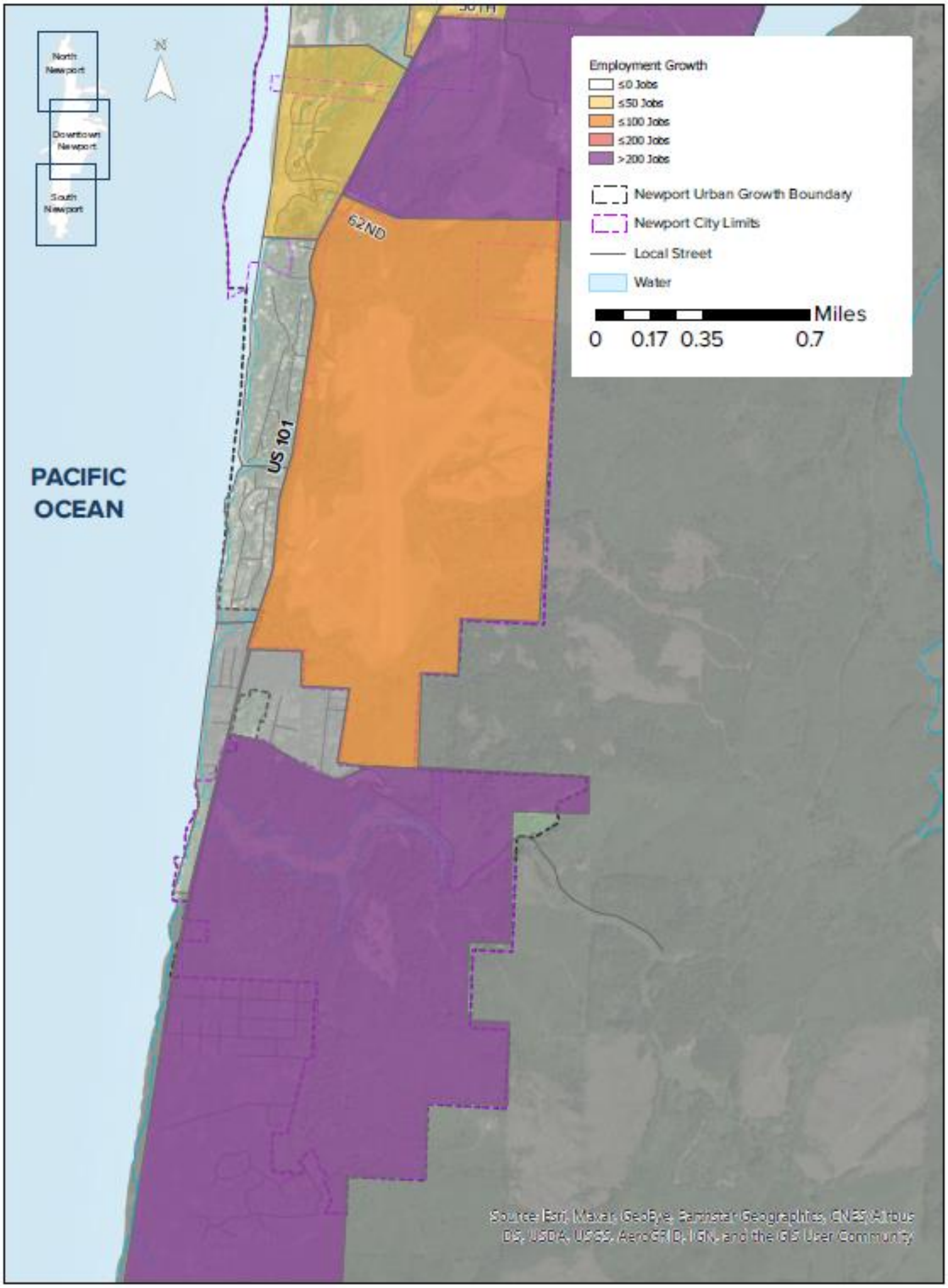


FIGURE 3A: SUMMER EMPLOYMENT GROWTH (NORTH) (2018 – 2040)

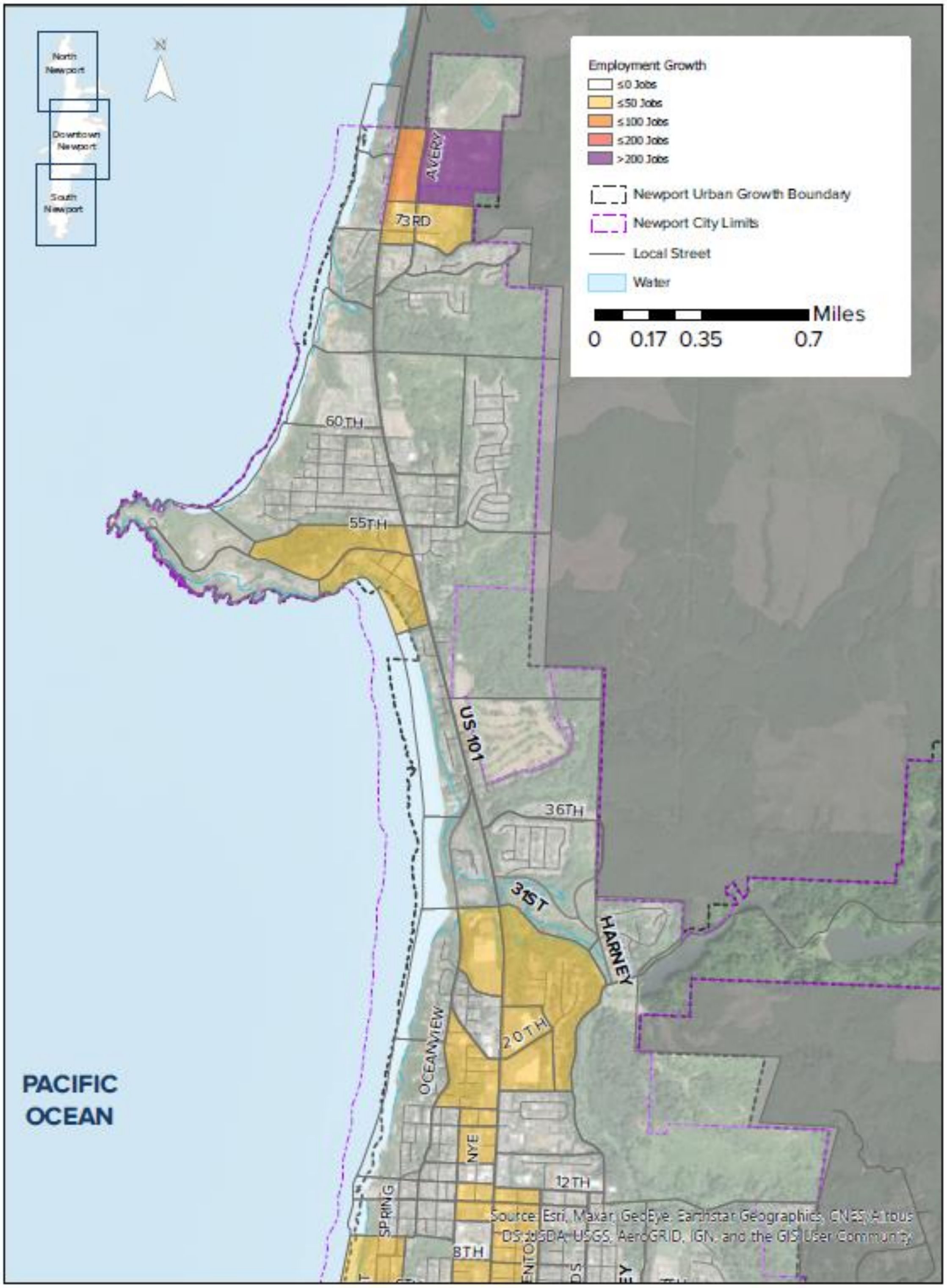


FIGURE 3B: SUMMER EMPLOYMENT GROWTH (DOWNTOWN) (2018 – 2040)

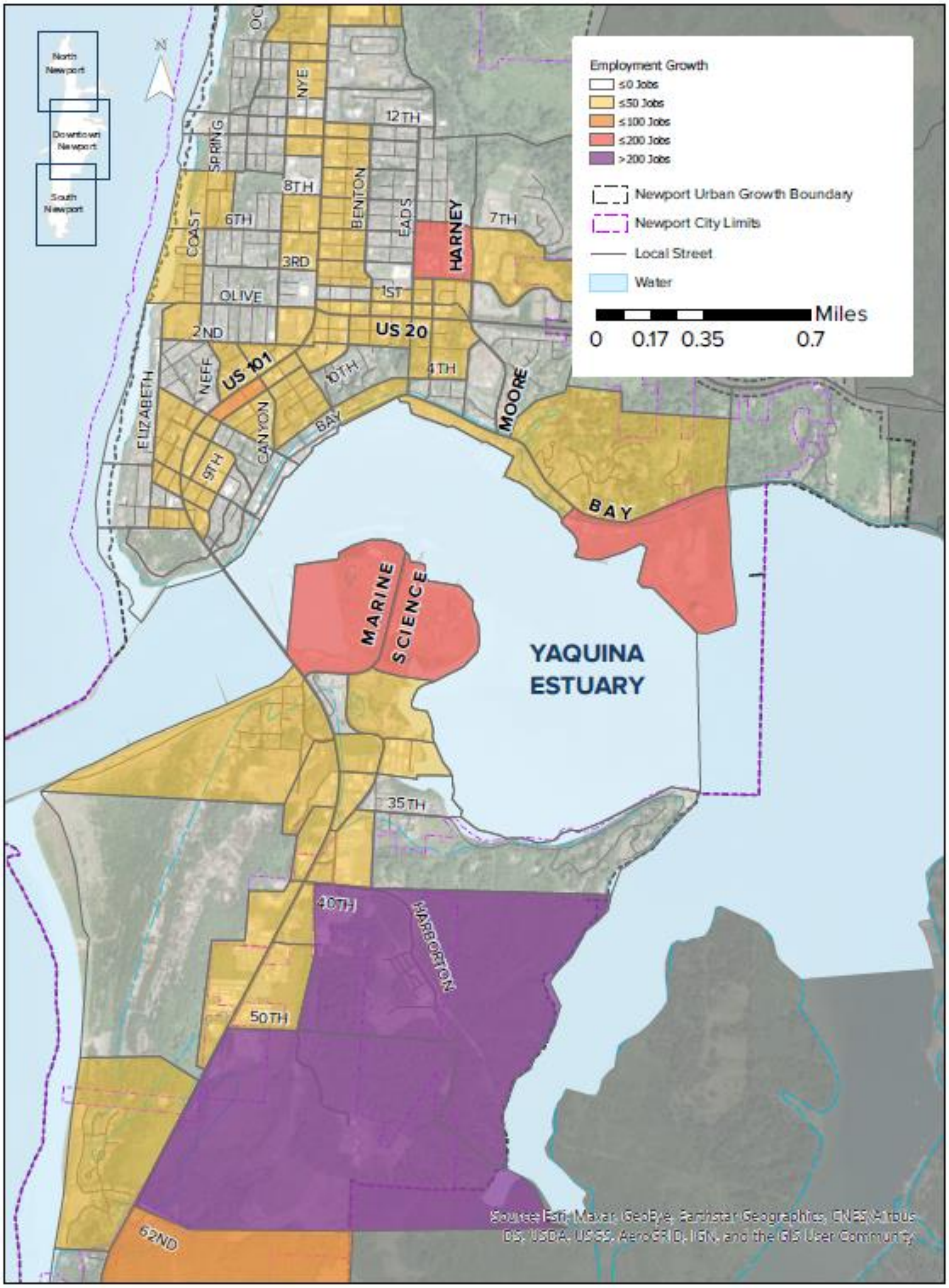
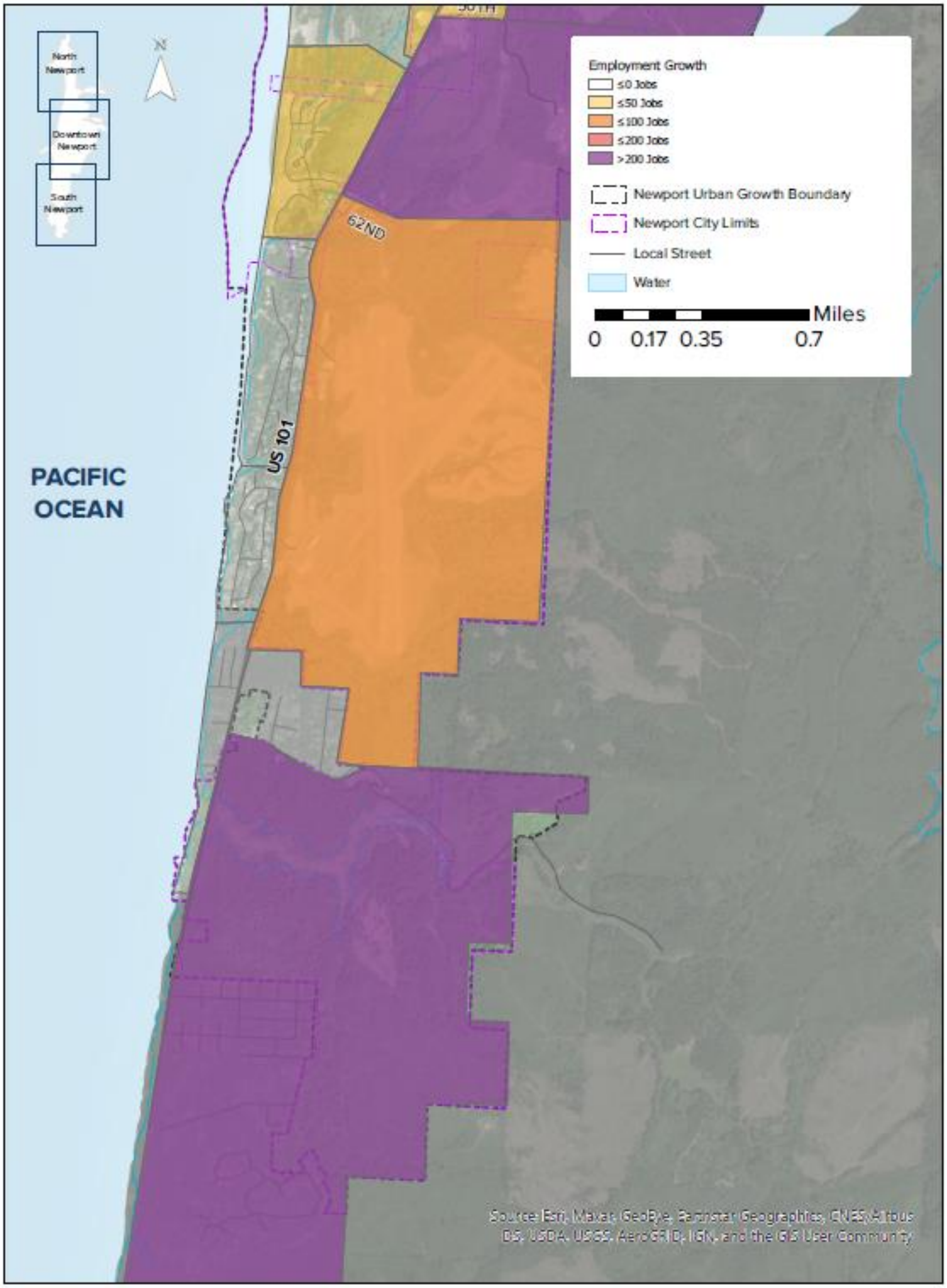


FIGURE 3C: SUMMER EMPLOYMENT GROWTH (SOUTH) (2018 – 2040)



TRAVEL DEMAND

The model's trip generation process calculates the total number of trips per TAZ. This was done for each TAZ based on the existing and projected land uses described previously in the Future Growth Areas section of this memorandum. The trips are separated into different types (home-to-work, home-to-shopping, etc.).

The increase in the number of households and employees in the model area increases the overall number of trips generated. Table 3 summarizes the total p.m. peak hour motor vehicle trip ends for the Newport area for year 2018 and year 2040. The number of vehicle trips is expected to grow by approximately 27 percent between 2018 and 2040 if the land develops according to the modeled land use assumptions. This is generally consistent with the projected population and land use increases.

TABLE 3: VEHICLE TRIP GENERATION (PM PEAK HOUR)

PERIOD*	2018 TRIP ENDS	2040 TRIP ENDS	TRIP END GROWTH	PERCENT GROWTH
AVERAGE WEEKDAY	5,713	7,248	1,535	27%
SUMMER	6,640	8,438	1,798	27%

Source: Newport Travel Demand Model

Note: * These locations are not limited to the city limits and include surrounding unincorporated areas to provide location context.

TRIP DISTRIBUTION

The trip distribution step estimates trips between origins and destinations. The model uses various factors to decide on the destination for each trip produced (started) in the TAZ. For example, home-based shopping trips produced near a downtown shopping area will choose the downtown shopping area destination over a similar shopping area in a different town due to shorter travel times.

Travel demand projections estimate the number of three distinct types of trips:

- **External-External (E-E) Trips** do not have an origin or destination in Newport and do not stop while passing through the Newport UGB. These are through traffic trips that enter or exit the city via one of the major gateways, including US 20 to the east or US 101 to the north or south.
- **Internal-External (I-E) Trips** originate in Newport and travel to a location outside of the Newport UGB, and **External-Internal (E-I) Trips** originate outside of the Newport UGB and travel to a location within Newport.
- **Internal-Internal (I-I) Trips** travel from one location within the Newport UGB to another location within the UGB.

Table 4 shows the destination for trips entering Newport at the three major gateways during the 2040 p.m. peak hour, including US 20 to the east and US 101 to the north or south. Most of the traffic entering the city ends within the city (external-internal trips), with at least 59 percent of trips from each gateway. For trips entering via US 20, about 29 percent are external-external trips and travel through the city and exit via US 101 to the north (14 percent) or south (15 percent). For trips entering via US 101 at the north end of the city, about 40 percent are external-external trips and travel through the city and exit via US 101 to the south (26 percent) or US 20 to the east (14 percent). For trips entering via US 101 at the south end of the city, about 41 percent are external-external trips and travel through the city and exit via US 101 to the north (24 percent) or US 20 to the east (17 percent).

TABLE 4: TRIP DESTINATION SUMMARY BY GATEWAYS IN NEWPORT (2040 PM PEAK HOUR)

TRIP BEGINNING	TOTAL ENTERING TRIPS	TRIP ENDING (BY % OF TRIPS ENTERING AT GATEWAY)			
		WITHIN NEWPORT	US 20- EAST GATEWAY	US 101- NORTH GATEWAY	US 101- SOUTH GATEWAY
US 20- EAST GATEWAY	878	71%	-	14%	15%
US 101- NORTH GATEWAY	571	60%	14%	-	26%
US 101- SOUTH GATEWAY	563	59%	17%	24%	-

Source: Newport Travel Demand Model

Table 5 shows the origination of trips exiting Newport at the three major gateways during the 2040 p.m. peak hour, including US 20 to the east and US 101 to the north or south. Most of the traffic exiting the city begins within the city (internal-external trips), representing at least 60 percent of trips exiting at each gateway. For trips exiting via US 20, about 28 percent are external-external trips and travel through the city and enter via US 101 to the north (13 percent) or south (15 percent). For trips exiting via US 101 at the north end of the city, about 40 percent are external-external trips and travel through the city and enter via US 101 to the south (21 percent) or US 20 to the east (19 percent). For trips exiting via US 101 at the south end of the city, about 40 percent are external-external trips and travel through the city and enter via US 101 to the north (21 percent) or US 20 to the east (19 percent).

TABLE 5: TRIP ORIGINATION SUMMARY BY GATEWAYS IN NEWPORT (2040 PM PEAK HOUR)

TRIP ENDING	TOTAL EXITING TRIPS	TRIP BEGINNING (BY % OF TRIPS EXITING AT GATEWAY)			
		WITHIN NEWPORT	US 20- EAST GATEWAY	US 101- NORTH GATEWAY	US 101- SOUTH GATEWAY
US 20- EAST GATEWAY	652	72%	-	13%	15%
US 101- NORTH GATEWAY	624	60%	19%	-	21%
US 101- SOUTH GATEWAY	688	60%	19%	21%	-

Source: Newport Travel Demand Model

MOTOR VEHICLE TRAFFIC ASSIGNMENT

In this modeling process, motor vehicle trips from one zone to another are assigned to specific travel routes in the network. The resulting trip volumes are accumulated on links of the network until all trips are assigned. The route on which a trip is assigned generally depends on whether it offers the shortest travel time among all possible routes, given all the other trips on the network. Figures 4a and 4b shows the p.m. peak hour growth in trips along regional corridors between 2018 and 2040 for both the average weekday and the summer (thicker lines correlate to higher p.m. peak hour trip growth). The most significant increases are along the primary regional state facilities: US 20 and US 101. Other routes with notable growth include Bay Boulevard, Yaquina Bay Road, and various roadways that parallel US 20 or US 101.

FIGURE 4A: AVERAGE WEEKDAY PM PEAK HOUR TRIP GROWTH (2018 – 2040)

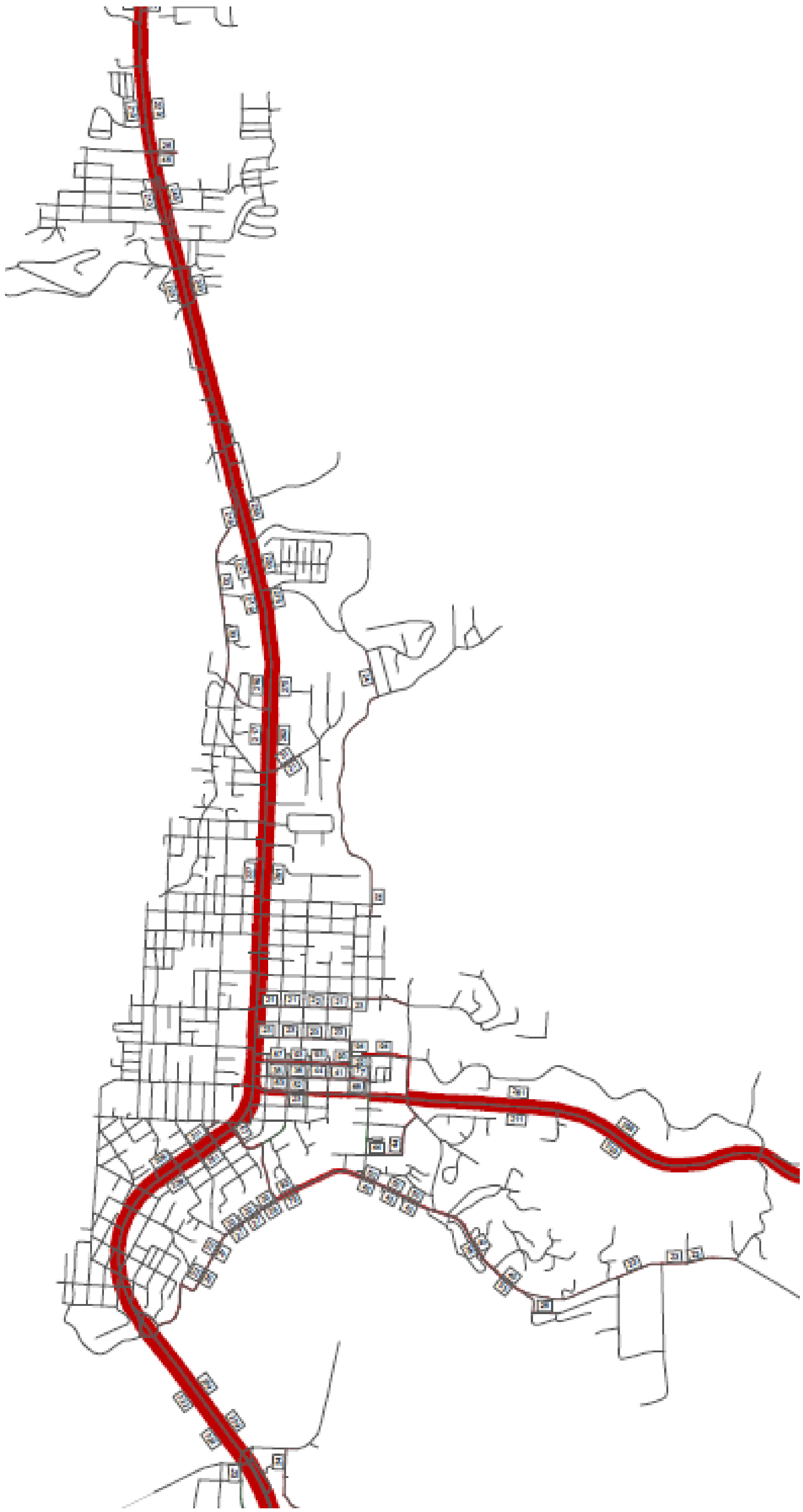


FIGURE 4B: SUMMER PM PEAK HOUR TRIP GROWTH (2018 – 2040)

POST PROCESSING AND MODEL APPLICATION TO NEWPORT

The year 2018 and year 2040 model and assignments were prepared and provided by ODOT. Limited additional minor network refinements were applied during the forecasting process to add detail to account for local connectivity and circulation patterns, particularly in the vicinity of study intersections. Adding the new network detail helps refine local circulation within the Newport area without affecting routing in the model. Modifications include:

- Closed Big Creek Road to northbound motor vehicle traffic (Fogarty Street to Harney Street)
- Increased speed on Moore Drive to 30 mph (US 20 to Bay Boulevard)

PM peak hour model volumes were extracted from the model for both the base year (2018) and forecast year (2040) scenarios. A "post processing" technique following NCHRP 765 Methodology was utilized to refine model travel forecasts to the volume forecasts presented in Table 6 and Table 7. Post processing is the application of manual adjustments to existing count data and model projections to minimize potential model error and bias.

TABLE 6: 2040 TRAFFIC VOLUMES (AVERAGE WEEKDAY)

			Northbound			Southbound			Eastbound			Westbound		
N/S	**E/W**	**#**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Study Intersections														
US 101	NE 73rd St	1	2	735	50	20	570	2	1	0	5	90	0	15
US 101	NE 52nd St	2	45	915	130	30	720	25	30	5	75	85	0	15
US 101	NW Oceanview Dr	3	20	1015	0	0	835	45	85	0	30	0	0	0
US 101	NE 36th St	4	0	1000	35	10	840	0	0	0	0	20	0	15
US 101	NE 31st St	5	0	1025	85	15	845	0	0	0	0	30	0	10
US 101	NE 20th St	6	50	1145	95	65	910	15	35	45	70	265	25	75
US 101	NE 11th St	7	10	1290	15	15	1215	20	65	15	20	25	10	45
US 101	NE 6th St	8	30	1255	20	20	1190	25	75	30	25	75	15	35
US 101	US 20	9	60	825	205	330	870	70	170	170	25	220	140	250
US 101	SW Angle St	10	10	950	10	45	1015	45	10	15	15	10	10	105
US 101	SW Hurbert St	11	20	845	10	40	965	20	35	20	30	60	35	40
US 101	Bayley St	12	25	1015	10	5	1080	15	10	0	50	10	0	25
US 20	SE Benton St	13	15	2	150	5	5	35	10	655	45	110	550	5
US 20	SE Moore Dr	14	90	60	65	135	55	35	45	725	115	60	500	135
NW Oceanview Dr	NW 25th St	15	0	85	70	15	75	0	0	0	0	35	0	35
NW Nye St	NW 11th St	16	15	70	45	10	45	5	2	25	2	10	20	5
NE Harney St	NE 7th St	17	105	0	30	0	1	0	1	45	115	20	35	0
SW 9th St	SW Hurbert St	18	15	180	15	15	80	60	10	45	10	2	60	20
SW 9th St	SW Abbey St	19	15	70	10	30	40	15	20	30	10	1	55	35
SE Moore Dr	SE Bay Blvd	20	95	95	0	0	120	40	50	0	85	0	0	0

TABLE 7: 2040 TRAFFIC VOLUMES (DHV)

			Northbound			Southbound			Eastbound			Westbound		
N/S	E/W	#	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Study Intersections														
US 101	NE 73rd St	1	5	885	60	20	690	2	1	0	5	95	0	15
US 101	NE 52nd St	2	55	1080	120	30	850	30	35	5	90	95	0	15
US 101	NW Oceanview Dr	3	20	1150	0	0	970	55	130	0	60	0	0	0
US 101	NE 36th St	4	0	1085	40	10	995	0	0	0	0	25	0	15
US 101	NE 31st St	5	0	1115	90	20	995	0	0	0	0	35	0	10
US 101	NE 20th St	6	60	1325	115	80	1075	20	40	55	80	325	30	90
US 101	NE 11th St	7	10	1500	15	15	1445	25	75	15	25	30	10	50
US 101	NE 6th St	8	35	1445	25	25	1400	30	90	35	30	75	20	35
US 101	US 20	9	75	900	215	335	975	80	205	195	35	255	165	280
US 101	SW Angle St	10	10	1080	15	60	1135	55	15	20	20	10	10	120
US 101	SW Hurbert St	11	20	965	10	45	1080	20	40	25	35	70	40	45
US 101	Bayley St	12	25	1110	10	10	1195	20	15	0	60	10	0	30
US 20	SE Benton St	13	20	5	210	5	10	40	15	695	45	120	625	5
US 20	SE Moore Dr	14	125	80	75	175	65	40	60	835	135	75	570	195
NW Oceanview Dr	NW 25th St	15	0	110	100	20	90	0	0	0	0	80	0	70
NW Nye St	NW 11th St	16	15	100	55	15	60	5	5	30	5	15	25	10
NE Harney St	NE 7th St	17	125	0	35	0	1	0	1	40	135	25	30	0
SW 9th St	SW Hurbert St	18	20	215	15	20	100	70	10	55	10	5	70	20
SW 9th St	SW Abbey St	19	20	80	10	40	45	15	25	35	15	1	75	45
SE Moore Dr	SE Bay Blvd	20	145	160	0	0	155	110	65	0	100	0	0	0

APPENDIX G- TECHNICAL MEMORANDUM #7: FUTURE TRANSPORTATION CONDITIONS AND NEEDS

FUTURE TRANSPORTATION CONDITIONS AND NEEDS

DATE: September 2, 2020

TO: Project Management Team

FROM: Carl Springer, Kevin Chewuk, and Rochelle Starrett | DKS Associates

SUBJECT: Newport Transportation System Plan — Project #17081-007

Future Transportation Conditions and Needs |
(Task 4.5; Technical Memo #7)

The condition of Newport's future transportation system depends on the growth in population, visitors, and employment; future travel patterns (*e.g.* choice of modes, routes, and frequency of trips); and community investment decisions. Growth in population, visitors, and the number of jobs is forecast based on trends and knowledge of the city and region. Future travel patterns are more difficult to predict as the community's investment decisions and the economy can have significant effect on choice of modes and routes. The objective of the transportation planning process is to generate information necessary for making decisions that will result in safe and efficient travel options through 2040.

SUMMARY OF 2040 SYSTEM NEEDS

The 2040 baseline analysis identifies how Newport's transportation system is expected to operate with additional residents, businesses, and visitors. These conditions were assessed based on the forecasted increase in trips generated by future transportation growth without any new investments in the transportation infrastructure. This analysis describes where the transportation system will perform satisfactorily and identifies areas that will likely be congested without additional investments. Subsequent memos will explore solutions for addressing future transportation system needs, including an analysis of alternative routes to the highway.

The most significant increases in traffic volumes are expected along the primary regional state facilities: US 20 and US 101. Increased traffic volumes on these state facilities is primarily driven by increased regional through traffic, which is expected to increase by over 50% through 2040. However, growth in traffic volumes will also be driven by new developments on the periphery of Newport where US 101 and US 20 serve as the only connection to retail and employment opportunities within Newport's core. As traffic volumes grow, traffic on adjacent local streets may increase as traffic seeks to avoid delay on US 101 and US 20 where parallel routes are available.

Overall, average daily traffic is forecast to increase nearly 30% during typical weekday traffic conditions and nearly 25% during peak summer traffic conditions on US 101 in downtown Newport. Average daily traffic is also forecast to increase up to 13% on US 20. Other routes with notable growth include Bay Boulevard, Yaquina Bay Road, and various roadways that parallel US 20 or US 101. For more detail on the travel forecasting process, refer to Technical Memorandum #6.

VEHICLE TRANSPORTATION SYSTEM NEEDS

Traffic volumes are forecast to increase by 2040 in Newport with most of the growth concentrated on US 101 and US 20. This growth will increase congestion on these key corridors during peak summer and average weekday conditions. Key identified needs include:

- Limited capacity at the following study intersections:
  - US 101/NE 73rd Street
  - US 101/NE 52nd Street
  - US 101/NW Oceanview Drive
  - US 101/US 20
  - US 101/ SW Angle Street
  - US 101/SW Hurbert Street
  - US 20/SE Benton Street
  - US 20/SE Moore Drive
- High delay for left turning traffic to or from US 101 and US 20 during the summer peak
- Limited alternatives to US 101 for north-south vehicle traffic in Newport, including:
  - Between SW Naterlin Drive and SW Abalone Street (Yaquina Bay Bridge)
  - Between NE 12th Street and NE 52nd Street (Northbound traffic only)
  - Between NW Oceanview Drive and NE 52nd Street (Southbound traffic only)
  - South of SE 42nd Street

PEDESTRIAN AND BICYCLE TRANSPORTATION SYSTEM NEEDS

Newport will continue to expand their existing pedestrian and bicycle networks through 2040; new developments, programmed investments, and an urban renewal district will help to expand Newport's future multimodal network. However, the historical built environment in much of Newport has created many significant sidewalk gaps that will likely remain through 2040. Key identified needs carried forward from the existing conditions analysis include:

- Sidewalk infill along Newport's arterial and collector streets
- ADA upgrades at intersections and accessible paths to the ultimate destination
- Safe crossing opportunities on US 101 and US 20

- Parallel routes or facility upgrades in locations where US 101 is the primary north-south route and a significant barrier for pedestrians (*e.g.* Yaquina Bay Bridge, between NW 25th Street and Agate Beach) including for areas that are expected to see new development through 2040

- Safety enhancements for NW Oceanview Drive

Much of Newport's arterial and collector street system provides a safe and comfortable experience for cyclists even without dedicated facilities due to low traffic volumes. However, new facilities can enhance the connectivity of Newport's bicycle network. Key identified needs include:

- New bike facilities (*e.g.* on-street bike lanes or separated multi-use pathways) or identified parallel routes for US 101 and US 20

- Safe crossing opportunities on US 101 and US 20

- Parallel routes or facility upgrades in locations where US 101 is the primary north-south route and a significant barrier for bicyclists (*e.g.* Yaquina Bay Bridge) including for areas that are expected to see new development through 2040

- Safety enhancements for NW Oceanview Drive

SNAPSHOT OF NEWPORT IN 2040

RISING POPULATION AND EMPLOYMENT

Today, Newport is home to over 4,600 households and accounts for over 11,300 jobs. Between now and 2040, both the number of households and employees is forecast to grow by 20 percent. Newport will have 5,600 households and about 13,500 jobs[1] by 2040. Summer tourism is also expected to continue to draw Oregonians to Newport for day trips or longer visits. With more residents, visitors, and employees in Newport, the transportation network will face increasing demand through 2040.

Housing growth is concentrated in Newport's urban fringe to the north, east, and south near the Oregon Coast Community College. Limited residential infill is also expected throughout the city. High employment growth is concentrated near Avery Street, the Lincoln County Fairgrounds, the Port of Newport, the South Beach area, Oregon Coast Community College, the Newport Airport, and the Holiday Beach area. Moderate employment growth is also expected along US 101 and in Newport's downtown area.

[1] Based on Newport Travel Demand Model land use data – note that these totals are based on boundaries approximated by the TAZs, which may not match current or future City limits (see Technical Memorandum #6: Future Traffic Forecast).

MORE TRAVEL

With more jobs, residents, visitors, and through travel, the street network in Newport must accommodate an additional 1,800 motor vehicle trips during the summer weekday evening design hour[2] and another 1,500 motor vehicle trips during average weekday evening traffic conditions. Today, the Newport street network is generally able to tolerate the extent of delay per current ODOT standards at most locations; however, limited local street connectivity through Newport will translate to high growth on both US 101 and US 20. Higher vehicle volumes along US 101 and US 20 will increase the left turn delay for side streets and further increase congestion. A detailed review of future travel patterns for Newport is provided in Technical Memorandum #6.

2040 motor vehicle volumes for design hour conditions were utilized to determine areas on the baseline roadway network that will be congested and may require future investments or alternate mobility targets to accommodate forecasted growth. The 2040 baseline motor vehicle volumes for study intersections in the appendix show volumes are anticipated to be highest along US 101, which connects Newport to other coastal communities and is a key tourist route.

FUTURE TRAVEL ESTIMATES

Future traffic volumes were developed using Newport's 2040 Travel Demand Models. Future vehicle travel patterns and forecast traffic volumes for each study intersection are documented in Technical Memorandum #6.

FUTURE ESTIMATES OF WALKING, BIKING, AND TRANSIT

Commute mode choice, traffic counts, and land use can all be used to identify locations in Newport where current residents might bike, walk, or take transit which, in turn, informs the future travel demand for these modes. Between 2014 and 2018, 68% of Newport residents drove to work alone while 16% of workers carpooled. Only 7% of Newport residents walked to work while less than 2% of residents took transit or biked to work[3]. The existing commute mode share will likely remain unchanged without future investments in multimodal infrastructure.

Existing traffic counts show pedestrian activity is highest near downtown Newport roughly between SW Bayley Street, SW 9th Street, US 101/W Olive Street, and SW Nye Street/SW 7th Street, and over 90 pedestrians were recorded at the intersection of SW 9th Street and SW Abbey Street during the PM peak hour[4]. Moderate pedestrian demand (*i.e.* over 10 observed pedestrians per hour) is present throughout much of Newport's residential adjacent to downtown although pedestrian

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[2] The future "design hour" is equivalent to the 30th highest annual hour analyzed under existing conditions which occurs in the summer.

[3] US Census. *Commuting Characteristics by Sex,* 2018. https://data.census.gov/cedsci/table?q=commute&tid=ACSST5Y2018.S0801&vintage=2018&hidePreview=true&moe=false&g=1600000US4152450

[4] Traffic counts collected July 11, 2019 as part of the TSP update.

demand drops significantly north of 20th Street. Bicycle volumes were low (less than 5 recorded bikes per hour for a given direction) at all study intersections. Outside of the downtown area, both the Nye Beach and Historic Bayfront areas are expected to generate significant pedestrian and bicyclist demand based on their existing land use.

Most housing growth is concentrated near the northern (*i.e.* north of N 20th Street) periphery of Newport, the eastern periphery of Newport, Big Creek Park, or the Oregon Coast Community College. Employment growth is concentrated around NE 73rd Street/NE Avery Street, the Lincoln County Fairgrounds, the Port of Newport, South Beach, the Oregon Coast Community College, and on Newport's southern periphery with only moderate employment growth near downtown Newport. Much of the forecasted growth is planned for areas with limited existing pedestrian and bicycle facilities. While new development will include enhancements to existing facilities, connectivity gaps between Newport's historical downtown and high-growth areas will remain, particularly for developments in northern Newport, eastern Newport, and the South Beach area where north-south travel is concentrated on highways with limited multimodal facilities. The inadequate walking and biking infrastructure further hinders transit riders, as these users typically utilize these facilities at the beginning and end of their trip.

2040 TRANSPORTATION SYSTEM NEEDS

Review of the expected growth throughout the City and existing gaps and deficiencies of the transportation system identified the following locations as possible candidates for improvements.

MOTOR VEHICLE NEEDS

Study intersection operations were analyzed for 2040 using the methodology outlined in the existing conditions memo[5]. Forecasted intersection operations were compared to applicable agency mobility targets to identify where significant congestion is likely to occur. Table 1, below, shows the study intersections that do not meet mobility targets under the 2040 design hour conditions[6]. A complete listing of operating conditions at study intersections is provided in the appendix.

Of the 20 study intersections, eight will not meet their respective mobility target during the 2040 design hour conditions. Nineteen of the study intersections met their mobility targets under existing conditions (2020); the intersection of US 101/US 20 is the only intersection that exceeded its mobility target under existing PM peak hour conditions[5]. All of the substandard intersections are on state highways. Half of the study intersections that exceed their mobility target are two-way

[5] DKS Associates. Technical Memorandum #5: Existing Conditions. April 8, 2020.

[6] The future "design hour" is equivalent to the 30th highest annual hour analyzed under existing conditions which corresponds to summer traffic conditions for Newport. This is a common time period applied for design purposes and corresponds with adopted mobility targets.

stop control intersections. Increased traffic on US 101 will lead to excessive delay for left-turning traffic by 2040 at all unsignalized intersections, particularly during the summer peak.

TABLE 1: STUDY INTERSECTIONS THAT DO NOT MEET MOBILITY TARGETS/ STANDARDS (2040 PM PEAK- DESIGN HOUR CONDITIONS)

#	Study Intersection	Mobility Target	Volume/ Capacity Ratio	Delay (secs)	Level of Service
1	US 101/73rd (stop controlled on side street)	Highway Approaches 0.80 v/c; Side Street Approaches 0.95 v/c	0.55/ 1.57	13/ 405	B/ F
2	US 101/52nd (signalized)	0.80 v/c	0.89*	57.2	E
3	US 101/Oceanview (stop controlled on side street)	Highway Approaches 0.80 v/c; Side Street Approaches 0.95 v/c	0.72/ 1.12	11/ 157	B/ F
9	US 101/US 20 (signalized)	0.85 v/c	0.99	69.2	E
10	US 101/Angle (stop controlled on side street)	Highway Approaches 0.90 v/c; Side Street Approaches 0.95 v/c	0.49/ 2.63	12/ 1093	B/ F
11	US 101/Hurbert (signalized)	0.90 v/c	0.90	48.5	D
13	US 20/Benton (stop controlled on side street)	Highway Approaches 0.85 v/c; Side Street Approaches 0.95 v/c	0.46/ 1.05	10/ 118	B/ F
14	US 20/Moore (signalized)	0.85 v/c	0.85	30.5	C

*Reported using HCM 2000

Note: At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

Considering the amount of congestion forecast for some study intersections, it may be found impractical to mitigate them sufficiently to comply with adopted mobility targets. This could be true for a variety of reasons, such as the project costs to reduce congestion or resulting undesirable impacts to the environment or other modes of travel from a project to reduce congestion. In such situations, adoption of "alternative" mobility targets that allow for higher levels of congestion, in balance with other objectives, may be considered.

A common approach to developing alternative mobility targets is to change the standard analysis parameters used or the time period to which the targets apply from the design hour[7] to an average weekday, which better represents traffic volumes experienced throughout the majority of the year.

[7] On state highways in Newport, the design hour volume occurs during the summer season when traffic volumes can be as much as 17 percent higher than typical weekday peaks hours.

In consideration of the possible need for alternative mobility targets, the analysis of study intersection operations was repeated under an average weekday condition. Study intersections that do not meet mobility targets under average weekday PM peak hour conditions in 2040 are summarized in Table 2.

Two intersections that fail to meet mobility targets during the design hour continue to do so during the average weekday, although the degree of congestion experienced is smaller. Six intersections (US 101/73rd, US 101/52nd, US 101/Oceanview, US 101/Hurbert, US 20/Benton, and US 20/Moore) that are substandard under 2040 design hour conditions are not under average weekday PM peak hour conditions. A complete listing of average weekday operating conditions at all study intersections is provided in the appendix.

TABLE 2: STUDY INTERSECTIONS THAT DO NOT MEET MOBILITY TARGETS/ STANDARDS (2040 PM PEAK- AVERAGE WEEKDAY CONDITIONS)

#	Study Intersection	Mobility Target	Volume/ Capacity Ratio	Delay (secs)	Level of Service
9	US 101/US 20 (signalized)	0.85 v/c	0.91	52.8	D
10	US 101/Angle (stop controlled on side street)	Highway Approaches 0.90 v/c; Side Street Approaches 0.95 v/c	0.41/1.24	11/377	B/F

Note: At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

YAQUINA BAY BRIDGE

The Yaquina Bay Bridge is a key constraint for vehicles travelling north-south in Newport both today and in the future. Existing narrow travel lanes, lack of shoulders, and a steep grade all contribute to a capacity that is reduced by up to 25% when compared to similar highway segments[8]. The forecasted traffic volumes, summarized below in Table 3, are expected to exceed the capacity of the Yaquina Bay Bridge for both 2040 scenarios based on the projected land use. As traffic volumes grow, this congestion could impact segments of US 101 approaching the Yaquina Bay Bridge or lead to additional congestion in off-peak hours without any mitigations.

[8] Newport Transportation System Plan, 2012.

TABLE 3: EXPECTED GROWTH IN TRAFFIC VOLUMES ON THE YAQUINA BAY BRIDGE

Scenario	2018 Average Daily Traffic	2040 Average Daily Traffic	Percent Growth
AVERAGE WEEKDAY	14,200	19,800	39%
SUMMER	16,900	21,800	28%

Like many coastal bridges, the Yaquina Bay Bridge is a designated historic structure. The ODOT Historic Bridge Preservation Plan[9] details treatment options to extend the useful life of historic structures and maintain their original purpose. ODOT ensures that every reasonable effort is pursued to maintain transportation service for their historic bridges prior to other, more impactful decisions. The existing historic structural elements will be maintained to the maximum extent necessary, and any new elements must maintain the historical significance of the structure. Maintenance considerations could also include vehicle or load restrictions that limit traffic on historic bridges.

If in the future, ODOT determines that the Yaquina Bay Bridge can no longer maintain its intended function, the bridge could be paired with a parallel crossing to lessen vehicle demands or converted to a new use. Only after these options are exhausted will ODOT consider a full closure of the bridge. All future decisions regarding the use of the Yaquina Bay Bridge will be coordinated with ODOT.

PEDESTRIAN NETWORK NEEDS

The following section describes the walking network needs identified for the 2040 Baseline street network.

FUTURE WALKING NETWORK

The percent of roadways with sidewalks, seen below in Figure 1, is not expected to change noticeably from existing conditions. Nearly 70% of streets in Newport lack sidewalks on both sides. While around 36% of Newport's collector and arterial streets have sidewalks on at least one side, only 7% of local streets have sidewalks on at least one side. These numbers do not incorporate Newport's 9.5 miles of off-street trails that also serve pedestrian travel.

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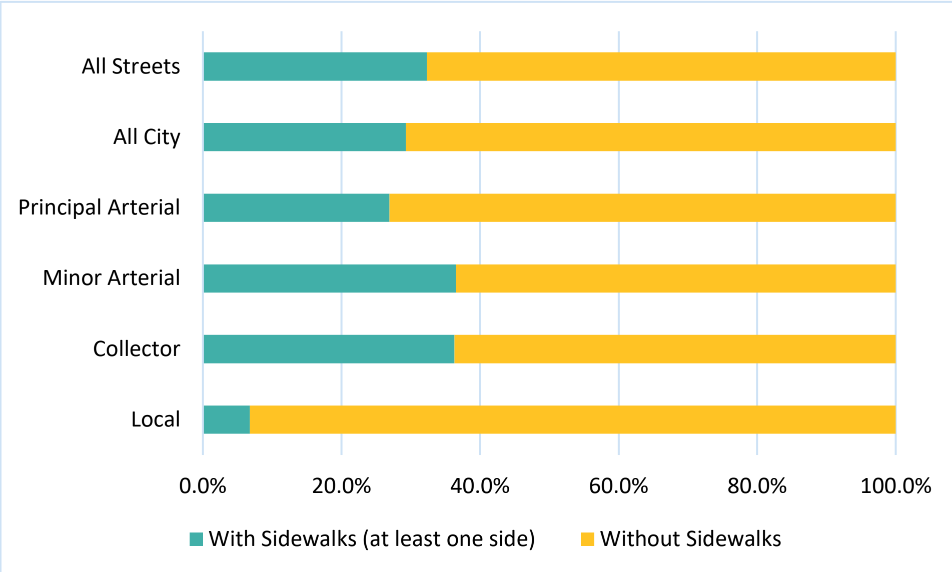
[9] ODOT. *Historic Bridge Preservation Plan.* 2007.

FIGURE 1: PERCENT OF STREET MILES WITH SIDEWALKS IN NEWPORT



Identified pedestrian improvements expected to be complete by 2040 include:

- Sidewalk improvements on SW Harbor Way
- New sidewalk on US 101 in South Beach near SE 35th Street

FUTURE PEDESTRIAN LEVEL OF TRAFFIC STRESS (LTS)

The Pedestrian LTS assessment shows the extent to which the walking network on collector and arterial streets provides a level of comfort and safety for users. Locations rated as low or moderate stress (LTS 1 or 2) provide a safe and comfortable walking experience while locations rated as high or moderate stress (LTS 3 or 4) provide a less comfortable walking experience. The assessment method and conditions of the pedestrian network are summarized in a previous memo[10]. Since traffic volume is the only input factor anticipated to change significantly under future conditions, there were no changes made to the Pedestrian LTS evaluation identified in existing conditions (see Technical Memo #5).

About one-quarter of the collector and arterial street miles in Newport rate as low or moderate stress (LTS 1 or 2) for pedestrians. However, 60 percent of the collector and arterial street miles rate as extreme stress (LTS 4), largely due to lack of existing sidewalks. Overall, the pedestrian network continues to rate relatively high near downtown, and poor towards the edges of the City and in residential areas without sidewalks.

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[10] DKS Associates. Technical Memorandum #5: Existing Conditions. April 8, 2020.

WALKING FACILITY GAPS

Although there is generally good sidewalk coverage near downtown Newport, many of the residential areas of Newport were developed without sidewalks, and these sidewalk gaps remain. Completing selected segments on arterial and collector roadways, identified below, can create a more comprehensive pedestrian network. This list does not identify road segments where sidewalks are only provided on one side of the street which could still present a barrier to pedestrian travel.

- SW Harbor Way, SW 13th Street to SW 11th Street (City of Newport)
- SE 2nd Street, SE Benton Street to SE Coos Street (City of Newport)
- SE Coos Street, SE 2nd Street to US 20 (City of Newport)
- SW Bayley Street, SW 8th Street to SW Elizabeth Street (City of Newport)
- SW Elizabeth Street, SW Bayley Street to SW Park Street (City of Newport)
- SW 7th Street, SW Bayley Street to SW Alder Street (City of Newport)
- SW Abbey Street, US 101 to SW 6th Street (City of Newport)
- SW 2nd Street, SW Elizabeth Street to SW Cliff Street (City of Newport)
- NW 6th Street, NW Nye Street to NW Coast Street (City of Newport)
- NW Nye Street, NW 3rd Street to NW 6th Street (City of Newport)
- NW Nye Street, NW 7th Street to NW 8th Street (City of Newport)
- NW Nye Street, NW 10th Street to NW 16th Street (City of Newport)
- NW 8th Street, NW Coast Street to NW Spring Street (City of Newport)
- NW Spring Street, NW 8th Street to NW 12th Street (City of Newport)
- NW 11th Street, NW Spring Street to NW Lake Street (City of Newport)
- NW Oceanview Drive, NW 12th Street to US 101 (City of Newport)
- NW Edenview Way, NW 20th Street to NW Oceanview Drive (City of Newport)
- SE Coos Street, US 20 to NE 3rd Street (City of Newport)
- NE Benton Street, NE 3rd Street to NE 12th Street (City of Newport)
- NE Harney Street, US 20 to NE 3rd Street/NE Yaquina Heights Drive (City of Newport)
- NE 7th Street, Newport Middle School East Driveway to NE 6th Street (City of Newport)
- NE 20th Street, east of Fred Meyer (City of Newport)
- NE Harney Street, NE Big Creek Road to NE 31st Street (City of Newport)
- NE 36th Street, NE Harney Street to US 101 (City of Newport)
- NE Big Creek Road, NE Harney Street to NE 12th Street (City of Newport)
- NW 55th Street, US 101 to NW Rhododendron Street (City of Newport)

- NW 60th Street, US 101 to NW Biggs Street (City of Newport)
- NW Biggs Street, NW 60th Street to NW 55th Street (City of Newport)

In addition to the areas where these gaps already exist, future pedestrian infrastructure needs can be identified based on anticipated growth. Higher densities and more people require more pedestrian infrastructure to accommodate demand. Where growth is anticipated, street segments rated as high or extreme stress (LTS 3 or LTS 4) will need enhancements in order to improve their conditions. Potential treatments could include completing sidewalks on both sides of the street or widening existing sidewalks. These segments include:

- SE 40th Street, US 101 to existing shared use path (City of Newport) – complete shared use path on south side of street or consider crossing enhancements to connect to sidewalks on north side of street
- SE Ash Street, SE 40th Street to SE Ferry Slip Road (City of Newport) – complete sidewalks on east side of street and widen shared use path on west side of street as needed
- SE Ferry Slip Road, SE Ash Street to SE Chestnut Street (City of Newport) – complete sidewalks on east side of street and widen shared use path as needed
- NE 3rd Street, NE Harney Street to NE Eads Street (City of Newport) – complete sidewalks on south side of street
- NE 7th Street, NE Harney Street to 6th Street (City of Newport) – complete sidewalks on south side of street and existing gaps on north side of street
- NE Harney Street, NE 3rd Street to US 20 (City of Newport) – complete sidewalks on both sides of street
- US 101, SW Neff Way to SW Angle Street (ODOT) – install urban design features as needed to enhance the existing pedestrian space

OTHER PEDESTRIAN NEEDS

Other areas identified by the public as critical pedestrian needs are across the Yaquina Bay Bridge, along the NW Oceanview Drive corridor, the Oregon Coast Trail (including near Yaquina Head), and existing pedestrian crossings on US 101 and US 20, including previously proposed locations at US 20/NE Eads Street and near US 101/NE 60th Street. Vehicle speeds, safety, existing gaps, and poor connections are some of the top concerns for these areas. Completing the existing pedestrian system is another key step towards promoting walking as a safe and attractive option for Newport residents.

As mitigations for motor vehicle travel are considered for intersections and along roadway segments, innovative designs and/or "alternative" vehicular mobility targets that allow for higher levels of congestion may be considered to avoid undesirable impacts on pedestrian safety and connectivity.

METHODOLOGY TO ADDRESS DEFICIENCIES

A list of potential pedestrian network improvement projects will be developed in Technical Memorandum #8 based on streets with pedestrian deficiencies. A street is considered deficient for walking if it meets one or more of the following conditions:

- Arterial or collector street without pedestrian facilities.
- Extreme pedestrian stress (LTS 4) rating.
- High or extreme pedestrian stress (LTS 3 or 4) in close proximity to parks, schools, transit stops, or other important destinations.

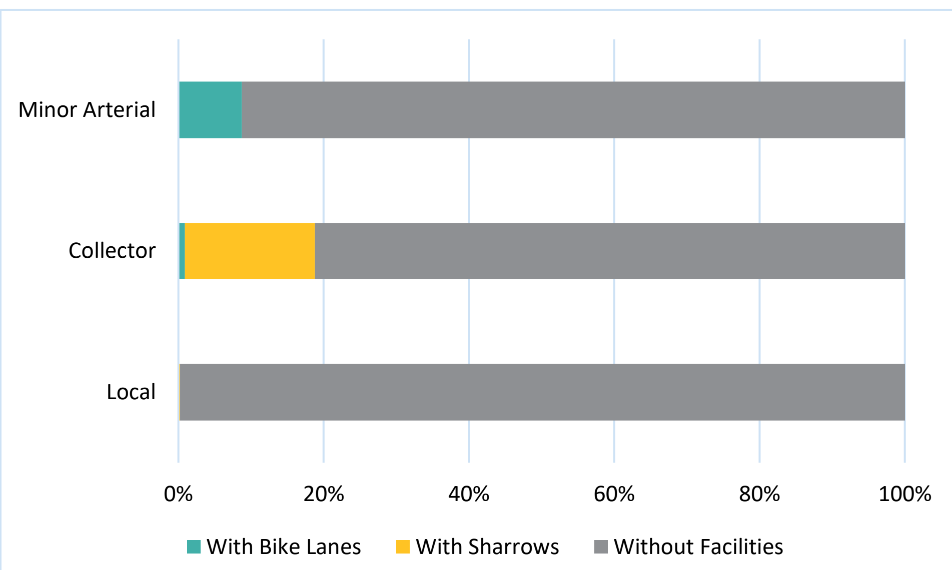
BICYCLE NETWORK NEEDS

The following section describes the bicycle network needs identified for the 2040 Baseline street network.

FUTURE BICYCLE NETWORK

The percent of roadways with bike facilities (either bike lanes or sharrows), seen below in Figure 2, will not change noticeably from existing conditions. Over 80% of Newport's collector streets and over 90% of Newport's arterial streets currently lack any bike facilities (*e.g.* bike lanes). Much of US 101 and US 20 also lack bike lanes although wider shoulders are available on US 101 north of NW 25th Street and south of SW Abalone Street which can serve a similar role for cyclists. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways and serve bicycle travel.

FIGURE 2: PERCENT OF STREET MILES WITH BIKE FACILITIES IN NEWPORT



FUTURE BICYCLE LEVEL OF TRAFFIC STRESS (LTS)

Bicycle Level of Traffic Stress measures the degree that different street characteristics are stressful to people operating a bicycle. Locations rated as low or moderate stress (LTS 1 or 2) provide a safe and comfortable cycling experience while locations rated as high or extreme stress (LTS 3 or 4) provide a less comfortable cycling experience. The assessment method and conditions of the bicycle network are summarized in a previous memo[11]. Since traffic volume is the only input factor anticipated to change significantly under future conditions, there were no changes made to the Bicycle LTS evaluation identified in existing conditions (see Technical Memo #5).

Nearly 90% of Newport's collector streets rate as low or moderate stress (LTS 1 or 2) for cyclists. While most of Newport's collector streets lack dedicated bike facilities (*e.g.* bike lanes), most of these streets are relatively low volume, creating a comfortable environment for cyclists even without dedicated facilities. Conversely, less than 15% of Newport's arterial streets rate as low or moderate stress (LTS 1 or 2) and nearly 75% of the arterial streets rate as extreme stress (LTS 4) due to the lack of bike facilities (*e.g.* bike lanes) and higher volumes, particularly on US 101 and US 20. The streets with highest stress levels are the streets important for local and regional through travel, where most businesses and services are located. These streets can also provide the only through route for cyclists (*e.g.* the Yaquina Bay Bridge).

[11] DKS Associates. Technical Memorandum #5: Existing Conditions. April 8, 2020.

BICYCLE FACILITY GAPS

Most of Newport's arterial and collector street network does not include bike facilities (*e.g.* bike lanes), and existing facilities are often not continuous. While all existing gaps should be completed, completing key gaps which can provide safe alternatives to high traffic routes for cyclists should be priority. Potential key gaps on arterial and collector street segments include:

- SW 9th Street/SW Angle Street/SW 10th Street/SE 2nd Street/SE Coos Street, US 101 to US 20 (City of Newport)
- SW Bay Boulevard, SW Bay Street to SE Moore Drive (City of Newport)
- SW Hurbert Street/SW Canyon Way, SW 2nd Street to Bay Boulevard (City of Newport)
- SE Coos Street/NE Benton Street, US 20 to NE 11th Street (City of Newport)
- NW 11th Street/NE 11th Street, NW Spring Street to NE Eads Street (City of Newport)
- NW 3rd Street/NE 11th Street, NW Coast Street to NE Eads Street (City of Newport)
- SW 7th Street, SW Elizabeth Street to SW 2nd Street (City of Newport)
- SW Bayley Street, SW Elizabeth Street to US 101 (City of Newport)
- SW 2nd Street, SW Elizabeth Street to US 101 (City of Newport)
- SW Nye Street/NW Nye Street, SW 2nd Street to NW 15th Street (City of Newport)
- SW Abalone Street, US 101 to Existing Shared Use Path (City of Newport)
- NE Harney Street, NE Big Creek Road to NE 36th Street (City of Newport)
- NE 36th Street, NE Harney Street to US 101 (City of Newport)
- US 101, NW Oceanview Drive to NE 36th Street (ODOT)
- NE Big Creek Road, NE Harney Street to NE 12th Street (City of Newport)

High stress arterial and collector roadways with existing bike facilities (*e.g.* bike lanes) are another area that should be targeted for improvements. Major street segments rated as high or extreme stress (LTS 3 or 4) for cyclists include:

- US 101 (ODOT)
- US 20 (ODOT)
- NW Oceanview Drive, US 101 to NW Edenview Way (City of Newport)
- SE Bay Boulevard, SE Moore Drive to Embarcadero Resort Driveway (City of Newport)

Several of the identified bicycle facility gaps occur in areas where high household or employment growth is expected nearby. The following segments were identified for their potential to complete a key facility gap near high growth areas, connect existing bicycle facilities that are located near high growth areas, or to increase bicyclists' comfort near high growth areas:

- SE Ferry Slip Road, SE Ash Street to SE Marine Science Drive (City of Newport) – install on-street bike facility (*e.g.* bike lanes) or enhance intersection crossings for existing multi-use path
- NE Eads Street, NE 3rd Street to NE 7th Street (City of Newport) – install on-street bike facility (*e.g.* bike lanes)
- NE 7th Street, NE Eads Street to NE Harney Street (City of Newport) – install on-street bike facility (*e.g.* bike lanes)
- NE 3rd Street, NE Eads Street to NE Harney Street (City of Newport) – install on-street bike facility (*e.g.* bike lanes)
- NE Harney Street, NE 3rd Street to US 20 (City of Newport) – install on-street bike facility (*e.g.* bike lanes)
- SE Moore Drive, US 20 to SE Bay Boulevard (City of Newport) – install on-street bike facility (*e.g.* bike lanes)

Generally, improvements are needed if the City prioritizes more bicycle friendly streets for novice riders or tourists. Such improvements would focus on improving the density and connectivity of low-stress bike routes, improving crossing opportunities for key barriers (*e.g.* US 101, US 20), and providing parallel accommodations to US 101 to improve north-south connections for Newport.

OTHER BICYCLE NEEDS

Other areas identified by the public as critical bicycle needs are across the Yaquina Bay Bridge, along the NW Oceanview Drive corridor, the Oregon Coast Bike Route, and existing bicycle crossings on US 101 and US 20. Vehicle speeds and safety are some of the top concerns for these areas. Connecting the existing bicycle system is another key step towards promoting cycling as a safe and attractive option for Newport residents. High stress barriers in the cycling network can limit interest in bicycling but providing a connected bike network creates opportunities for cyclists to travel between home and work in a safe and comfortable manner. Ideally, all of Newport's street network would create low or moderate stress for cyclists (LTS 1 or 2).

Not all of the roadways lacking bicycle facilities will be able to accommodate bike lanes due to right-of-way constraints, limited funding, and/or fewer constraints on parallel corridors. A network of low and moderate stress bikeways (LTS 1 or 2) will be considered to relieve some of the right-of-way constraints posed on streets where bikeways are high or extreme stress (LTS 3 or 4), but space does not permit consideration of bike lanes or buffered bike lanes. This could include installing enhanced bike facilities (*e.g.* bike lanes) on parallel routes to US 101 or US 20 to facilitate bicycle travel when these opportunities existing. Ideally, these parallel routes will be installed immediately adjacent to the US 101 or US 20 corridors to facilitate wayfinding and minimize out of direction travel for bicyclists. Crossing enhancements will likely be needed at locations where this proposed parallel system crosses US 101 or US 20 to protect cyclists and encourage cyclists of all ages and abilities to feel comfortable travelling within Newport.

As mitigations for motor vehicle travel are considered for intersections and along roadway segments, innovative designs and/or “alternative” vehicular mobility targets that allow for higher levels of congestion may also be considered to avoid undesirable impacts on bicycle safety and connectivity.

METHODOLOGY TO ADDRESS DEFICIENCIES

A list of potential bicycle network improvement projects will be developed in Technical Memorandum #8 based on streets with bicycle deficiencies. A street is considered deficient if it meets one or more of the following conditions:

- Arterial or collector street without bicycle facilities or adjacent corridor with bicycle facilities.
- Extreme bicycle stress (LTS 4) rating.
- High or extreme bicycle stress (LTS 3 or 4) in close proximity to parks, schools, transit stops, or other important destinations.

SAFETY NEEDS

Several locations were identified in Technical Memorandum #5 as high collision locations. With growing traffic volumes, these problematic areas likely will persist, and may even become progressively worse. These previously identified locations include:

- **US 101/52nd Street (signal):** This four-leg signalized intersection experienced 15 collisions over the five years, including 11 rear-end crashes. Rear-end crashes at this site were typically caused by a driver following too closely or failing to avoid the vehicle ahead. Most crashes at this site led to injuries (11 of 15).
- **US 101/11th Street (signal):** This is a four-leg signalized intersection; seven crashes occurred here over the five years. Two of the seven crashes involved bicyclists, caused by a driver failing to yield or disregarding the traffic signal. Both crashes led to an injury to the cyclist.
- **US 101/6th Street (signal):** This is four-leg signalized intersection with offset intersection legs for 6th Street. Two-thirds (10 of 15) of the crashes were rear-ends, primarily caused by a driver following too closely or inattention. Most of the crashes involved property damage only (9 of 15).
- **US 101/Bayley Street (Two-Way Stop Control, or TWSC):** This is a four-leg intersection with stop control on Bayley Street. A Rectangular Rapid Flashing Beacon (RRFB) is located immediately north of the intersection, along US 101, and the 9th Street/US 101 intersection is also located in close proximity which could contribute to a higher crash rate at this location. One pedestrian crash also occurred at this site over the five years caused by careless driving. Over half of the crashes resulted in injuries (10 of 14).
- **11th Street/Nye Street (TWSC):** This is a four-leg intersection with stop control on Nye Street where five crashes occurred over the five years. Both the critical crash rate and 90th percentile crash rate are exceeded at this site, in part due to the relatively low entering volume among study intersections on local streets. All crashes at this site were angle

crashes and were caused by a driver failing to yield or drivers who passed the stop sign. All five crashes resulted in property damage only.

- **Hurbert Street/9th Street (TWSC):** This is a four-leg intersection with stop control on 9th Street. The critical crash rate and 90th percentile crash rate are both exceeded at this site, likely due to the comparatively low entering volume. Additionally, this site experienced a high number of angle crashes (6 of 7) which were caused by failure to yield or vehicles passing the stop sign. Over half of the crashes (5 of 7) resulted in injuries.

- **Abbey Street/9th Street (TWSC):** This is a four-leg intersection with stop control on 9th Street. While the observed intersection crash rate is lower than the critical crash rate, this site exceeds the statewide 90th percentile crash rate. Over the past five years, all three crashes at this site were angle crashes caused by either passing the stop sign or failure to yield. Two of the crashes led to injuries and one crash resulted in property damage only.

- **Bay Boulevard/Moore Drive (TWSC):** This three-leg skewed intersection with stop control on the west leg (Bay Boulevard) had four crashes over the five years. Both the critical crash rate and 90th percentile crash rates are exceeded at this site. Half of the crashes involved turning movements, caused by either failure to yield or passing the stop sign which could be exacerbated due to the sites' geometry. This intersection was realigned to reduce some of the intersection skew between August, 2016, and July, 2019; the impacts of this geometric change cannot be assessed from the available data. Half of the crashes resulted in property damage only (2 of 4).

Additionally, the segment of US 101 between NE 52nd Street/Lighthouse Drive and US 20 was previously identified as having a crash rate over the statewide average crash rate. Crash causes on this segment reflect the dense urban land uses and are primarily categorized as failure to yield, following too closely, and failing to avoid the vehicle ahead. Most crashes (59 percent) occurred at intersections. There were five pedestrian-involved collisions and eight bicycle-involved collisions along this segment.

Additionally, according to the ODOT 2017 SPIS report (data reported between 2014 and 2016), and 2016 SPIS report (data reported between 2013 and 2015), several locations in Newport rank among the top most hazardous sections of highways in Oregon. The identified locations are listed below.

- US 101 around the N 20th Street intersection (top 10 percent segment, 2017; top 10 percent segment, 2016)

- US 101 around the N 16th Street intersection (top 10 percent segment, 2017)

- US 101 around the N 3rd Street intersection (top 10 percent segment, 2016)

- US 101 around the N 2nd Street intersection (top 10 percent segment, 2017)

- US 101 around the N 1st Street intersection (top 5 percent segment, 2017)
- US 101 around the SW Lee Street intersection (top 10 percent segment, 2016)
- US 101 around the SW Hurbert Street intersection (top 10 percent segment, 2016)
- US 101 around the SW Bayley Street intersection (top 5 percent segment, 2017)
- US 101 around the SW Bay Street intersection (top 5 percent segment, 2016)

Without targeted safety improvements, these identified safety deficiencies will likely remain through 2040. As traffic volumes growth through 2040 in Newport, additional safety deficiencies could also arise as vehicle exposure increases. Specific care should be taken at locations where high volumes of pedestrians or cyclists are expected to prioritize the safety of vulnerable road users.

FREIGHT NEEDS

With growing traffic volumes from existing conditions, six intersections along Oregon Freight Routes or Federal Truck Routes would not meet their respective mobility target/standard during the 2040 design hour conditions. These intersections are:

- US 101/73rd
- US 101/52nd
- US 101/Oceanview
- US 101/US 20
- US 20/Benton
- US 20/Moore

Although all of these intersections are on a designated freight route, three of the intersections are two-way stop control where the side street will experience significant delay in the future. Since freight traffic is concentrated on US 101 and US 20 in Newport, high side-street delay at the intersections of US 101/Oceanview and US 20/Benton will likely have a minimal impact to freight. However, 73rd Street serves an industrial area which can generate high freight traffic, and increased side street delay at this location will negatively impact freight operations. High vehicle delay at the other three traffic signals will also increase delay for freight travel through Newport on US 101 or US 20.

Other locations with identified freight needs include Bay Boulevard and the Yaquina Bay Bridge. Bay Boulevard is a working waterfront and is a key freight generator for the City of Newport. This area is also a tourist destination which can create conflicts between the high volume of pedestrians, passenger cars, and freight vehicles which serve Newport's fishing industry. Freight vehicles can also struggle to navigate the steep grades for northbound traffic approaching the Yaquina Bay Bridge. A short term project which will relocate the existing signal from SE 32nd Street to SE 35th Street is expected to improve this operational issue for freight vehicles.

TRANSIT NEEDS

Transit service for Newport is provided by Lincoln County Transit. Typical existing service characteristics are summarized below:

- Lincoln County Transit provides service to Newport which includes a city loop and inter-city transit service to Lincoln City, Siletz, Yachats, Corvallis, and Albany.
- The Newport city loop completes a full loop through Newport six times each day, seven days a week, and in the evening, there is an additional southbound run to City Hall. Key destinations within Newport served by transit include grocery stores and other shopping, restaurants, local hotels and residences, Newport City Hall, post office, Oregon Coast Aquarium, NOAA facilities, and Nye Beach. Most destinations served by transit are north of Yaquina Bay Bridge or in the South Beach area. City loop buses are wheelchair accessible with bicycle racks.
- Inter-city transit service operates routes to Corvallis and Albany four times each day, to Lincoln City four times each day, to Yachats four times each day, and to Siletz six times a day between Monday and Saturday.
- Lincoln County Transit also operates Dial-A-Ride transit in Newport between Monday and Friday.
- Most Newport residents are within a half mile of a transit stop, and in the downtown core, most residents are within a quarter mile of a transit stop.
- Limited stop amenities (including many unmarked stops) makes the transit system challenging to navigate, particularly for visitors.
- Long headways (up to 90 minutes) and limited service hours (approximately between 7 am and 5pm) for the Newport city loop transit service limits the utility of this service for residents and visitors.
- Transit service is not currently provided south of SE 50th Avenue.

Lincoln County's Transit Development Plan will guide future changes to transit service. Identified changes through 2028 include:

- Add additional stops at Newport's Walmart and Fred Meyer as part of the Newport-Siletz route

- Add up to four additional daily runs on the Coast to Valley route which serves Corvallis and Albany and coordinate these runs to better align with work or Amtrak schedules
- Increase frequency up to 50 percent on weekdays and weekends for the Newport-Lincoln City Route
- Add additional stops at the Oregon Coast Community College as part of the Newport-Yachats route
- Extend Dial-A-Ride service hours and provide service seven days a week
- Modify the Newport City Loop route to remove the Nye Beach and Bayfront and maintain existing 90 minute headways
- Add a new Newport City Loop route which serves Fred Meyer, Nye Beach, City Hall, Bayfront, and Embarcadero with 45 minute headways
- Add a new Newport City Loop route which serves Nye Beach, City Hall, Bayfront, and Embarcadero with 30 minute headways

These transit enhancements were identified by Lincoln County Transit to address the most significant unmet needs within their transit system. Further investments will be coordinated with Lincoln County Transit.

OTHER NEEDS

Other key community concerns identified include:

- Congestion around NE Harney Street/SE Moore Drive due to schools and county fairground traffic
- Limited access to the hospital from US 101
- Dangerous on-street parking on US 101 in downtown Newport due to narrow travel lanes
- Southbound vehicle speeds on US 101 approaching the Yaquina Bay Bridge as vehicles merge
- Limited access and high delay travelling to and from residential neighborhoods whose only access is from US 101, such as San-Bay-O Circle

APPENDIX

STUDY INTERSECTION OPERATIONS: 2040 PM PEAK- DESIGN HOUR CONDITIONS

#	Study Intersection	Intersection Control	Mobility Target	V/C Ratio	Delay	LOS
1	US 101/73rd	Urban 4ST	0.8/0.95	0.55/1.57	13/405	B/F
2	US 101/52nd*	Urban 4SG	0.80	0.89	57.2	E
3	US 101/Oceanview	Urban 3ST	0.8/0.95	0.72/1.12	11/157	B/F
4	US 101/36th	Urban 3ST	0.8/0.95	0.68/0.24	11/32	B/D
5	US 101/31st	Urban 3ST	0.8/0.95	0.71/0.3	12/37	B/E
6	US 101/20th*	Urban 4SG	0.90	0.88	34.1	C
7	US 101/11th	Urban 4SG	0.90	0.65	5	A
8	US 101/6th	Urban 4SG	0.90	0.81	20.4	C
9	US 101/US 20	Urban 4SG	0.85	0.99	69.2	E
10	US 101/Angle	Urban 4ST	0.90/0.95	0.49/2.63	12/1093	B/F
11	US 101/Hurbert	Urban 4SG	0.90	0.90	48.5	D
12	US 101/Bayley	Urban 4ST	0.90/0.95	0.41/0.79	13/111	B/F
13	US 20/Benton	Urban 4ST	0.85/0.95	0.46/1.05	10/118	B/F
14	US 20/Moore	Urban 4SG	0.85	0.85	30.5	C
15	Oceanview/25th	Urban 4ST	0.95/0.95	0.15/0.27	8/12	A/B
16	11th/Nye	Urban 4ST	0.95/0.95	0.04/0.26	7/11	A/B
17	Harney/7th	Urban 4ST - AWSC	0.95	0.22	9.8	A
18	Hurbert/9th	Urban 4ST	0.95/0.95	0.06/0.44	7/15	A/B
19	Abbey/9th	Urban 4ST	0.95/0.95	0.09/0.23	8/13	A/B
20	Bay/Moore	Urban 3ST	0.95/0.95	0.11/0.33	8/14	A/B

*Reported using HCM 2000 (v/c ratio only)

**Reported using HCM 2000

STUDY INTERSECTION OPERATIONS: 2040 PM PEAK- AVERAGE WEEKDAY CONDITIONS

#	Study Intersection	Intersection Control	Mobility Target	V/C Ratio	Delay	LOS
1	US 101/73rd	Urban 4ST	0.8/0.95	0.46/0.92	12/130	B/F
2	US 101/52nd*	Urban 4SG	0.80	0.78	37.3	D
3	US 101/Oceanview	Urban 3ST	0.8/0.95	0.64/0.57	10/43	B/E
4	US 101/36th	Urban 3ST	0.8/0.95	0.63/0.18	11/26	B/D
5	US 101/31st	Urban 3ST	0.8/0.95	0.66/0.22	11/29	B/D
6	US 101/20th*	Urban 4SG	0.90	0.75	31.6	C
7	US 101/11th	Urban 4SG	0.90	0.55	6.8	A
8	US 101/6th	Urban 4SG	0.90	0.71	25.3	C
9	US 101/US 20	Urban 4SG	0.85	0.91	52.8	D
10	US 101/Angle	Urban 4ST	0.90/0.95	0.41/1.24	11/377	B/F
11	US 101/Hurbert	Urban 4SG	0.90	0.79	34.7	C
12	US 101/Bayley	Urban 4ST	0.90/0.95	0.36/0.41	12/50	B/F
13	US 20/Benton	Urban 4ST	0.85/0.95	0.43/0.62	10/36	A/E
14	US 20/Moore	Urban 4SG	0.85	0.69	19.3	B
15	Oceanview/25th	Urban 4ST	0.95/0.95	0.11/0.11	8/10	A/B
16	11th/Nye	Urban 4ST	0.95/0.95	0.03/0.19	7/10	A/B
17	Harney/7th	Urban 4ST - AWSC	0.95	0.20	9.5	A
18	Hurbert/9th	Urban 4ST	0.95/0.95	0.06/0.35	7/13	A/B
19	Abbey/9th	Urban 4ST	0.95/0.95	0.06/0.18	8/12	A/B
20	Bay/Moore	Urban 3ST	0.95/0.95	0.08/0.21	8/11	A/B

*Reported using HCM 2000 (v/c ratio only)

**Reported using HCM 2000

Intersection	
Int Delay, s/veh	25.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	5	95	0	15	5	885	60	20	690	2
Future Vol, veh/h	1	0	5	95	0	15	5	885	60	20	690	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	0	0	0	3	38	69	3	0
Mvmt Flow	1	0	5	100	0	16	5	932	63	21	726	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1751	1774	727	1714	1712	932	728	0	0	995	0	0
Stage 1	769	769	-	942	942	-	-	-	-	-	-	-
Stage 2	982	1005	-	772	770	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.17	6.5	6.2	4.1	-	-	4.79	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.563	4	3.3	2.2	-	-	2.821	-	-
Pot Cap-1 Maneuver	68	84	427	~ 69	91	326	885	-	-	489	-	-
Stage 1	397	413	-	309	344	-	-	-	-	-	-	-
Stage 2	302	322	-	385	413	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	62	80	427	~ 66	87	326	885	-	-	489	-	-
Mov Cap-2 Maneuver	62	80	-	~ 66	87	-	-	-	-	-	-	-
Stage 1	395	395	-	307	342	-	-	-	-	-	-	-
Stage 2	286	320	-	364	395	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.2	$ 405.2	0	0.4
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	885	-	-	216	74	489	-	-
HCM Lane V/C Ratio	0.006	-	-	0.029	1.565	0.043	-	-
HCM Control Delay (s)	9.1	-	-	22.2	$ 405.2	12.7	-	-
HCM Lane LOS	A	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	9.7	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	5	90	95	0	15	55	1080	120	30	850	30
Future Volume (veh/h)	35	5	90	95	0	15	55	1080	120	30	850	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1750	1750	1750	1695	1682	1750	1750	1695	1750
Adj Flow Rate, veh/h	37	5	95	100	0	16	58	1137	0	32	895	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	0	0	0	4	5	0	0	4	0
Cap, veh/h	55	4	297	59	0	299	79	1123		52	1102	
Arrive On Green	0.20	0.20	0.20	0.20	0.00	0.20	0.05	0.67	0.00	0.03	0.65	0.00
Sat Flow, veh/h	0	19	1457	0	0	1468	1615	1682	1483	1667	1695	1483
Grp Volume(v), veh/h	42	0	95	100	0	16	58	1137	0	32	895	0
Grp Sat Flow(s),veh/h/ln	19	0	1457	0	0	1468	1615	1682	1483	1667	1695	1483
Q Serve(g_s), s	0.0	0.0	6.8	0.0	0.0	1.1	4.4	82.0	0.0	2.3	48.1	0.0
Cycle Q Clear(g_c), s	24.5	0.0	6.8	24.5	0.0	1.1	4.4	82.0	0.0	2.3	48.1	0.0
Prop In Lane	0.88		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	0	297	59	0	299	79	1123		52	1102	
V/C Ratio(X)	0.71	0.00	0.32	1.71	0.00	0.05	0.74	1.01		0.62	0.81	
Avail Cap(c_a), veh/h	59	0	297	59	0	299	79	1123		81	1132	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.9	0.0	41.7	61.2	0.0	39.4	57.7	20.4	0.0	58.8	15.9	0.0
Incr Delay (d2), s/veh	31.4	0.0	0.5	379.7	0.0	0.1	28.8	30.0	0.0	8.5	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	2.5	8.0	0.0	0.4	2.4	35.7	0.0	1.1	17.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.3	0.0	42.1	440.9	0.0	39.4	86.5	50.4	0.0	67.3	21.0	0.0
LnGrp LOS	F	A	D	F	A	D	F	F		E	C	
Approach Vol, veh/h		137			116			1195	A		927	A
Approach Delay, s/veh		56.9			385.5			52.2			22.6	
Approach LOS		E			F			D			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	10.0	83.8	29.0	7.8	86.0	29.0
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	6.0	4.5
Max Green Setting (Gmax), s	5.5	80.0	24.5	5.5	80.0	24.5
Max Q Clear Time (g_c+I1), s	6.4	50.1	26.5	4.3	84.0	26.5
Green Ext Time (p_c), s	0.0	13.4	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	57.2
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	5	90	95	0	15	55	1080	120	30	850	30
Future Volume (vph)	35	5	90	95	0	15	55	1080	120	30	850	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.97	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1663	1440		1659	1442	1599	1667	1457	1662	1683	1488
Flt Permitted		0.68	1.00		0.73	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1176	1440		1274	1442	1599	1667	1457	1662	1683	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	5	95	100	0	16	58	1137	126	32	895	32
RTOR Reduction (vph)	0	0	83	0	0	14	0	0	19	0	0	9
Lane Group Flow (vph)	0	42	12	0	100	2	58	1137	107	32	895	23
Confl. Peds. (#/hr)	4		1	1		4						
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	4%	5%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4			6			2
Actuated Green, G (s)		13.7	13.7		13.7	13.7	4.4	83.3	83.3	3.2	82.1	82.1
Effective Green, g (s)		14.2	14.2		14.2	14.2	4.9	85.3	85.3	3.7	84.1	84.1
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.04	0.74	0.74	0.03	0.73	0.73
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.5	4.8	4.8	2.5	4.8	4.8
Lane Grp Cap (vph)		144	177		157	177	68	1234	1078	53	1228	1086
v/s Ratio Prot							c0.04	c0.68		0.02	0.53	
v/s Ratio Perm		0.04	0.01		c0.08	0.00			0.07			0.02
v/c Ratio		0.29	0.07		0.64	0.01	0.85	0.92	0.10	0.60	0.73	0.02
Uniform Delay, d1		45.9	44.6		48.0	44.3	54.8	12.2	4.2	55.0	9.0	4.3
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.1		7.2	0.0	60.3	11.7	0.1	15.3	2.6	0.0
Delay (s)		46.7	44.8		55.3	44.4	115.1	23.9	4.3	70.3	11.6	4.3
Level of Service		D	D		E	D	F	C	A	E	B	A
Approach Delay (s)		45.4			53.7			26.1			13.3	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Int Delay, s/veh	12.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	60	20	1150	970	55
Future Vol, veh/h	130	60	20	1150	970	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	300	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	11	5	4	4
Mvmt Flow	138	64	21	1223	1032	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2297	1032	1091	0	-	0
Stage 1	1032	-	-	-	-	-
Stage 2	1265	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.299	-	-	-
Pot Cap-1 Maneuver	~ 43	285	607	-	-	-
Stage 1	347	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 41	285	607	-	-	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	268	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	156.9	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	607	-	180	-	-
HCM Lane V/C Ratio	0.035	-	1.123	-	-
HCM Control Delay (s)	11.1	-	156.9	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	10.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	15	1085	40	10	995
Future Vol, veh/h	25	15	1085	40	10	995
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	125	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	31	4	0	0	3
Mvmt Flow	27	16	1154	43	11	1059

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2235	1154	0	0	1197	0
Stage 1	1154	-	-	-	-	-
Stage 2	1081	-	-	-	-	-
Critical Hdwy	6.4	6.51	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.579	-	-	2.2	-
Pot Cap-1 Maneuver	47	210	-	-	590	-
Stage 1	303	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	46	210	-	-	590	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	322	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.5	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	178	590	-
HCM Lane V/C Ratio	-	-	0.239	0.018	-
HCM Control Delay (s)	-	-	31.5	11.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	10	1115	90	20	995
Future Vol, veh/h	35	10	1115	90	20	995
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	50	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	14	5	0	0	3
Mvmt Flow	38	11	1212	98	22	1082

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2338	1212	0	0	1310	0
Stage 1	1212	-	-	-	-	-
Stage 2	1126	-	-	-	-	-
Critical Hdwy	6.4	6.34	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.426	-	-	2.2	-
Pot Cap-1 Maneuver	41	209	-	-	535	-
Stage 1	284	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	39	209	-	-	535	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	284	-	-	-	-	-
Stage 2	300	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.8	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	161	535	-
HCM Lane V/C Ratio	-	-	0.304	0.041	-
HCM Control Delay (s)	-	-	36.8	12	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	55	80	325	30	90	60	1325	115	80	1075	20
Future Volume (vph)	40	55	80	325	30	90	60	1325	115	80	1075	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694	1405	1564	1495		1630	3162		1614	3218	
Flt Permitted		0.98	1.00	0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1694	1405	1564	1495		1630	3162		1614	3218	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	43	59	86	349	32	97	65	1425	124	86	1156	22
RTOR Reduction (vph)	0	0	78	0	22	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	102	8	244	212	0	65	1544	0	86	1177	0
Confl. Peds. (#/hr)	4		4	4		4	7		2	2		7
Heavy Vehicles (%)	0%	2%	4%	1%	0%	2%	2%	4%	0%	3%	3%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		10.5	10.5	22.1	22.1		6.7	60.3		8.6	62.2	
Effective Green, g (s)		11.0	11.0	22.6	22.6		7.2	61.3		9.1	63.2	
Actuated g/C Ratio		0.09	0.09	0.19	0.19		0.06	0.51		0.08	0.53	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)		2.5	2.5	2.5	2.5		2.5	5.1		2.5	5.1	
Lane Grp Cap (vph)		155	128	294	281		97	1615		122	1694	
v/s Ratio Prot		c0.06		c0.16	0.14		0.04	c0.49		c0.05	0.37	
v/s Ratio Perm			0.01									
v/c Ratio		0.66	0.06	0.83	0.75		0.67	0.96		0.70	0.69	
Uniform Delay, d1		52.7	49.8	46.9	46.1		55.2	28.1		54.1	21.2	
Progression Factor		1.00	1.00	1.00	1.00		1.07	0.58		1.00	1.00	
Incremental Delay, d2		8.7	0.1	17.0	10.4		12.0	11.7		15.8	2.4	
Delay (s)		61.4	49.9	63.9	56.5		70.9	27.9		69.9	23.6	
Level of Service		E	D	E	E		E	C		E	C	
Approach Delay (s)		56.1			60.3			29.6			26.7	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	15	25	30	10	50	10	1500	15	15	1445	25
Future Volume (veh/h)	75	15	25	30	10	50	10	1500	15	15	1445	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1709	1709
Adj Flow Rate, veh/h	79	16	26	32	11	53	11	1579	16	16	1521	26
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	3	0	3	3
Cap, veh/h	147	28	34	84	36	99	24	2525	26	30	2515	43
Arrive On Green	0.11	0.12	0.11	0.11	0.12	0.11	0.03	1.00	1.00	0.04	1.00	1.00
Sat Flow, veh/h	845	245	298	382	315	858	1667	3292	33	1667	3265	56
Grp Volume(v), veh/h	121	0	0	96	0	0	11	778	817	16	755	792
Grp Sat Flow(s),veh/h/ln	1388	0	0	1554	0	0	1667	1624	1702	1667	1624	1697
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.3	0.0	0.0	6.9	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0
Prop In Lane	0.65		0.21	0.33		0.55	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	204	0	0	213	0	0	24	1245	1305	30	1251	1308
V/C Ratio(X)	0.59	0.00	0.00	0.45	0.00	0.00	0.46	0.62	0.63	0.53	0.60	0.61
Avail Cap(c_a), veh/h	336	0	0	349	0	0	83	1245	1305	83	1251	1308
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.41	0.41	0.41	0.65	0.65	0.65
Uniform Delay (d), s/veh	51.7	0.0	0.0	50.2	0.0	0.0	57.8	0.0	0.0	57.4	0.0	0.0
Incr Delay (d2), s/veh	2.1	0.0	0.0	1.1	0.0	0.0	4.1	1.0	0.9	7.0	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	2.8	0.0	0.0	0.4	0.3	0.3	0.5	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.8	0.0	0.0	51.3	0.0	0.0	61.9	1.0	0.9	64.3	1.4	1.4
LnGrp LOS	D	A	A	D	A	A	E	A	A	E	A	A
Approach Vol, veh/h		121			96			1606			1563	
Approach Delay, s/veh		53.8			51.3			1.4			2.0	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	5.7	96.4	17.8	6.2	96.0	17.8
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	5.0	4.5
Max Green Setting (Gmax), s	5.5	76.0	24.5	5.5	76.0	24.5
Max Q Clear Time (g_c+I1), s	2.8	2.0	8.9	3.1	2.0	12.3
Green Ext Time (p_c), s	0.0	51.9	0.3	0.0	54.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	35	30	75	20	35	35	1445	25	25	1400	30
Future Volume (veh/h)	90	35	30	75	20	35	35	1445	25	25	1400	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1695	1695
Adj Flow Rate, veh/h	100	39	33	83	22	39	39	1606	28	28	1556	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	3	0	4	4
Cap, veh/h	127	50	42	113	30	53	55	1907	33	41	1855	39
Arrive On Green	0.12	0.13	0.12	0.10	0.12	0.10	0.03	0.58	0.57	0.05	1.00	1.00
Sat Flow, veh/h	954	372	315	932	247	438	1667	3265	57	1667	3225	68
Grp Volume(v), veh/h	172	0	0	144	0	0	39	797	837	28	776	813
Grp Sat Flow(s),veh/h/ln	1641	0	0	1617	0	0	1667	1624	1698	1667	1611	1682
Q Serve(g_s), s	12.2	0.0	0.0	10.4	0.0	0.0	2.8	48.2	48.5	2.0	0.0	0.0
Cycle Q Clear(g_c), s	12.2	0.0	0.0	10.4	0.0	0.0	2.8	48.2	48.5	2.0	0.0	0.0
Prop In Lane	0.58		0.19	0.58		0.27	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	219	0	0	195	0	0	55	948	992	41	927	968
V/C Ratio(X)	0.79	0.00	0.00	0.74	0.00	0.00	0.71	0.84	0.84	0.69	0.84	0.84
Avail Cap(c_a), veh/h	219	0	0	216	0	0	83	948	992	83	927	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.30	0.30	0.30	0.75	0.75	0.75
Uniform Delay (d), s/veh	51.1	0.0	0.0	51.8	0.0	0.0	57.4	20.4	20.5	56.6	0.0	0.0
Incr Delay (d2), s/veh	16.5	0.0	0.0	10.5	0.0	0.0	3.7	2.9	2.8	10.9	6.9	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	0.0	4.9	0.0	0.0	1.2	17.6	18.6	0.9	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	0.0	0.0	62.3	0.0	0.0	61.1	23.3	23.3	67.6	6.9	6.7
LnGrp LOS	E	A	A	E	A	A	E	C	C	E	A	A
Approach Vol, veh/h		172			144			1673			1617	
Approach Delay, s/veh		67.7			62.3			24.2			7.8	
Approach LOS		E			E			C			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	73.5		18.5	6.9	74.6		20.0
Change Period (Y+Rc), s	4.5	6.5		6.0	4.5	6.5		6.0
Max Green Setting (Gmax), s	5.5	63.5		14.0	5.5	63.5		14.0
Max Q Clear Time (g_c+I1), s	4.8	2.0		12.4	4.0	50.5		14.2
Green Ext Time (p_c), s	0.0	32.1		0.1	0.0	12.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Future Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	218	207	37	271	176	298	80	957	0	356	1037	85
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	7	2	2	0	4	10	4	3	3
Cap, veh/h	250	238	43	276	330	270	106	991		350	1396	114
Arrive On Green	0.15	0.17	0.16	0.17	0.19	0.19	0.06	0.31	0.00	0.07	0.15	0.15
Sat Flow, veh/h	1654	1423	254	1576	1723	1410	1667	3221	1367	1615	3032	248
Grp Volume(v), veh/h	218	0	244	271	176	298	80	957	0	356	555	567
Grp Sat Flow(s),veh/h/ln	1654	0	1678	1576	1723	1410	1667	1611	1367	1615	1624	1657
Q Serve(g_s), s	15.5	0.0	17.0	20.6	11.0	23.0	5.7	35.1	0.0	26.0	39.2	39.3
Cycle Q Clear(g_c), s	15.5	0.0	17.0	20.6	11.0	23.0	5.7	35.1	0.0	26.0	39.2	39.3
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	250	0	281	276	330	270	106	991		350	748	763
V/C Ratio(X)	0.87	0.00	0.87	0.98	0.53	1.10	0.75	0.97		1.02	0.74	0.74
Avail Cap(c_a), veh/h	289	0	294	276	330	270	153	991		350	748	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	49.8	0.0	48.7	49.3	43.7	48.5	55.2	40.9	0.0	55.7	44.1	44.1
Incr Delay (d2), s/veh	21.2	0.0	22.1	49.2	1.7	85.6	9.5	21.4	0.0	36.0	2.9	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	8.9	11.8	4.9	14.5	2.7	16.8	0.0	14.8	17.8	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.1	0.0	70.8	98.5	45.4	134.1	64.7	62.4	0.0	91.7	47.0	47.0
LnGrp LOS	E	A	E	F	D	F	E	E		F	D	D
Approach Vol, veh/h		462			745			1037	A		1478	
Approach Delay, s/veh		70.9			100.2			62.5			57.8	
Approach LOS		E			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	59.3	22.1	27.0	30.0	40.9	25.0	24.1
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	50.0	20.5	20.5	25.5	35.0	20.5	20.5
Max Q Clear Time (g_c+I1), s	17.7	41.3	17.5	25.0	28.0	37.1	22.6	19.0
Green Ext Time (p_c), s	0.0	6.6	0.1	0.0	0.0	0.0	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	69.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	25.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	20	20	10	10	120	10	1080	15	60	1135	55
Future Vol, veh/h	15	20	20	10	10	120	10	1080	15	60	1135	55
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	16	22	22	11	11	132	11	1187	16	66	1247	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2052	2667	693	2012	2689	613	1329	0	0	1214	0	0
Stage 1	1431	1431	-	1228	1228	-	-	-	-	-	-	-
Stage 2	621	1236	-	784	1461	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.78	6.5	6.94	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.78	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.78	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.64	4	3.32	2.2	-	-	2.24	-	-
Pot Cap-1 Maneuver	33	23	390	30	22	435	526	-	-	559	-	-
Stage 1	144	202	-	171	253	-	-	-	-	-	-	-
Stage 2	446	250	-	327	195	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	0	~ 12	376	-	11	430	515	-	-	553	-	-
Mov Cap-2 Maneuver	0	~ 12	-	-	11	-	-	-	-	-	-	-
Stage 1	132	109	-	158	234	-	-	-	-	-	-	-
Stage 2	276	232	-	134	105	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1092.8		0.5	2.9
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	515	-	-	23	-	553	-	-
HCM Lane V/C Ratio	0.021	-	-	2.628	-	0.119	-	-
HCM Control Delay (s)	12.1	0.4		$ 1092.8	-	12.4	2.5	-
HCM Lane LOS	B	A	-	F	-	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	7.6	-	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	25	35	70	40	45	20	965	10	45	1080	20
Future Volume (veh/h)	40	25	35	70	40	45	20	965	10	45	1080	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.98		0.98	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1682	1682	1682	1695	1695	1695	1723	1723	1723
Adj Flow Rate, veh/h	41	26	36	72	41	46	21	995	10	46	1113	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	5	5	5	4	4	4	2	2	2
Cap, veh/h	105	67	70	124	62	58	23	1135	12	52	1330	26
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.34	0.35	0.34	0.40	0.41	0.40
Sat Flow, veh/h	441	471	490	564	439	408	66	3279	35	127	3232	64
Grp Volume(v), veh/h	103	0	0	159	0	0	538	0	488	619	0	561
Grp Sat Flow(s),veh/h/ln	1403	0	0	1411	0	0	1692	0	1687	1716	0	1707
Q Serve(g_s), s	0.0	0.0	0.0	5.1	0.0	0.0	36.6	0.0	31.9	39.9	0.0	34.5
Cycle Q Clear(g_c), s	8.0	0.0	0.0	13.1	0.0	0.0	36.6	0.0	31.9	39.9	0.0	34.5
Prop In Lane	0.40		0.35	0.45		0.29	0.04		0.02	0.07		0.04
Lane Grp Cap(c), veh/h	235	0	0	238	0	0	586	0	584	706	0	702
V/C Ratio(X)	0.44	0.00	0.00	0.67	0.00	0.00	0.92	0.00	0.84	0.88	0.00	0.80
Avail Cap(c_a), veh/h	271	0	0	273	0	0	592	0	591	706	0	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	0.0	49.9	0.0	0.0	37.6	0.0	36.1	32.5	0.0	31.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	4.4	0.0	0.0	20.4	0.0	11.5	14.4	0.0	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.0	5.0	0.0	0.0	18.4	0.0	15.0	19.3	0.0	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	0.0	0.0	54.3	0.0	0.0	58.0	0.0	47.6	46.9	0.0	40.2
LnGrp LOS	D	A	A	D	A	A	E	A	D	D	A	D
Approach Vol, veh/h		103			159			1026			1180	
Approach Delay, s/veh		48.5			54.3			53.0			43.7	
Approach LOS		D			D			D			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		53.4		21.1		45.6		21.1				
Change Period (Y+Rc), s		5.0		4.5		5.0		4.5				
Max Green Setting (Gmax), s		45.0		19.5		41.0		19.5				
Max Q Clear Time (g_c+I1), s		41.9		15.1		38.6		10.0				
Green Ext Time (p_c), s		2.6		0.3		2.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			48.5
HCM 6th LOS			D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	60	10	0	30	25	1110	10	10	1195	20
Future Vol, veh/h	15	0	60	10	0	30	25	1110	10	10	1195	20
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	17	0	67	11	0	33	28	1233	11	11	1328	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2057	2682	688	1989	2688	640	1363	0	0	1252	0	0
Stage 1	1374	1374	-	1303	1303	-	-	-	-	-	-	-
Stage 2	683	1308	-	686	1385	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	33	22	393	37	22	423	490	-	-	563	-	-
Stage 1	156	215	-	173	233	-	-	-	-	-	-	-
Stage 2	410	231	-	408	213	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	27	19	388	27	19	416	484	-	-	559	-	-
Mov Cap-2 Maneuver	27	19	-	27	19	-	-	-	-	-	-	-
Stage 1	145	196	-	162	218	-	-	-	-	-	-	-
Stage 2	352	216	-	311	194	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	110.6	79	0.3	0.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	484	-	-	106	90	559	-	-
HCM Lane V/C Ratio	0.057	-	-	0.786	0.494	0.02	-	-
HCM Control Delay (s)	12.9	-	-	110.6	79	11.6	0.4	-
HCM Lane LOS	B	-	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	4.3	2.1	0.1	-	-

Intersection	
Int Delay, s/veh	17.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Future Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	16	732	47	126	658	5	21	5	221	5	11	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	780	0	0	1729	1705	758	1816	1726	663
Stage 1	-	-	-	-	-	-	789	789	-	914	914	-
Stage 2	-	-	-	-	-	-	940	916	-	902	812	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	935	-	-	828	-	-	68	92	405	61	90	459
Stage 1	-	-	-	-	-	-	378	405	-	330	355	-
Stage 2	-	-	-	-	-	-	311	354	-	335	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	827	-	-	48	77	404	23	75	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	77	-	23	75	-
Stage 1	-	-	-	-	-	-	371	398	-	324	301	-
Stage 2	-	-	-	-	-	-	231	300	-	147	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	118.2	55.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	235	934	-	-	827	-	-	126
HCM Lane V/C Ratio	1.053	0.017	-	-	0.153	-	-	0.459
HCM Control Delay (s)	118.2	8.9	-	-	10.1	-	-	55.8
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	10.4	0.1	-	-	0.5	-	-	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Future Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1750	1750	1750
Adj Flow Rate, veh/h	65	908	147	82	620	212	136	87	82	190	71	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	0	0	0
Cap, veh/h	87	1228	199	106	758	622	340	202	529	265	95	49
Arrive On Green	0.06	0.44	0.42	0.06	0.44	0.44	0.36	0.37	0.37	0.36	0.37	0.36
Sat Flow, veh/h	1537	2821	457	1628	1709	1402	749	545	1431	546	256	132
Grp Volume(v), veh/h	65	527	528	82	620	212	223	0	82	304	0	0
Grp Sat Flow(s),veh/h/ln	1537	1637	1641	1628	1709	1402	1294	0	1431	934	0	0
Q Serve(g_s), s	3.9	24.8	24.8	4.6	29.3	9.2	0.0	0.0	3.5	18.5	0.0	0.0
Cycle Q Clear(g_c), s	3.9	24.8	24.8	4.6	29.3	9.2	12.0	0.0	3.5	30.5	0.0	0.0
Prop In Lane	1.00		0.28	1.00		1.00	0.61		1.00	0.62		0.14
Lane Grp Cap(c), veh/h	87	712	714	106	758	622	535	0	529	404	0	0
V/C Ratio(X)	0.74	0.74	0.74	0.78	0.82	0.34	0.42	0.00	0.15	0.75	0.00	0.00
Avail Cap(c_a), veh/h	100	797	799	106	832	683	639	0	635	504	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.9	21.7	21.9	42.6	22.5	16.9	22.1	0.0	19.5	32.4	0.0	0.0
Incr Delay (d2), s/veh	21.1	6.0	6.0	28.7	8.8	1.2	0.4	0.0	0.1	4.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	10.2	10.3	2.7	12.9	3.1	3.7	0.0	1.2	7.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.1	27.8	27.9	71.3	31.3	18.1	22.5	0.0	19.6	37.3	0.0	0.0
LnGrp LOS	E	C	C	E	C	B	C	A	B	D	A	A
Approach Vol, veh/h		1120			914			305			304	
Approach Delay, s/veh		30.0			31.8			21.7			37.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	44.2		38.2	9.2	45.0		38.2				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	5.5	44.0		40.5	5.5	44.0		40.5				
Max Q Clear Time (g_c+I1), s	6.6	26.8		32.5	5.9	31.3		14.0				
Green Ext Time (p_c), s	0.0	12.4		1.2	0.0	8.0		1.4				

Intersection Summary			
HCM 6th Ctrl Delay			30.5
HCM 6th LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	80	0	70	0	110	100	20	90	0
Future Vol, veh/h	0	0	0	80	0	70	0	110	100	20	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	7	0	0	0	0	0	0	2	0
Mvmt Flow	0	0	0	99	0	86	0	136	123	25	111	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	402	421	111	360	360	199	111	0	0	260	0	0
Stage 1	161	161	-	199	199	-	-	-	-	-	-	-
Stage 2	241	260	-	161	161	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.17	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.563	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	562	527	948	586	570	847	1492	-	-	1316	-	-
Stage 1	846	769	-	791	740	-	-	-	-	-	-	-
Stage 2	767	697	-	829	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	497	516	948	577	558	846	1492	-	-	1315	-	-
Mov Cap-2 Maneuver	497	516	-	577	558	-	-	-	-	-	-	-
Stage 1	846	754	-	790	739	-	-	-	-	-	-	-
Stage 2	689	696	-	812	754	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.3	0	1.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1492	-	-	-	678	1315	-	-
HCM Lane V/C Ratio	-	-	-	-	0.273	0.019	-	-
HCM Control Delay (s)	0	-	-	0	12.3	7.8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	1.1	0.1	-	-

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	30	5	15	25	10	15	100	55	15	60	5
Future Vol, veh/h	5	30	5	15	25	10	15	100	55	15	60	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	38	6	19	31	13	19	125	69	19	75	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	44	0	0	44	0	0	170	135	43	228	132	39
Stage 1	-	-	-	-	-	-	53	53	-	76	76	-
Stage 2	-	-	-	-	-	-	117	82	-	152	56	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1577	-	-	1577	-	-	798	760	1033	731	762	1038
Stage 1	-	-	-	-	-	-	965	855	-	938	836	-
Stage 2	-	-	-	-	-	-	892	831	-	855	852	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1577	-	-	1577	-	-	723	748	1031	586	750	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	723	748	-	586	750	-
Stage 1	-	-	-	-	-	-	961	852	-	934	826	-
Stage 2	-	-	-	-	-	-	796	821	-	677	849	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	2.2	10.9	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	818	1577	-	-	1577	-	-	725
HCM Lane V/C Ratio	0.26	0.004	-	-	0.012	-	-	0.138
HCM Control Delay (s)	10.9	7.3	0	-	7.3	0	-	10.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.5

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	40	135	25	30	0	125	0	35	0	1	0
Future Vol, veh/h	1	40	135	25	30	0	125	0	35	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	1	0	0	0	0	0
Mvmt Flow	1	45	152	28	34	0	140	0	39	0	1	0
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	8.1	8.1	9.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	1%	45%	0%
Vol Thru, %	0%	0%	23%	55%	100%
Vol Right, %	0%	100%	77%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	35	176	55	1
LT Vol	125	0	1	25	0
Through Vol	0	0	40	30	1
RT Vol	0	35	135	0	0
Lane Flow Rate	140	39	198	62	1
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.217	0.048	0.219	0.08	0.001
Departure Headway (Hd)	5.569	4.374	3.995	4.672	4.79
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	645	823	902	768	746
Service Time	3.297	2.074	2.009	2.694	2.826
HCM Lane V/C Ratio	0.217	0.047	0.22	0.081	0.001
HCM Control Delay	9.8	7.3	8.1	8.1	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.8	0.3	0

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	55	10	5	70	20	20	215	15	20	100	70
Future Vol, veh/h	10	55	10	5	70	20	20	215	15	20	100	70
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	11	63	11	6	80	23	23	244	17	23	114	80

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	107	0	0	89	0	0	309	225	95	340	219	98
Stage 1	-	-	-	-	-	-	106	106	-	108	108	-
Stage 2	-	-	-	-	-	-	203	119	-	232	111	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.16	6.52	6.43	7.1	6.56	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.1	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.1	5.56	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.554	4.018	3.507	3.5	4.054	3.3
Pot Cap-1 Maneuver	1497	-	-	1519	-	-	636	674	907	618	672	963
Stage 1	-	-	-	-	-	-	890	807	-	902	798	-
Stage 2	-	-	-	-	-	-	790	797	-	775	796	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1491	-	-	1497	-	-	492	654	885	420	652	958
Mov Cap-2 Maneuver	-	-	-	-	-	-	492	654	-	420	652	-
Stage 1	-	-	-	-	-	-	870	789	-	891	792	-
Stage 2	-	-	-	-	-	-	617	791	-	515	778	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.4	14.8	12.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	647	1491	-	-	1497	-	-	693
HCM Lane V/C Ratio	0.439	0.008	-	-	0.004	-	-	0.312
HCM Control Delay (s)	14.8	7.4	0	-	7.4	0	-	12.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.2	0	-	-	0	-	-	1.3

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	35	15	1	75	45	20	80	10	40	45	15
Future Vol, veh/h	25	35	15	1	75	45	20	80	10	40	45	15
Conflicting Peds, #/hr	23	0	27	27	0	23	8	0	34	34	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	3	0	4	0	6	0	7
Mvmt Flow	30	42	18	1	90	54	24	96	12	48	54	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	167	0	0	87	0	0	301	307	112	341	289	148
Stage 1	-	-	-	-	-	-	138	138	-	142	142	-
Stage 2	-	-	-	-	-	-	163	169	-	199	147	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.54	6.2	7.16	6.5	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.54	-	6.16	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.54	-	6.16	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.036	3.3	3.554	4	3.363
Pot Cap-1 Maneuver	1423	-	-	1522	-	-	655	604	947	605	624	886
Stage 1	-	-	-	-	-	-	870	779	-	851	783	-
Stage 2	-	-	-	-	-	-	844	755	-	794	779	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1392	-	-	1483	-	-	566	562	893	482	581	860
Mov Cap-2 Maneuver	-	-	-	-	-	-	566	562	-	482	581	-
Stage 1	-	-	-	-	-	-	829	742	-	814	765	-
Stage 2	-	-	-	-	-	-	761	738	-	645	742	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0.1	13	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	582	1392	-	-	1483	-	-	562
HCM Lane V/C Ratio	0.228	0.022	-	-	0.001	-	-	0.214
HCM Control Delay (s)	13	7.6	0	-	7.4	0	-	13.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0	-	-	0.8

Intersection						
Int Delay, s/veh	4.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	100	145	160	155	110
Future Vol, veh/h	65	100	145	160	155	110
Conflicting Peds, #/hr	2	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	100	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	0	0	3	3	8
Mvmt Flow	72	111	161	178	172	122

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	674	181	172	0	-	0
Stage 1	172	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	417	867	1417	-	-	-
Stage 1	853	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	369	860	1417	-	-	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	604	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	3.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1417	-	564	-	-
HCM Lane V/C Ratio	0.114	-	0.325	-	-
HCM Control Delay (s)	7.9	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.4	-	-

	use dropdown	use dropdown	use dropdown	use dropdown			BEGIN	1	3	4	5	6	7	8	9	10	11	12	13	14		Critical Flow Calculator									
Intersection ID and Name	**NB PhasingType**	**SB PhasingType**	**EB PhasingType**	**WB PhasingType**	**Cycle Length**	**Lost Time**	CALCULATIONS		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**WBL/EBT**	**EBL/WBT**	**NBL/SBT**	**SBL/NBT**	**V/S E/W**	**V/S N/S**	**Intersection V/C**	**HCM 6th Ctrl Delay**	**HCM 6th LOS**	**Synchro ID**
2: US 101 & Lighthouse Dr/52nd St	Protected	Protected	Permitted	Permitted	125	12		Adj Flow Rate, veh/h	37	5	95	100	0	16	58	1137	0	32	895	0	Protected	0.26	0.01	0.56	0.70						
								Sat Flow, veh/h	0	19	1457	0	0	1468	1615	1682	1483	1667	1695	1483	Permitted or Split	0.26	0.01	0.53	0.68						
								V/S	0.00	0.26	0.07	0.00	0.00	0.01	0.04	0.68	0.00	0.02	0.53	0.00	selected phasing	0.26	0.01	0.56	0.70	0.26	0.70	**1.06**	**57.2**	**E**	2
7: US 101 & 11th St	Protected	Protected	Permitted	Permitted	120	12		Adj Flow Rate, veh/h	79	16	26	32	11	53	11	1579	16	16	1521	26	Protected	0.17	0.16	0.47	0.49						
								Sat Flow, veh/h	845	245	298	382	315	858	1667	3292	33	1667	3265	56	Permitted or Split	0.09	0.08	0.47	0.48						
								V/S	0.09	0.07	0.09	0.08	0.03	0.06	0.01	0.48	0.48	0.01	0.47	0.46	selected phasing	0.09	0.08	0.47	0.49	0.09	0.49	**0.65**	**5**	**A**	7
8: US 101 & 6th St	Protected	Protected	Split	Split	120	16		Adj Flow Rate, veh/h	100	39	33	83	22	39	39	1606	28	28	1556	33	Protected	0.19	0.19	0.51	0.51						
								Sat Flow, veh/h	954	372	315	932	247	438	1667	3265	57	1667	3225	68	Permitted or Split	0.10	0.09	0.49	0.49						
								V/S	0.10	0.10	0.10	0.09	0.09	0.09	0.02	0.49	0.49	0.02	0.48	0.49	selected phasing	0.10	0.09	0.51	0.51	0.19	0.51	**0.81**	**20.4**	**C**	8
9: US 101 & Olive St/US 20	Protected	Protected	Protected	Protected	120	16		Adj Flow Rate, veh/h	218	207	37	271	176	298	80	957	0	356	1037	85	Protected	0.32	0.34	0.39	0.52						
								Sat Flow, veh/h	1654	1423	254	1576	1723	1410	1667	3221	1367	1615	3032	248	Permitted or Split	0.15	0.21	0.34	0.30						
								V/S	0.13	0.15	0.15	0.17	0.10	0.21	0.05	0.30	0.00	0.22	0.34	0.34	selected phasing	0.32	0.34	0.39	0.52	0.34	0.52	**0.99**	**69.2**	**E**	9
11: US 101 & Hurbert St	Split	Split	Permitted	Permitted	120	12		Adj Flow Rate, veh/h	41	26	36	72	41	46	21	995	10	46	1113	21	Protected	0.20	0.21	0.66	0.67						
								Sat Flow, veh/h	441	471	490	564	439	408	66	3279	35	127	3232	64	Permitted or Split	0.09	0.13	0.36	0.32						
								V/S	0.09	0.06	0.07	0.13	0.09	0.11	0.32	0.30	0.29	0.36	0.34	0.33	selected phasing	0.09	0.13	0.36	0.32	0.13	0.68	**0.90**	**48.5**	**D**	11
14: Moore Dr/Harney St & US 20	Permitted	Permitted	Protected	Protected	104	12		Adj Flow Rate, veh/h	65	908	147	82	620	212	136	87	82	190	71	43	Protected	0.37	0.41	0.51	0.51						
								Sat Flow, veh/h	1537	2821	457	1628	1709	1402	749	545	1431	546	256	132	Permitted or Split	0.32	0.36	0.35	0.18						
								V/S	0.04	0.32	0.32	0.05	0.36	0.15	0.18	0.16	0.06	0.35	0.28	0.33	selected phasing	0.37	0.41	0.35	0.18	0.41	0.35	**0.85**	**30.5**	**C**	14
								Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	
								Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	
								Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	

Sheet Description:
This sheet reads in the adjusted flow rate and the saturation flow rate from Synchro and divides them to calculated the V/S for each movement.
The critical flow calculator calculates the critical v/s for each conflicting phase pair.
for protected phases, this v/s is the left turn v/s plus the max of the opposing movement v/s
for the permitted and split phases, this v/s is the max of the three movement v/s
The next step selects the proper v/s based on phasing provided
V/S by east-west and north-south is selected by taking the max of the phase pairs or by adding them (if split phasing)
If overlap calculator was selected in input section and overlap phases were indicated, then overlap v/s for intersection is calculated. See details below
If the right turn v/s is greater than the through v/s for the right turn overlap approach, then the right turn is assumed the critical movement and intersection v/c calc will use the v/s overlap instead of approach v/s
The final step in v/c calculation uses the approach v/s ratios, cycle length, and lost time to calculate overall intersection v/c
Delay and LOS are read directly from the HCM 6 report

Overlap Calculator Details
Overlap calculator reads in whether an overlap phase is in use and what type of phasing is associated with the right turn approach and the overlapped approach
V/S is read in for right turn movement, and remaining approaches from previous calculations
-right turn overlap v/s is just the v/s for the right turn movement (i.e. NBR)
-right turn approach v/s is the critical v/s associated with the right turn approaches (i.e. NB/SB) and is calculated differently for protected vs split
-overlap approach v/s is the critical v/s associated with the overlap approaches (i.e. EB/WB) and is calculated differently for protected vs split phasing
The v/s overlap column sums the 3 v/s values for the overlap phasing to get the total v/s overlap to be used in the v/c calculation
If there are overlaps for multiple approaches, the v/s overlap will use the greatest of the approaches for most conservative approach
Use Overlap Calculator' must be enabled and 'Use OV V/S' must be showing in V/S Overlap column in order for overlap v/s to be used in final v/c calculation

	use dropdown	BEGIN	Sat. Flow Default	1700	1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
Intersection ID and Name	**Control Type**	CALCULATIONS	**Major Approach**	**Row Reference**		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**NB**	**SB**	**EB**	**WB**	**Synchro ID**
1: US 101 & 73rd Ct/73rd St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	1: US 101 & 73rd Ct/73rd St V/C	**0.55**	**0.43**	**0.03**	**1.57**	**1**
				8	Lane Configurations	0	1	0	0	1	0	1	1	1	1	1	0	1: US 101 & 73rd Ct/73rd St Delay	**9.10**	**12.70**	**22.20**	**405.20**	
				19	Mvmt Flow	1	0	5	100	0	16	5	932	63	21	726	2	1: US 101 & 73rd Ct/73rd St LOS	**A**	**B**	**C**	**F**	
				10	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	L	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C		0.00	0.00		0.01	0.01	0.01	0.55	0.04	0.04	0.43	0.43						
					Minor (or AWSC) V/C	0.03			1.57														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.01	-	-	0.03	1.57	0.04	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	9.1	-	-	22.2	405.2	12.7	-	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	-	-	C	F	B	-	-	0	0	0						
3: US 101 & Oceanview Dr	TWSC		NB/SB	7	Movement	EBL		EBR				NBL	NBT			SBT	SBR	3: US 101 & Oceanview Dr V/C	**0.72**	**0.61**	**1.12**	**0.00**	**3**
				8	Lane Configurations	1		0				1	1			1	1	3: US 101 & Oceanview Dr Delay	**11.10**	**0.00**	**156.90**	**0.00**	
				19	Mvmt Flow	138	0	64	0	0	0	21	1223	0	0	1032	59	3: US 101 & Oceanview Dr LOS	**B**	**A**	**F**	**A**	
				70	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C							0.04	0.72			0.61	0.03						
					Minor (or AWSC) V/C	1.12																	
				45	Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.04	-	1.12	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	11.1	-	156.9	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	F	-	-	0	0	0	0	0	0						
4: US 101 & 36th Street	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		4: US 101 & 36th Street V/C	**0.68**	**0.62**	**0.00**	**0.24**	**4**
				8	Lane Configurations				1		0		1	1	1	1		4: US 101 & 36th Street Delay	**0.00**	**11.20**	**0.00**	**31.50**	
				19	Mvmt Flow	0	0	0	27	0	16	0	1154	43	11	1059	0	4: US 101 & 36th Street LOS	**A**	**B**	**A**	**D**	
				130	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.68	0.03	0.02	0.62							
					Minor (or AWSC) V/C				0.24														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.24	0.02	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	31.5	11.2	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	D	B	-	0	0	0	0	0	0						
5: US 101 & 31st St	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		5: US 101 & 31st St V/C	**0.71**	**0.64**	**0.00**	**0.30**	**5**
				8	Lane Configurations				1		0		1	1	1	1		5: US 101 & 31st St Delay	**0.00**	**12.00**	**0.00**	**36.80**	
				19	Mvmt Flow	0	0	0	38	0	11	0	1212	98	22	1082	0	5: US 101 & 31st St LOS	**A**	**B**	**A**	**E**	
				187	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.71	0.06	0.04	0.64							
					Minor (or AWSC) V/C				0.30														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.30	0.04	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	36.8	12.0	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	E	B	-	0	0	0	0	0	0						
10: US 101 & Angle St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	10: US 101 & Angle St V/C	**0.37**	**0.49**	**2.63**	**0.00**	**10**
				8	Lane Configurations	0	1	0	0	1	0	0	2	0	0	2	0	10: US 101 & Angle St Delay	**12.10**	**12.40**	**1092.80**	**0.00**	
				19	Mvmt Flow	16	22	22	11	11	132	11	1187	16	66	1247	60	10: US 101 & Angle St LOS	**B**	**B**	**F**	**A**	
				244	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.03	0.03		0.08	0.08	0.37	0.35	0.35	0.49	0.38	0.38						
					Minor (or AWSC) V/C	2.63			-														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.02	-	-	2.63	-	0.12	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	12.1	0.4	-	1092.8	-	12.4	2.5	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	A	-	F	-	B	A	-	0	0	0						
12: US 101 & Bayley St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	12: US 101 & Bayley St V/C	**0.37**	**0.41**	**0.79**	**0.49**	**12**
				8	Lane Configurations	0	1	0	0	1	0	1	2	0	0	2	0	12: US 101 & Bayley St Delay	**12.90**	**11.60**	**110.60**	**79.00**	
				19	Mvmt Flow	17	0	67	11	0	33	28	1233	11	11	1328	22	12: US 101 & Bayley St LOS	**B**	**B**	**F**	**F**	
				304	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.04	0.04		0.02	0.02	0.06	0.37	0.37	0.41	0.40	0.40						
					Minor (or AWSC) V/C	0.79			0.49														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.06	-	-	0.79	0.49	0.02	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	12.9	-	-	110.6	79.0	11.6	0.4	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	-	F	F	B	A	-	0	0	0						
13: Benton St & US 20	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	13: Benton St & US 20 V/C	**1.05**	**0.46**	**0.46**	**0.39**	**13**
				8	Lane Configurations	1	1	0	1	1	0	0	1	0	0	1	0	13: Benton St & US 20 Delay	**118.20**	**55.80**	**8.90**	**10.10**	
				19	Mvmt Flow	16	732	47	126	658	5	21	5	221	5	11	42	13: Benton St & US 20 LOS	**F**	**F**	**A**	**B**	
				361	Major V/C Lanes	L	T or TR	TR or R	L	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.02	0.46	0.46	0.15	0.39	0.39		0.13	0.13		0.03	0.03						
					Minor (or AWSC) V/C							1.05			0.46								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	1.05	0.02	-	-	0.15	-	-	0.46	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	118.2	8.9	-	-	10.1	-	-	55.8	0.0	0.0	0.0						
				49	HCM Lane LOS	0	F	A	-	-	B	-	-	F	0	0	0						
15: Oceanview Dr & Pacific Pl/25th St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	15: Oceanview Dr & Pacific Pl/25th St V/C	**0.15**	**0.08**	**0.00**	**0.27**	**15**
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	15: Oceanview Dr & Pacific Pl/25th St Delay	**0.00**	**7.80**	**0.00**	**12.30**	

Intersection ID and Name	use dropdown Control Type	BEGIN CALCULATIONS	Sat. Flow Default Major Approach	1700 Row Reference	1 EBL	3 EBT	4 EBR	5 WBL	6 WBT	7 WBR	8 NBL	9 NBT	10 NBR	11 SBL	12 SBT	13 SBR	14 Outputs	NB	SB	EB	WB	Synchro ID
				19 Mvmt Flow	0	0	0	99	0	86	0	136	123	25	111	0	15: Oceanview Dr & Pacific Pl/25th St LOS	A	A	A	B	
				418 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C		0.00	0.00		0.05	0.05		0.15	0.15	0.08	0.07	0.07						
				Minor (or AWSC) V/C	-			0.27														
				45 Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47 HCM Lane V/C Ratio	0.00	-	-	-	-	0.27	0.02	-	-	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	0.0	-	-	0.0	12.3	7.8	0.0	-	0.0	0.0	0.0						
				49 HCM Lane LOS	0	A	-	-	A	B	A	A	-	0	0	0						
16: Nye St & 11th St	TWSC		EB/WB	7 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	16: Nye St & 11th St V/C	0.26	0.14	0.03	0.04	16
				8 Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	16: Nye St & 11th St Delay	10.90	10.80	7.30	7.30	
				19 Mvmt Flow	6	38	6	19	31	13	19	125	69	19	75	6	16: Nye St & 11th St LOS	B	B	A	A	
				475 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C	0.03	0.03	0.03	0.04	0.03	0.03		0.11	0.11		0.05	0.05						
				Minor (or AWSC) V/C							0.26			0.14								
				45 Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.26	0.00	-	-	0.01	-	-	0.14	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	10.9	7.3	0.0	-	7.3	0.0	-	10.8	0.0	0.0	0.0						
				49 HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
17: Harney St & 7th St	AWSC		N/A	9 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	17: Harney St & 7th St V/C	0.22	0.00	0.22	0.08	17
				10 Lane Configurations	0	1	0	0	1	0	0	1	1	0	1	0	17: Harney St & 7th St Delay	9.80	7.80	8.10	8.10	
				15 Mvmt Flow	1	45	152	28	34	0	140	0	39	0	1	0	17: Harney St & 7th St LOS	A	A	A	A	
				534 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LT	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C		0.12	0.12		0.02	0.02		0.00	0.02		0.00	0.00						
				Minor (or AWSC) V/C	0.22			0.08			0.22	0.05		0.00								
				29 Lane	0	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	0	0	0	0	0	0						
				45 HCM Lane V/C Ratio	0.00	0.22	0.05	0.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
				46 HCM Control Delay	0.0	9.8	7.3	8.1	8.1	7.8	0.0	0.0	0.0	0.0	0.0	0.0						
				47 HCM Lane LOS	0	A	A	A	A	A	0	0	0	0	0	0						
18: 9th St & Hurbert St	TWSC		EB/WB	7 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	18: 9th St & Hurbert St V/C	0.44	0.31	0.05	0.06	18
				8 Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	18: 9th St & Hurbert St Delay	14.80	12.50	7.40	7.40	
				19 Mvmt Flow	11	63	11	6	80	23	23	244	17	23	114	80	18: 9th St & Hurbert St LOS	B	B	A	A	
				587 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C	0.05	0.04	0.04	0.06	0.06	0.06		0.15	0.15		0.11	0.11						
				Minor (or AWSC) V/C							0.44			0.31								
				45 Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.44	0.01	-	-	0.00	-	-	0.31	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	14.8	7.4	0.0	-	7.4	0.0	-	12.5	0.0	0.0	0.0						
				49 HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
19: 9th St & Abbey St	TWSC		EB/WB	7 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	19: 9th St & Abbey St V/C	0.23	0.21	0.06	0.09	19
				8 Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	19: 9th St & Abbey St Delay	13.00	13.10	7.60	7.40	
				19 Mvmt Flow	30	42	18	1	90	54	24	96	12	48	54	18	19: 9th St & Abbey St LOS	B	B	A	A	
				644 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C	0.06	0.04	0.04	0.09	0.08	0.08		0.06	0.06		0.04	0.04						
				Minor (or AWSC) V/C							0.23			0.21								
				45 Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.23	0.02	-	-	0.00	-	-	0.21	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	13.0	7.6	0.0	-	7.4	0.0	-	13.1	0.0	0.0	0.0						
				49 HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
20: Bay Blvd & Moore Dr	TWSC		NB/SB	7 Movement	EBL		EBR				NBL	NBT			SBT	SBR	20: Bay Blvd & Moore Dr V/C	0.11	0.10	0.33	0.00	20
				8 Lane Configurations	1		0				1	1			1	1	20: Bay Blvd & Moore Dr Delay	7.90	0.00	14.40	0.00	
				19 Mvmt Flow	72	0	111	0	0	0	161	178	0	0	172	122	20: Bay Blvd & Moore Dr LOS	A	A	B	A	
				701 Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
				Major V/C							0.11	0.10			0.10	0.07						
				Minor (or AWSC) V/C	0.33																	
				45 Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.11	-	0.33	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	7.9	-	14.4	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49 HCM Lane LOS	0	A	-	B	-	-	0	0	0	0	0	0						

Sheet Description:

This sheet reads in lane configurations by representing exclusive through or shared lanes with the number of lanes in the through movement, and any exclusive number of turn lanes in the respective turn movement. So a single LTR lane would have 1 under through and 0s under left and right.

This sheet also reads in movement flow and select v/c, LOS, and delay results. The calculations are shown in the box.

Calculations are split out by major and minor approach v/c; Major approach is determined from free approaches in report

The major v/c lanes row indicates the left turn lane configuration for each approach. This is important to determine how to add in the delay from the left turns to the overall calculated v/c for the major approach

In the major v/c row, left turn v/c is read from the report, while remaining movement v/c ratios are calculated based on the methodology given in the ODOT APM and the provided default saturation flow rate of 1700 (can be changed by user)

In the minor v/c row, v/c ratios by lane are calculated based on the ODOT APM method using volume and assumed saturation flow rate

The v/c ratio by approach is the max of the v/c by lane as calculated in the major or minor v/c rows

LOS and Delay by approach are read in from the report

For AWSC, all approaches are treated as minor approaches and the calculations remain the same

The summary table selects the worst approach for both directions and concatenates the results with a / for the final summary table for TWSC. For AWSC, the overall worst approach is reported.

Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	5	90	0	15	2	735	50	20	570	2
Future Vol, veh/h	1	0	5	90	0	15	2	735	50	20	570	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	0	0	0	3	38	69	3	0
Mvmt Flow	1	0	5	95	0	16	2	774	53	21	600	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1456	1474	601	1424	1422	774	602	0	0	827	0	0
Stage 1	643	643	-	778	778	-	-	-	-	-	-	-
Stage 2	813	831	-	646	644	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.17	6.5	6.2	4.1	-	-	4.79	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.563	4	3.3	2.2	-	-	2.821	-	-
Pot Cap-1 Maneuver	109	128	504	111	137	402	985	-	-	577	-	-
Stage 1	465	472	-	382	410	-	-	-	-	-	-	-
Stage 2	375	387	-	452	471	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	102	123	504	107	132	402	985	-	-	577	-	-
Mov Cap-2 Maneuver	102	123	-	107	132	-	-	-	-	-	-	-
Stage 1	464	455	-	381	409	-	-	-	-	-	-	-
Stage 2	360	386	-	431	454	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	130.2	0	0.4
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	985	-	-	304	120	577	-	-
HCM Lane V/C Ratio	0.002	-	-	0.021	0.921	0.036	-	-
HCM Control Delay (s)	8.7	-	-	17.1	130.2	11.5	-	-
HCM Lane LOS	A	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	5.9	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	5	75	85	0	15	45	915	130	30	720	25
Future Volume (veh/h)	30	5	75	85	0	15	45	915	130	30	720	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1750	1750	1750	1695	1682	1750	1750	1695	1750
Adj Flow Rate, veh/h	32	5	79	89	0	16	47	963	0	32	758	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	0	0	0	4	5	0	0	4	0
Cap, veh/h	60	5	325	64	0	328	65	1072		54	1067	
Arrive On Green	0.22	0.22	0.22	0.22	0.00	0.22	0.04	0.64	0.00	0.03	0.63	0.00
Sat Flow, veh/h	0	22	1458	0	0	1470	1615	1682	1483	1667	1695	1483
Grp Volume(v), veh/h	37	0	79	89	0	16	47	963	0	32	758	0
Grp Sat Flow(s),veh/h/ln	22	0	1458	0	0	1470	1615	1682	1483	1667	1695	1483
Q Serve(g_s), s	0.0	0.0	5.0	0.0	0.0	1.0	3.2	54.5	0.0	2.1	33.6	0.0
Cycle Q Clear(g_c), s	24.5	0.0	5.0	24.5	0.0	1.0	3.2	54.5	0.0	2.1	33.6	0.0
Prop In Lane	0.86		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	65	0	325	64	0	328	65	1072		54	1067	
V/C Ratio(X)	0.57	0.00	0.24	1.39	0.00	0.05	0.72	0.90		0.59	0.71	
Avail Cap(c_a), veh/h	65	0	325	64	0	328	86	1230		89	1240	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.6	0.0	35.8	55.8	0.0	34.2	53.2	17.3	0.0	53.5	13.9	0.0
Incr Delay (d2), s/veh	9.9	0.0	0.3	244.8	0.0	0.0	15.0	9.3	0.0	7.3	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.8	6.2	0.0	0.4	1.5	20.2	0.0	1.0	11.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	0.0	36.0	300.6	0.0	34.2	68.2	26.5	0.0	60.8	16.1	0.0
LnGrp LOS	E	A	D	F	A	C	E	C		E	B	
Approach Vol, veh/h		116			105			1010	A		790	A
Approach Delay, s/veh		44.5			260.0			28.4			17.9	
Approach LOS		D			F			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	74.6		29.0	7.7	75.4		29.0
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5
Max Green Setting (Gmax), s	5.5	80.0		24.5	5.5	80.0		24.5
Max Q Clear Time (g_c+I1), s	5.2	35.6		26.5	4.1	56.5		26.5
Green Ext Time (p_c), s	0.0	11.9		0.0	0.0	13.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	5	75	85	0	15	45	915	130	30	720	25
Future Volume (vph)	30	5	75	85	0	15	45	915	130	30	720	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.97	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1667	1441		1660	1445	1599	1667	1457	1662	1683	1488
Flt Permitted		0.71	1.00		0.73	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1242	1441		1280	1445	1599	1667	1457	1662	1683	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	5	79	89	0	16	47	963	137	32	758	26
RTOR Reduction (vph)	0	0	70	0	0	14	0	0	27	0	0	8
Lane Group Flow (vph)	0	37	9	0	89	2	47	963	110	32	758	18
Confl. Peds. (#/hr)	4		1	1		4						
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	4%	5%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4			6			2
Actuated Green, G (s)		9.9	9.9		9.9	9.9	4.2	61.3	61.3	2.6	59.7	59.7
Effective Green, g (s)		10.4	10.4		10.4	10.4	4.7	63.3	63.3	3.1	61.7	61.7
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.05	0.71	0.71	0.03	0.69	0.69
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.5	4.8	4.8	2.5	4.8	4.8
Lane Grp Cap (vph)		145	168		149	169	84	1188	1038	58	1169	1033
v/s Ratio Prot							c0.03	c0.58		0.02	0.45	
v/s Ratio Perm		0.03	0.01		c0.07	0.00			0.08			0.01
v/c Ratio		0.26	0.06		0.60	0.01	0.56	0.81	0.11	0.55	0.65	0.02
Uniform Delay, d1		35.7	34.8		37.2	34.7	41.0	8.7	4.0	42.2	7.5	4.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1		5.3	0.0	6.3	4.8	0.1	8.8	1.6	0.0
Delay (s)		36.4	34.9		42.5	34.7	47.4	13.5	4.0	51.0	9.2	4.2
Level of Service		D	C		D	C	D	B	A	D	A	A
Approach Delay (s)		35.4			41.3			13.7			10.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	30	20	1015	835	45
Future Vol, veh/h	85	30	20	1015	835	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	300	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	11	5	4	4
Mvmt Flow	90	32	21	1080	888	48

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2010	888	936	0	-	0
Stage 1	888	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.299	-	-	-
Pot Cap-1 Maneuver	~ 66	345	696	-	-	-
Stage 1	405	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 64	345	696	-	-	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	393	-	-	-	-	-
Stage 2	314	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.5	0.2	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	696	-	213	-	-
HCM Lane V/C Ratio	0.031	-	0.574	-	-
HCM Control Delay (s)	10.3	-	42.5	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.1	-	3.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	15	1000	35	10	840
Future Vol, veh/h	20	15	1000	35	10	840
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	125	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	31	4	0	0	3
Mvmt Flow	21	16	1064	37	11	894

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1980	1064	0	0	1101	0
Stage 1	1064	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Critical Hdwy	6.4	6.51	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.579	-	-	2.2	-
Pot Cap-1 Maneuver	69	238	-	-	642	-
Stage 1	335	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	68	238	-	-	642	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	386	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.7	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	211	642	-
HCM Lane V/C Ratio	-	-	0.176	0.017	-
HCM Control Delay (s)	-	-	25.7	10.7	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection						
Int Delay, s/veh	0.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	10	1025	85	15	845
Future Vol, veh/h	30	10	1025	85	15	845
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	50	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	14	5	0	0	3
Mvmt Flow	33	11	1114	92	16	918

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2064	1114	0	0	1206	0
Stage 1	1114	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Critical Hdwy	6.4	6.34	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.426	-	-	2.2	-
Pot Cap-1 Maneuver	61	240	-	-	586	-
Stage 1	317	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	59	240	-	-	586	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	317	-	-	-	-	-
Stage 2	369	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.8	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	194	586	-
HCM Lane V/C Ratio	-	-	0.224	0.028	-
HCM Control Delay (s)	-	-	28.8	11.3	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	45	70	265	25	75	50	1145	95	65	910	15
Future Volume (vph)	35	45	70	265	25	75	50	1145	95	65	910	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1693	1406	1564	1495		1630	3164		1614	3220	
Flt Permitted		0.98	1.00	0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1693	1406	1564	1495		1630	3164		1614	3220	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	38	48	75	285	27	81	54	1231	102	70	978	16
RTOR Reduction (vph)	0	0	68	0	26	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	86	7	199	168	0	54	1328	0	70	993	0
Confl. Peds. (#/hr)	4		4	4		4	7		2	2		7
Heavy Vehicles (%)	0%	2%	4%	1%	0%	2%	2%	4%	0%	3%	3%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		9.8	9.8	18.7	18.7		6.1	54.9		8.1	56.9	
Effective Green, g (s)		10.3	10.3	19.2	19.2		6.6	55.9		8.6	57.9	
Actuated g/C Ratio		0.09	0.09	0.17	0.17		0.06	0.51		0.08	0.53	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)		2.5	2.5	2.5	2.5		2.5	5.1		2.5	5.1	
Lane Grp Cap (vph)		158	131	272	260		97	1607		126	1694	
v/s Ratio Prot		c0.05		c0.13	0.11		0.03	c0.42		c0.04	0.31	
v/s Ratio Perm			0.00									
v/c Ratio		0.54	0.05	0.73	0.65		0.56	0.83		0.56	0.59	
Uniform Delay, d1		47.6	45.4	43.0	42.3		50.3	22.9		48.9	17.8	
Progression Factor		1.00	1.00	1.00	1.00		1.09	1.17		1.00	1.00	
Incremental Delay, d2		3.0	0.1	9.2	4.8		4.7	4.3		4.2	1.5	
Delay (s)		50.6	45.5	52.1	47.1		59.4	31.0		53.1	19.3	
Level of Service		D	D	D	D		E	C		D	B	
Approach Delay (s)		48.2			49.7			32.2			21.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	15	20	25	10	45	10	1290	15	15	1215	20
Future Volume (veh/h)	65	15	20	25	10	45	10	1290	15	15	1215	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1709	1709
Adj Flow Rate, veh/h	68	16	21	26	11	47	11	1358	16	16	1279	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	3	0	3	3
Cap, veh/h	143	30	30	78	35	90	25	2535	30	31	2533	42
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.03	1.00	1.00	0.02	0.78	0.77
Sat Flow, veh/h	888	300	297	353	349	893	1667	3286	39	1667	3268	54
Grp Volume(v), veh/h	105	0	0	84	0	0	11	671	703	16	635	665
Grp Sat Flow(s),veh/h/ln	1484	0	0	1595	0	0	1667	1624	1701	1667	1624	1698
Q Serve(g_s), s	2.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	1.0	15.9	15.9
Cycle Q Clear(g_c), s	7.4	0.0	0.0	5.4	0.0	0.0	0.7	0.0	0.0	1.0	15.9	15.9
Prop In Lane	0.65		0.20	0.31		0.56	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	197	0	0	196	0	0	25	1253	1312	31	1259	1316
V/C Ratio(X)	0.53	0.00	0.00	0.43	0.00	0.00	0.44	0.54	0.54	0.52	0.50	0.51
Avail Cap(c_a), veh/h	391	0	0	396	0	0	91	1253	1312	91	1259	1316
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.59	0.59	0.59	0.78	0.78	0.78
Uniform Delay (d), s/veh	48.0	0.0	0.0	47.1	0.0	0.0	52.9	0.0	0.0	53.5	4.6	4.6
Incr Delay (d2), s/veh	1.7	0.0	0.0	1.1	0.0	0.0	5.3	1.0	0.9	7.5	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	2.3	0.0	0.0	0.3	0.3	0.3	0.5	4.3	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	0.0	0.0	48.2	0.0	0.0	58.2	1.0	0.9	61.0	5.7	5.7
LnGrp LOS	D	A	A	D	A	A	E	A	A	E	A	A
Approach Vol, veh/h		105			84			1385			1316	
Approach Delay, s/veh		49.6			48.2			1.4			6.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	89.3		15.1	6.0	88.9		15.1				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	5.5	65.0		25.5	5.5	65.0		25.5				
Max Q Clear Time (g_c+I1), s	2.7	17.9		7.4	3.0	2.0		9.4				
Green Ext Time (p_c), s	0.0	30.6		0.3	0.0	39.7		0.4				

Intersection Summary			
HCM 6th Ctrl Delay			6.8
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	30	25	75	15	35	30	1255	20	20	1190	25
Future Volume (veh/h)	75	30	25	75	15	35	30	1255	20	20	1190	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1750	1709	1709	1750	1695	1695
Adj Flow Rate, veh/h	83	33	28	83	17	39	33	1394	22	22	1322	28
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	3	0	4	4
Cap, veh/h	116	46	39	117	24	55	48	1908	30	37	1860	39
Arrive On Green	0.10	0.12	0.10	0.10	0.12	0.10	0.01	0.19	0.19	0.04	1.00	1.00
Sat Flow, veh/h	945	376	319	963	197	452	1667	3271	52	1667	3225	68
Grp Volume(v), veh/h	144	0	0	139	0	0	33	691	725	22	660	690
Grp Sat Flow(s),veh/h/ln	1640	0	0	1613	0	0	1667	1624	1699	1667	1611	1682
Q Serve(g_s), s	9.3	0.0	0.0	9.2	0.0	0.0	2.2	44.0	44.1	1.4	0.0	0.0
Cycle Q Clear(g_c), s	9.3	0.0	0.0	9.2	0.0	0.0	2.2	44.0	44.1	1.4	0.0	0.0
Prop In Lane	0.58		0.19	0.60		0.28	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	202	0	0	196	0	0	48	947	991	37	929	970
V/C Ratio(X)	0.71	0.00	0.00	0.71	0.00	0.00	0.69	0.73	0.73	0.59	0.71	0.71
Avail Cap(c_a), veh/h	239	0	0	235	0	0	91	947	991	91	929	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.46	0.46	0.46	0.85	0.85	0.85
Uniform Delay (d), s/veh	47.1	0.0	0.0	47.3	0.0	0.0	54.0	36.3	36.3	52.0	0.0	0.0
Incr Delay (d2), s/veh	7.1	0.0	0.0	6.7	0.0	0.0	6.0	2.3	2.2	9.1	3.9	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.0	4.1	0.0	0.0	1.0	19.7	20.6	0.7	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	0.0	0.0	54.1	0.0	0.0	60.0	38.6	38.6	61.1	3.9	3.8
LnGrp LOS	D	A	A	D	A	A	E	D	D	E	A	A
Approach Vol, veh/h		144			139			1449			1372	
Approach Delay, s/veh		54.2			54.1			39.1			4.8	
Approach LOS		D			D			D			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	68.0		17.4	6.5	68.6		17.5
Change Period (Y+Rc), s	4.5	6.5		6.0	4.5	6.5		6.0
Max Green Setting (Gmax), s	5.5	53.5		14.0	5.5	53.5		14.0
Max Q Clear Time (g_c+I1), s	4.2	2.0		11.2	3.4	46.1		11.3
Green Ext Time (p_c), s	0.0	22.3		0.1	0.0	6.8		0.1

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	170	25	220	140	250	60	825	205	330	870	70
Future Volume (veh/h)	170	170	25	220	140	250	60	825	205	330	870	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	181	181	27	234	149	266	64	878	0	351	926	74
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	7	2	2	0	4	10	4	3	3
Cap, veh/h	217	232	35	265	337	276	88	1086		308	1445	115
Arrive On Green	0.13	0.16	0.15	0.17	0.20	0.20	0.05	0.34	0.00	0.19	0.48	0.47
Sat Flow, veh/h	1654	1467	219	1576	1723	1411	1667	3221	1367	1615	3039	243
Grp Volume(v), veh/h	181	0	208	234	149	266	64	878	0	351	495	505
Grp Sat Flow(s),veh/h/ln	1654	0	1685	1576	1723	1411	1667	1611	1367	1615	1624	1658
Q Serve(g_s), s	11.7	0.0	13.0	16.0	8.4	20.6	4.2	27.3	0.0	21.0	25.3	25.3
Cycle Q Clear(g_c), s	11.7	0.0	13.0	16.0	8.4	20.6	4.2	27.3	0.0	21.0	25.3	25.3
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	217	0	267	265	337	276	88	1086		308	772	788
V/C Ratio(X)	0.84	0.00	0.78	0.88	0.44	0.96	0.73	0.81		1.14	0.64	0.64
Avail Cap(c_a), veh/h	286	0	322	272	337	276	167	1086		308	772	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.60	0.60	0.60
Uniform Delay (d), s/veh	46.6	0.0	44.5	44.7	39.0	43.9	51.3	33.2	0.0	44.5	21.8	21.8
Incr Delay (d2), s/veh	13.7	0.0	8.9	26.2	0.9	44.4	8.2	6.5	0.0	83.8	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	6.1	8.1	3.6	10.6	1.9	11.6	0.0	15.6	10.1	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	0.0	53.4	70.9	39.9	88.3	59.5	39.7	0.0	128.3	24.2	24.3
LnGrp LOS	E	A	D	E	D	F	E	D		F	C	C
Approach Vol, veh/h		389			649			942	A		1351	
Approach Delay, s/veh		56.6			70.9			41.0			51.3	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	56.3	18.4	25.5	25.0	41.1	22.5	21.4
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	42.0	18.5	20.5	20.5	32.0	18.5	20.5
Max Q Clear Time (g_c+I1), s	6.2	27.3	13.7	22.6	23.0	29.3	18.0	15.0
Green Ext Time (p_c), s	0.0	9.3	0.2	0.0	0.0	2.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	52.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	20.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			↰↑↱			↰↑↱	
Traffic Vol, veh/h	10	15	15	10	10	105	10	950	10	45	1015	45
Future Vol, veh/h	10	15	15	10	10	105	10	950	10	45	1015	45
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	11	16	16	11	11	115	11	1044	11	49	1115	49

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1810	2348	621	1764	2367	539	1186	0	0	1066	0	0
Stage 1	1260	1260	-	1083	1083	-	-	-	-	-	-	-
Stage 2	550	1088	-	681	1284	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.78	6.5	6.94	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.78	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.78	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.64	4	3.32	2.2	-	-	2.24	-	-
Pot Cap-1 Maneuver	50	37	435	47	36	487	596	-	-	638	-	-
Stage 1	183	244	-	212	296	-	-	-	-	-	-	-
Stage 2	492	294	-	379	238	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	20	27	419	19	26	482	584	-	-	631	-	-
Mov Cap-2 Maneuver	20	27	-	19	26	-	-	-	-	-	-	-
Stage 1	171	185	-	200	279	-	-	-	-	-	-	-
Stage 2	343	278	-	253	181	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 376.6	235.5	0.4	1.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	584	-	-	37	111	631	-	-
HCM Lane V/C Ratio	0.019	-	-	1.188	1.238	0.078	-	-
HCM Control Delay (s)	11.3	0.3	-	$ 376.6	235.5	11.2	1.2	-
HCM Lane LOS	B	A	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	4.5	9	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	20	30	60	35	40	20	845	10	40	965	20
Future Volume (veh/h)	35	20	30	60	35	40	20	845	10	40	965	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.98		0.98	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1682	1682	1682	1695	1695	1695	1723	1723	1723
Adj Flow Rate, veh/h	36	21	31	62	36	41	21	871	10	41	995	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	5	5	5	4	4	4	2	2	2
Cap, veh/h	108	64	69	122	63	58	25	1103	13	53	1358	30
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.33	0.34	0.33	0.55	0.56	0.55
Sat Flow, veh/h	472	488	522	570	480	439	75	3263	39	127	3223	71
Grp Volume(v), veh/h	88	0	0	139	0	0	473	0	429	555	0	502
Grp Sat Flow(s),veh/h/ln	1482	0	0	1490	0	0	1692	0	1686	1716	0	1705
Q Serve(g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	28.3	0.0	24.9	27.5	0.0	23.4
Cycle Q Clear(g_c), s	5.9	0.0	0.0	9.6	0.0	0.0	28.3	0.0	24.9	27.5	0.0	23.4
Prop In Lane	0.41		0.35	0.45		0.29	0.04		0.02	0.07		0.04
Lane Grp Cap(c), veh/h	234	0	0	237	0	0	572	0	570	723	0	718
V/C Ratio(X)	0.38	0.00	0.00	0.59	0.00	0.00	0.83	0.00	0.75	0.77	0.00	0.70
Avail Cap(c_a), veh/h	307	0	0	307	0	0	615	0	613	723	0	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	0.0	45.7	0.0	0.0	33.5	0.0	32.3	20.1	0.0	19.2
Incr Delay (d2), s/veh	0.7	0.0	0.0	1.7	0.0	0.0	10.6	0.0	6.7	7.7	0.0	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	3.8	0.0	0.0	13.2	0.0	11.2	11.2	0.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	0.0	0.0	47.4	0.0	0.0	44.1	0.0	39.0	27.7	0.0	24.7
LnGrp LOS	D	A	A	D	A	A	D	A	D	C	A	C
Approach Vol, veh/h		88			139			902			1057	
Approach Delay, s/veh		44.9			47.4			41.7			26.3	
Approach LOS		D			D			D			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.3		18.5		41.2		18.5				
Change Period (Y+Rc), s		5.0		4.5		5.0		4.5				
Max Green Setting (Gmax), s		37.0		19.5		39.0		19.5				
Max Q Clear Time (g_c+I1), s		29.5		11.6		30.3		7.9				
Green Ext Time (p_c), s		5.6		0.3		5.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			34.7									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	50	10	0	25	25	1015	10	5	1080	15
Future Vol, veh/h	10	0	50	10	0	25	25	1015	10	5	1080	15
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	11	0	56	11	0	28	28	1128	11	6	1200	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1864	2437	622	1810	2440	588	1230	0	0	1147	0	0
Stage 1	1234	1234	-	1198	1198	-	-	-	-	-	-	-
Stage 2	630	1203	-	612	1242	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	46	32	434	50	32	457	551	-	-	616	-	-
Stage 1	190	251	-	200	261	-	-	-	-	-	-	-
Stage 2	441	260	-	452	249	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	40	29	429	41	29	449	544	-	-	611	-	-
Mov Cap-2 Maneuver	40	29	-	41	29	-	-	-	-	-	-	-
Stage 1	178	240	-	188	246	-	-	-	-	-	-	-
Stage 2	389	245	-	382	239	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.2	50.4	0.3	0.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	544	-	-	164	117	611	-	-
HCM Lane V/C Ratio	0.051	-	-	0.407	0.332	0.009	-	-
HCM Control Delay (s)	12	-	-	41.2	50.4	10.9	0.2	-
HCM Lane LOS	B	-	-	E	F	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.8	1.3	0	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	655	45	110	550	5	15	2	150	5	5	35
Future Vol, veh/h	10	655	45	110	550	5	15	2	150	5	5	35
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	11	689	47	116	579	5	16	2	158	5	5	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	585	0	0	737	0	0	1572	1553	715	1631	1574	584
Stage 1	-	-	-	-	-	-	736	736	-	815	815	-
Stage 2	-	-	-	-	-	-	836	817	-	816	759	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	1000	-	-	860	-	-	87	114	429	82	111	510
Stage 1	-	-	-	-	-	-	404	428	-	374	394	-
Stage 2	-	-	-	-	-	-	356	393	-	374	418	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	999	-	-	859	-	-	69	97	428	45	95	509
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	97	-	45	95	-
Stage 1	-	-	-	-	-	-	399	423	-	370	340	-
Stage 2	-	-	-	-	-	-	281	340	-	232	413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.6	36.3	29.4
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	284	999	-	-	859	-	-	194
HCM Lane V/C Ratio	0.619	0.011	-	-	0.135	-	-	0.244
HCM Control Delay (s)	36.3	8.6	-	-	9.8	-	-	29.4
HCM Lane LOS	E	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	3.8	0	-	-	0.5	-	-	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱		↰	↱		✥	
Traffic Volume (veh/h)	45	725	115	60	500	135	90	60	65	135	55	35
Future Volume (veh/h)	45	725	115	60	500	135	90	60	65	135	55	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1750	1750	1750
Adj Flow Rate, veh/h	49	788	125	65	543	147	98	65	71	147	60	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	0	0	0
Cap, veh/h	78	1317	209	94	808	663	304	180	439	255	98	50
Arrive On Green	0.05	0.47	0.45	0.06	0.47	0.47	0.30	0.31	0.31	0.30	0.31	0.30
Sat Flow, veh/h	1537	2830	449	1628	1709	1402	724	588	1430	565	321	163
Grp Volume(v), veh/h	49	456	457	65	543	147	163	0	71	245	0	0
Grp Sat Flow(s),veh/h/ln	1537	1637	1642	1628	1709	1402	1311	0	1430	1048	0	0
Q Serve(g_s), s	2.2	14.6	14.7	2.8	17.4	4.4	0.0	0.0	2.6	10.1	0.0	0.0
Cycle Q Clear(g_c), s	2.2	14.6	14.7	2.8	17.4	4.4	6.9	0.0	2.6	16.9	0.0	0.0
Prop In Lane	1.00		0.27	1.00		1.00	0.60		1.00	0.60		0.16
Lane Grp Cap(c), veh/h	78	762	764	94	808	663	475	0	439	396	0	0
V/C Ratio(X)	0.63	0.60	0.60	0.69	0.67	0.22	0.34	0.00	0.16	0.62	0.00	0.00
Avail Cap(c_a), veh/h	130	1041	1045	138	1087	892	866	0	829	776	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.9	14.0	14.1	32.7	14.4	11.0	19.3	0.0	17.9	24.8	0.0	0.0
Incr Delay (d2), s/veh	6.0	2.9	2.9	6.4	3.7	0.6	0.3	0.0	0.1	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.4	5.5	1.2	6.8	1.3	2.1	0.0	0.8	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	16.9	17.0	39.1	18.1	11.6	19.7	0.0	18.0	26.4	0.0	0.0
LnGrp LOS	D	B	B	D	B	B	B	A	B	C	A	A
Approach Vol, veh/h		962			755			234			245	
Approach Delay, s/veh		18.1			18.7			19.2			26.4	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	36.9		25.7	7.6	37.4		25.7
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5
Max Green Setting (Gmax), s	5.5	44.0		40.5	5.5	44.0		40.5
Max Q Clear Time (g_c+I1), s	4.8	16.7		18.9	4.2	19.4		8.9
Green Ext Time (p_c), s	0.0	15.3		1.6	0.0	10.6		1.0

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	35	0	35	0	85	70	15	75	0
Future Vol, veh/h	0	0	0	35	0	35	0	85	70	15	75	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	7	0	0	0	0	0	0	2	0
Mvmt Flow	0	0	0	43	0	43	0	105	86	19	93	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	301	323	93	280	280	149	93	0	0	192	0	0
Stage 1	131	131	-	149	149	-	-	-	-	-	-	-
Stage 2	170	192	-	131	131	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.17	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.563	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	655	598	970	662	632	903	1514	-	-	1394	-	-
Stage 1	877	792	-	842	778	-	-	-	-	-	-	-
Stage 2	837	745	-	861	792	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	617	589	970	654	623	902	1514	-	-	1393	-	-
Mov Cap-2 Maneuver	617	589	-	654	623	-	-	-	-	-	-	-
Stage 1	877	781	-	841	777	-	-	-	-	-	-	-
Stage 2	797	744	-	849	781	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.4	0	1.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1514	-	-	-	758	1393	-	-
HCM Lane V/C Ratio	-	-	-	-	0.114	0.013	-	-
HCM Control Delay (s)	0	-	-	0	10.4	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0	-	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	25	2	10	20	5	15	70	45	10	45	5
Future Vol, veh/h	2	25	2	10	20	5	15	70	45	10	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	31	3	13	25	6	19	88	56	13	56	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	34	0	0	125	96	35	167	94	29
Stage 1	-	-	-	-	-	-	39	39	-	54	54	-
Stage 2	-	-	-	-	-	-	86	57	-	113	40	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1595	-	-	1591	-	-	854	798	1044	802	800	1052
Stage 1	-	-	-	-	-	-	981	866	-	963	854	-
Stage 2	-	-	-	-	-	-	927	851	-	897	866	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1595	-	-	1591	-	-	796	790	1042	688	792	1051
Mov Cap-2 Maneuver	-	-	-	-	-	-	796	790	-	688	792	-
Stage 1	-	-	-	-	-	-	979	864	-	961	847	-
Stage 2	-	-	-	-	-	-	853	844	-	760	864	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	2.1	10.1	10
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	863	1595	-	-	1591	-	-	788
HCM Lane V/C Ratio	0.188	0.002	-	-	0.008	-	-	0.095
HCM Control Delay (s)	10.1	7.3	0	-	7.3	0	-	10
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.3

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	45	115	20	35	0	105	0	30	0	1	0
Future Vol, veh/h	1	45	115	20	35	0	105	0	30	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	1	0	0	0	0	0
Mvmt Flow	1	51	129	22	39	0	118	0	34	0	1	0
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	7.9	8	9	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	1%	36%	0%
Vol Thru, %	0%	0%	28%	64%	100%
Vol Right, %	0%	100%	71%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	30	161	55	1
LT Vol	105	0	1	20	0
Through Vol	0	0	45	35	1
RT Vol	0	30	115	0	0
Lane Flow Rate	118	34	181	62	1
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.182	0.041	0.198	0.078	0.001
Departure Headway (Hd)	5.553	4.33	3.949	4.558	4.714
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	650	832	912	788	759
Service Time	3.253	2.03	1.963	2.576	2.741
HCM Lane V/C Ratio	0.182	0.041	0.198	0.079	0.001
HCM Control Delay	9.5	7.2	7.9	8	7.7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.7	0.1	0.7	0.3	0

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	45	10	2	60	20	15	180	15	15	80	60
Future Vol, veh/h	10	45	10	2	60	20	15	180	15	15	80	60
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	11	51	11	2	68	23	17	205	17	17	91	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	95	0	0	77	0	0	259	193	83	289	187	86
Stage 1	-	-	-	-	-	-	94	94	-	88	88	-
Stage 2	-	-	-	-	-	-	165	99	-	201	99	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.16	6.52	6.43	7.1	6.56	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.1	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.1	5.56	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.554	4.018	3.507	3.5	4.054	3.3
Pot Cap-1 Maneuver	1512	-	-	1535	-	-	686	702	921	667	700	978
Stage 1	-	-	-	-	-	-	903	817	-	925	814	-
Stage 2	-	-	-	-	-	-	828	813	-	805	805	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1506	-	-	1513	-	-	560	683	898	492	681	972
Mov Cap-2 Maneuver	-	-	-	-	-	-	560	683	-	492	681	-
Stage 1	-	-	-	-	-	-	883	799	-	914	810	-
Stage 2	-	-	-	-	-	-	682	809	-	577	787	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.2	13.1	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	684	1506	-	-	1513	-	-	739
HCM Lane V/C Ratio	0.349	0.008	-	-	0.002	-	-	0.238
HCM Control Delay (s)	13.1	7.4	0	-	7.4	0	-	11.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.6	0	-	-	0	-	-	0.9

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	30	10	1	55	35	15	70	10	30	40	15
Future Vol, veh/h	20	30	10	1	55	35	15	70	10	30	40	15
Conflicting Peds, #/hr	23	0	27	27	0	23	8	0	34	34	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	3	0	4	0	6	0	7
Mvmt Flow	24	36	12	1	66	42	18	84	12	36	48	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	131	0	0	75	0	0	247	250	103	284	235	118
Stage 1	-	-	-	-	-	-	117	117	-	112	112	-
Stage 2	-	-	-	-	-	-	130	133	-	172	123	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.54	6.2	7.16	6.5	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.54	-	6.16	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.54	-	6.16	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.036	3.3	3.554	4	3.363
Pot Cap-1 Maneuver	1467	-	-	1537	-	-	711	649	957	660	669	921
Stage 1	-	-	-	-	-	-	892	795	-	883	807	-
Stage 2	-	-	-	-	-	-	878	782	-	821	798	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1435	-	-	1497	-	-	625	607	902	543	626	894
Mov Cap-2 Maneuver	-	-	-	-	-	-	625	607	-	543	626	-
Stage 1	-	-	-	-	-	-	855	761	-	849	788	-
Stage 2	-	-	-	-	-	-	801	764	-	685	764	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0.1	12	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	632	1435	-	-	1497	-	-	625
HCM Lane V/C Ratio	0.181	0.017	-	-	0.001	-	-	0.164
HCM Control Delay (s)	12	7.6	0	-	7.4	0	-	11.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0	-	-	0.6

Intersection						
Int Delay, s/veh	4.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	50	85	95	95	120	40
Future Vol, veh/h	50	85	95	95	120	40
Conflicting Peds, #/hr	2	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	100	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	0	0	3	3	8
Mvmt Flow	56	94	106	106	133	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	453	142	133	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	561	911	1464	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	903	1464	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	732	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	11.4		3.8		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1464	-	710	-	-
HCM Lane V/C Ratio	0.072	-	0.211	-	-
HCM Control Delay (s)	7.7	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	-	-

	use dropdown	use dropdown	use dropdown	use dropdown			BEGIN	1	3	4	5	6	7	8	9	10	11	12	13	14		Critical Flow Calculator									
Intersection ID and Name	**NB PhasingType**	**SB PhasingType**	**EB PhasingType**	**WB PhasingType**	**Cycle Length**	**Lost Time**	CALCULATIONS		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**WBL/EBT**	**EBL/WBT**	**NBL/SBT**	**SBL/NBT**	**V/S E/W**	**V/S N/S**	**Intersection V/C**	**HCM 6th Ctrl Delay**	**HCM 6th LOS**	**Synchro ID**
2: US 101 & Lighthouse Dr/52nd St	Protected	Protected	Permitted	Permitted	125	12		Adj Flow Rate, veh/h	32	5	79	89	0	16	47	963	0	32	758	0	Protected	0.23	0.01	0.48	0.59						
								Sat Flow, veh/h	0	22	1458	0	0	1470	1615	1682	1483	1667	1695	1483	Permitted or Split	0.23	0.01	0.45	0.57						
								V/S	0.00	0.23	0.05	0.00	0.00	0.01	0.03	0.57	0.00	0.02	0.45	0.00	selected phasing	0.23	0.01	0.48	0.59	0.23	0.59	**0.91**	**37.3**	**D**	2
7: US 101 & 11th St	Protected	Protected	Permitted	Permitted	120	12		Adj Flow Rate, veh/h	68	16	21	26	11	47	11	1358	16	16	1279	21	Protected	0.14	0.13	0.40	0.42						
								Sat Flow, veh/h	888	300	297	353	349	893	1667	3286	39	1667	3268	54	Permitted or Split	0.08	0.07	0.39	0.41						
								V/S	0.08	0.05	0.07	0.07	0.03	0.05	0.01	0.41	0.41	0.01	0.39	0.39	selected phasing	0.08	0.07	0.40	0.42	0.08	0.42	**0.55**	**6.8**	**A**	7
8: US 101 & 6th St	Protected	Protected	Split	Split	120	16		Adj Flow Rate, veh/h	83	33	28	83	17	39	33	1394	22	22	1322	28	Protected	0.17	0.17	0.43	0.44						
								Sat Flow, veh/h	945	376	319	963	197	452	1667	3271	52	1667	3225	68	Permitted or Split	0.09	0.09	0.41	0.43						
								V/S	0.09	0.09	0.09	0.09	0.09	0.09	0.02	0.43	0.42	0.01	0.41	0.41	selected phasing	0.09	0.09	0.43	0.44	0.17	0.44	**0.71**	**25.3**	**C**	8
9: US 101 & Olive St/US 20	Protected	Protected	Protected	Protected	120	16		Adj Flow Rate, veh/h	181	181	27	234	149	266	64	878	0	351	926	74	Protected	0.27	0.30	0.34	0.49						
								Sat Flow, veh/h	1654	1467	219	1576	1723	1411	1667	3221	1367	1615	3039	243	Permitted or Split	0.12	0.19	0.30	0.27						
								V/S	0.11	0.12	0.12	0.15	0.09	0.19	0.04	0.27	0.00	0.22	0.30	0.30	selected phasing	0.27	0.30	0.34	0.49	0.30	0.49	**0.91**	**52.8**	**D**	9
11: US 101 & Hurbert St	Split	Split	Permitted	Permitted	120	12		Adj Flow Rate, veh/h	36	21	31	62	36	41	21	871	10	41	995	21	Protected	0.17	0.17	0.59	0.59						
								Sat Flow, veh/h	472	488	522	570	480	439	75	3263	39	127	3223	71	Permitted or Split	0.08	0.11	0.32	0.28						
								V/S	0.08	0.04	0.06	0.11	0.08	0.09	0.28	0.27	0.26	0.32	0.31	0.30	selected phasing	0.08	0.11	0.32	0.28	0.11	0.60	**0.79**	**34.7**	**C**	11
14: Moore Dr/Harney St & US 20	Permitted	Permitted	Protected	Protected	104	12		Adj Flow Rate, veh/h	49	788	125	65	543	147	98	65	71	147	60	38	Protected	0.32	0.35	0.37	0.37						
								Sat Flow, veh/h	1537	2830	449	1628	1709	1402	724	588	1430	565	321	163	Permitted or Split	0.28	0.32	0.26	0.14						
								V/S	0.03	0.28	0.28	0.04	0.32	0.10	0.14	0.11	0.05	0.26	0.19	0.23	selected phasing	0.32	0.35	0.26	0.14	0.35	0.26	**0.69**	**19.3**	**B**	14
								Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	
								Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	
								Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	

Sheet Description:
This sheet reads in the adjusted flow rate and the saturation flow rate from Synchro and divides them to calculated the V/S for each movement.
The critical flow calculator calculates the critical v/s for each conflicting phase pair.
for protected phases, this v/s is the left turn v/s plus the max of the opposing movement v/s
for the permitted and split phases, this v/s is the max of the three movement v/s
The next step selects the proper v/s based on phasing provided
V/S by east-west and north-south is selected by taking the max of the phase pairs or by adding them (if split phasing)
If overlap calculator was selected in input section and overlap phases were indicated, then overlap v/s for intersection is calculated. See details below
If the right turn v/s is greater than the through v/s for the right turn overlap approach, then the right turn is assumed the critical movement and intersection v/c calc will use the v/s overlap instead of approach v/s
The final step in v/c calculation uses the approach v/s ratios, cycle length, and lost time to calculate overall intersection v/c
Delay and LOS are read directly from the HCM 6 report

Overlap Calculator Details
Overlap calculator reads in whether an overlap phase is in use and what type of phasing is associated with the right turn approach and the overlapped approach
V/S is read in for right turn movement, and remaining approaches from previous calculations
-right turn overlap v/s is just the v/s for the right turn movement (i.e. NBR)
-right turn approach v/s is the critical v/s associated with the right turn approaches (i.e. NB/SB) and is calculated differently for protected vs split
-overlap approach v/s is the critical v/s associated with the overlap approaches (i.e. EB/WB) and is calculated differently for protected vs split phasing
The v/s overlap column sums the 3 v/s values for the overlap phasing to get the total v/s overlap to be used in the v/c calculation
If there are overlaps for multiple approaches, the v/s overlap will use the greatest of the approaches for most conservative approach
Use Overlap Calculator' must be enabled and 'Use OV V/S' must be showing in V/S Overlap column in order for overlap v/s to be used in final v/c calculation

	use dropdown	BEGIN	Sat. Flow Default	1700	1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
Intersection ID and Name	**Control Type**	CALCULATIONS	**Major Approach**	**Row Reference**		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**NB**	**SB**	**EB**	**WB**	**Synchro ID**
1: US 101 & 73rd Ct/73rd St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	1: US 101 & 73rd Ct/73rd St V/C	**0.46**	**0.35**	**0.02**	**0.92**	**1**
				8	Lane Configurations	0	1	0	0	1	0	1	1	1	1	1	0	1: US 101 & 73rd Ct/73rd St Delay	**8.70**	**11.50**	**17.10**	**130.20**	
				19	Mvmt Flow	1	0	5	95	0	16	2	774	53	21	600	2	1: US 101 & 73rd Ct/73rd St LOS	**A**	**B**	**C**	**F**	
				10	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	L	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C		0.00	0.00		0.01	0.01	0.00	0.46	0.03	0.04	0.35	0.35						
					Minor (or AWSC) V/C	0.02			0.92														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.00	-	-	0.02	0.92	0.04	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	8.7	-	-	17.1	130.2	11.5	-	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	-	-	C	F	B	-	-	0	0	0						
3: US 101 & Oceanview Dr	TWSC		NB/SB	7	Movement	EBL		EBR				NBL	NBT			SBT	SBR	3: US 101 & Oceanview Dr V/C	**0.64**	**0.52**	**0.57**	**0.00**	**3**
				8	Lane Configurations	1		0				1	1			1	1	3: US 101 & Oceanview Dr Delay	**10.30**	**0.00**	**42.50**	**0.00**	
				19	Mvmt Flow	90	0	32	0	0	0	21	1080	0	0	888	48	3: US 101 & Oceanview Dr LOS	**B**	**A**	**E**	**A**	
				67	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C							0.03	0.64			0.52	0.03						
					Minor (or AWSC) V/C	0.57																	
				45	Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.03	-	0.57	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	10.3	-	42.5	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	E	-	-	0	0	0	0	0	0						
4: US 101 & 36th Street	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		4: US 101 & 36th Street V/C	**0.63**	**0.53**	**0.00**	**0.18**	**4**
				8	Lane Configurations				1		0		1	1	1	1		4: US 101 & 36th Street Delay	**0.00**	**10.70**	**0.00**	**25.70**	
				19	Mvmt Flow	0	0	0	21	0	16	0	1064	37	11	894	0	4: US 101 & 36th Street LOS	**A**	**B**	**A**	**D**	
				127	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.63	0.02	0.02	0.53							
					Minor (or AWSC) V/C				0.18														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.18	0.02	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	25.7	10.7	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	D	B	-	0	0	0	0	0	0						
5: US 101 & 31st St	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		5: US 101 & 31st St V/C	**0.66**	**0.54**	**0.00**	**0.22**	**5**
				8	Lane Configurations				1		0		1	1	1	1		5: US 101 & 31st St Delay	**0.00**	**11.30**	**0.00**	**28.80**	
				19	Mvmt Flow	0	0	0	33	0	11	0	1114	92	16	918	0	5: US 101 & 31st St LOS	**A**	**B**	**A**	**D**	
				184	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.66	0.05	0.03	0.54							
					Minor (or AWSC) V/C				0.22														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.22	0.03	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	28.8	11.3	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	D	B	-	0	0	0	0	0	0						
10: US 101 & Angle St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	10: US 101 & Angle St V/C	**0.33**	**0.41**	**1.19**	**1.24**	**10**
				8	Lane Configurations	0	1	0	0	1	0	0	2	0	0	2	0	10: US 101 & Angle St Delay	**11.30**	**11.20**	**376.60**	**235.50**	
				19	Mvmt Flow	11	16	16	11	11	115	11	1044	11	49	1115	49	10: US 101 & Angle St LOS	**B**	**B**	**F**	**F**	
				241	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.02	0.02		0.07	0.07	0.33	0.31	0.31	0.41	0.34	0.34						
					Minor (or AWSC) V/C	1.19			1.24														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.02	-	-	1.19	1.24	0.08	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	11.3	0.3	-	376.6	235.5	11.2	1.2	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	A	-	F	F	B	A	-	0	0	0						
12: US 101 & Bayley St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	12: US 101 & Bayley St V/C	**0.34**	**0.36**	**0.41**	**0.33**	**12**
				8	Lane Configurations	0	1	0	0	1	0	1	2	0	0	2	0	12: US 101 & Bayley St Delay	**12.00**	**10.90**	**41.20**	**50.40**	
				19	Mvmt Flow	11	0	56	11	0	28	28	1128	11	6	1200	17	12: US 101 & Bayley St LOS	**B**	**B**	**E**	**F**	
				301	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.03	0.03		0.02	0.02	0.05	0.34	0.34	0.36	0.36	0.36						
					Minor (or AWSC) V/C	0.41			0.33														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.05	-	-	0.41	0.33	0.01	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	12.0	-	-	41.2	50.4	10.9	0.2	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	-	E	F	B	A	-	0	0	0						
13: Benton St & US 20	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	13: Benton St & US 20 V/C	**0.62**	**0.24**	**0.43**	**0.34**	**13**
				8	Lane Configurations	1	1	0	1	1	0	0	1	0	0	1	0	13: Benton St & US 20 Delay	**36.30**	**29.40**	**8.60**	**9.80**	
				19	Mvmt Flow	11	689	47	116	579	5	16	2	158	5	5	37	13: Benton St & US 20 LOS	**E**	**D**	**A**	**A**	
				358	Major V/C Lanes	L	T or TR	TR or R	L	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.01	0.43	0.43	0.14	0.34	0.34		0.09	0.09		0.02	0.02						
					Minor (or AWSC) V/C							0.62			0.24								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.62	0.01	-	-	0.14	-	-	0.24	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	36.3	8.6	-	-	9.8	-	-	29.4	0.0	0.0	0.0						
				49	HCM Lane LOS	0	E	A	-	-	A	-	-	D	0	0	0						
15: Oceanview Dr & Pacific Pl/25th St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	15: Oceanview Dr & Pacific Pl/25th St V/C	**0.11**	**0.07**	**0.00**	**0.11**	**15**
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	15: Oceanview Dr & Pacific Pl/25th St Delay	**0.00**	**7.60**	**0.00**	**10.40**	

Intersection ID and Name	Control Type	BEGIN CALCULATIONS	Major Approach	Row Reference	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Outputs	NB	SB	EB	WB	Synchro ID
	use dropdown	BEGIN	Sat. Flow Default	1700 1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
				19 Mvmt Flow	0	0	0	43	0	43	0	105	86	19	93	0	15: Oceanview Dr & Pacific Pl/25th St LOS	A	A	A	B	
				415 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C		0.00	0.00		0.03	0.03		0.11	0.11	0.07	0.05	0.05						
				Minor (or AWSC) V/C	-			0.11														
				45 Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47 HCM Lane V/C Ratio	0.00	-	-	-	-	0.11	0.01	-	-	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	0.0	-	-	0.0	10.4	7.6	0.0	-	0.0	0.0	0.0						
				49 HCM Lane LOS	0	A	-	-	A	B	A	A	-	0	0	0						
16: Nye St & 11th St	TWSC		EB/WB	7 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	16: Nye St & 11th St V/C	0.19	0.10	0.02	0.03	16
				8 Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	16: Nye St & 11th St Delay	10.10	10.00	7.30	7.30	
				19 Mvmt Flow	3	31	3	13	25	6	19	88	56	13	56	6	16: Nye St & 11th St LOS	B	B	A	A	
				472 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C	0.02	0.02	0.02	0.03	0.02	0.02		0.08	0.08		0.04	0.04						
				Minor (or AWSC) V/C							0.19			0.10								
				45 Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.19	0.00	-	-	0.01	-	-	0.10	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	10.1	7.3	0.0	-	7.3	0.0	-	10.0	0.0	0.0	0.0						
				49 HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
17: Harney St & 7th St	AWSC		N/A	9 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	17: Harney St & 7th St V/C	0.18	0.00	0.20	0.08	17
				10 Lane Configurations	0	1	0	0	1	0	0	1	1	0	1	0	17: Harney St & 7th St Delay	9.50	7.70	7.90	8.00	
				15 Mvmt Flow	1	51	129	22	39	0	118	0	34	0	1	0	17: Harney St & 7th St LOS	A	A	A	A	
				531 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LT	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C		0.11	0.11		0.02	0.02		0.00	0.02		0.00	0.00						
				Minor (or AWSC) V/C	0.20			0.08			0.18	0.04		0.00								
				29 Lane	0	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	0	0	0	0	0	0						
				45 HCM Lane V/C Ratio	0.00	0.18	0.04	0.20	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
				46 HCM Control Delay	0.0	9.5	7.2	7.9	8.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0						
				47 HCM Lane LOS	0	A	A	A	A	A	0	0	0	0	0	0						
18: 9th St & Hurbert St	TWSC		EB/WB	7 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	18: 9th St & Hurbert St V/C	0.35	0.24	0.04	0.06	18
				8 Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	18: 9th St & Hurbert St Delay	13.10	11.40	7.40	7.40	
				19 Mvmt Flow	11	51	11	2	68	23	17	205	17	17	91	68	18: 9th St & Hurbert St LOS	B	B	A	A	
				584 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C	0.04	0.04	0.04	0.06	0.05	0.05		0.13	0.13		0.09	0.09						
				Minor (or AWSC) V/C							0.35			0.24								
				45 Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.35	0.01	-	-	0.00	-	-	0.24	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	13.1	7.4	0.0	-	7.4	0.0	-	11.4	0.0	0.0	0.0						
				49 HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
19: 9th St & Abbey St	TWSC		EB/WB	7 Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	19: 9th St & Abbey St V/C	0.18	0.16	0.05	0.06	19
				8 Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	19: 9th St & Abbey St Delay	12.00	11.90	7.60	7.40	
				19 Mvmt Flow	24	36	12	1	66	42	18	84	12	36	48	18	19: 9th St & Abbey St LOS	B	B	A	A	
				641 Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
				Major V/C	0.05	0.03	0.03	0.06	0.06	0.06		0.06	0.06		0.04	0.04						
				Minor (or AWSC) V/C							0.18			0.16								
				45 Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.18	0.02	-	-	0.00	-	-	0.16	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	12.0	7.6	0.0	-	7.4	0.0	-	11.9	0.0	0.0	0.0						
				49 HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
20: Bay Blvd & Moore Dr	TWSC		NB/SB	7 Movement	EBL		EBR				NBL	NBT			SBT	SBR	20: Bay Blvd & Moore Dr V/C	0.07	0.08	0.21	0.00	20
				8 Lane Configurations	1		0				1	1			1	1	20: Bay Blvd & Moore Dr Delay	7.70	0.00	11.40	0.00	
				19 Mvmt Flow	56	0	94	0	0	0	106	106	0	0	133	44	20: Bay Blvd & Moore Dr LOS	A	A	B	A	
				698 Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
				Major V/C							0.07	0.06			0.08	0.03						
				Minor (or AWSC) V/C	0.21																	
				45 Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47 HCM Lane V/C Ratio	0.00	0.07	-	0.21	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48 HCM Control Delay (s)	0.0	7.7	-	11.4	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49 HCM Lane LOS	0	A	-	B	-	-	0	0	0	0	0	0						

Sheet Description:

This sheet reads in lane configurations by representing exclusive through or shared lanes with the number of lanes in the through movement, and any exclusive number of turn lanes in the respective turn movement. So a single LTR lane would have 1 under through and 0s under left and right.

This sheet also reads in movement flow and select v/c, LOS, and delay results. The calculations are shown in the box.

Calculations are split out by major and minor approach v/c; Major approach is determined from free approaches in report

The major v/c lanes row indicates the left turn lane configuration for each approach. This is important to determine how to add in the delay from the left turns to the overall calculated v/c for the major approach

In the major v/c row, left turn v/c is read from the report, while remaining movement v/c ratios are calculated based on the methodology given in the ODOT APM and the provided default saturation flow rate of 1700 (can be changed by user)

In the minor v/c row, v/c ratios by lane are calculated based on the ODOT APM method using volume and assumed saturation flow rate

The v/c ratio by approach is the max of the v/c by lane as calculated in the major or minor v/c rows

LOS and Delay by approach are read in from the report

For AWSC, all approaches are treated as minor approaches and the calculations remain the same

The summary table selects the worst approach for both directions and concatenates the results with a / for the final summary table for TWSC. For AWSC, the overall worst approach is reported.

APPENDIX H- TECHNICAL MEMORANDUM #8: SOLUTIONS EVALUATION

SOLUTIONS EVALUATION MEMORANDUM

DATE: July 30, 2021

TO: Derrick Tokos | City of Newport

James Feldman | ODOT

FROM: Rochelle Starrett, Kevin Chewuk, Carl Springer | DKS

SUBJECT: Newport TSP Update

Technical Memorandum #8: Solutions Evaluation

Project #17081-007

This memo summarizes the preliminary transportation solutions identified for the City of Newport. The recommended solutions respond to system performance issues identified through the public outreach process, the prior technical analysis by the consultant team, and on-going feedback and reviews by city staff, the Project Advisory Committee, and the Project Management Team. The system solutions identified include pedestrian and bicycle enhancements along with minor roadway capacity improvements for motor vehicles. In addition, a more in-depth evaluation was made regarding several major roadway improvement concepts to help understand the trade-offs, expected benefits and potential risks of implementing each alternative major solution. This deeper technical review considered solutions along the US 101 and US 20 in the downtown core area, as well as a possible Harney Street extension to establish a new circulation route between US 20 and US 101 near NE 36th Street.

While projects documented in this memo are needed to develop a future, multimodal transportation system for Newport, funding will not be available to construct all recommended capital improvements. Evaluation criteria, that will be used to rank and prioritize transportation improvements at a later date, are also provided. The recommended evaluation criteria and project cost estimates will be used to develop a financially constrained project list as part of Task 5.10. The projects presented in this memo are still preliminary and will be refined prior to implementation of the Transportation System Plan (TSP). Furthermore, inclusion of a project in this memo does not commit the City of Newport to its ultimate construction.

APPROACH TO DEVELOPING NETWORK IMPROVEMENTS

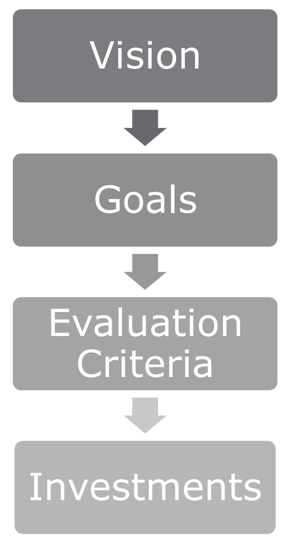
Newport's approach to developing transportation projects emphasized improved system efficiency and management over adding capacity. The approach considered four tiers of priorities that included:

1. Highest Priority – preserve the function of the system through management practices such as improved traffic signal operations, encouraging alternative modes of travel, and implementation of new policies and standards.

2. High Priority – improve existing facility efficiency through minor enhancement projects that upgrade roads to desired standards, fill important system connectivity gaps, or include safety improvements to intersections and corridors.

3. Moderate Priority – add capacity to the system by widening, constructing major improvements to existing roadways, or extending existing roadways to create parallel routes to congested corridors.

4. Lowest Priority – add capacity to the system by constructing new facilities.



The project team recommended higher priority solution types to address identified needs unless a lower priority solution was clearly more cost-effective or better supported the goals and objectives of the City. This process allowed the City to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel.

Measurable evaluation criteria were developed based on Newport's transportation goals and objectives (see Technical Memorandum #4: Goals and Objectives). These evaluation criteria will be used to screen and prioritize transportation solutions in the next phase of the solutions evaluation process. The prioritized solutions, consequently, will be consistent with the goals and objectives. The identified evaluation criteria will also consider available funding sources to help prioritize projects. The next phase of the solutions evaluation process will include project cost estimates and potential funding sources. For projects within Newport's Urban Renewal District boundaries, a lower priority project may be advanced over a higher priority project located outside the district due to specific funding constraints.

EVALUATION CRITERIA

Newport's evaluation criteria were developed from the city's specific transportation goals and objectives (see Technical Memorandum #4: Goals and Objectives) to screen and prioritize transportation solutions. The recommended evaluation criteria for each goal is summarized below in Table 1. Details for how each evaluation criteria will be applied to a transportation project is provided in Appendix 1.

TABLE 1: RECOMMENDED EVALUATION CRITERIA			
#	**GOAL**	**DESCRIPTION**	**EVALUATION CRITERIA**
1	**SAFETY**	Improve the safety of all users of the system for all modes of travel	(1) Project is expected to reduce crash rate and/or severity
2	**MOBILITY AND ACCESSIBILITY**	Promote efficient travel that provides access to goods, services, and employment to meet the daily needs of all users, as well as to local and regional major activity centers	(1) Project reduces vehicle delay (2) Project increases system connectivity (3) Project includes travel demand management or transportation system management and operations to better manage system capacity
3	**ACTIVE TRANSPORTATION**	Complete safe, convenient, and comfortable networks for facilities that make walking and biking an attractive choice by people of all ages and abilities	(1) Project completes existing gaps in pedestrian or bicycle network (2) Project increases access to transit for pedestrians or bicyclists (3) Project increases access to major destinations for pedestrians or bicyclists
4	**GROW THE ECONOMY**	Develop a transportation system that facilitates economic activity and draws business to the area	(1) Project increases access to employment (2) Project supports the efficient movement of freight
5	**ENVIRONMENT**	Minimize environmental impacts on natural resources and encourage lower-polluting transportation alternatives	(1) Project minimizes impact on natural resources
6	**SUPPORT HEALTHY LIVING**	Support options for exercise and healthy lifestyles to enhance the quality of life	(1) Project supports access to community amenities for bicyclists and pedestrians
7	**PREPARE FOR CHANGE**	Ensure that the choices being made today make sense at a time when Newport is growing and the transportation industry is rapidly changing	(1) Project supports access to a future growth area for Newport
8	**FISCAL RESPONSIBILITY**	Sustain an economically viable transportation system	(1) Project benefits are expected to exceed project cost

TABLE 1: RECOMMENDED EVALUATION CRITERIA			
#	GOAL	DESCRIPTION	EVALUATION CRITERIA
9	WORK WITH REGIONAL PARTNERS	Partner with other jurisdictions to plan and fund projects that better connect Newport with the region	No evaluation criteria identified

TRANSPORTATION SOLUTIONS

Newport's recommended transportation solutions, detailed below, include two types of transportation improvement strategies, resulting in four major sets of solutions for Newport:

- **Minor Roadway Improvements** which include spot motor vehicle improvements, minor roadway extensions, enhancements to the pedestrian and bicycle network, and other programmatic improvements
- **Major Roadway Improvements** which include the previously identified minor roadway improvements and one of the following major street improvement projects:
  - **US 101 Couplets**
  - **US 20 Couplet**
  - **Harney Street Extension**

Major Roadway Improvements include large-scale capital investments that could significantly alter Newport's transportation network and travel patterns. Conversely, Minor Roadway Improvements include low or medium cost capital improvements that will not significantly alter circulation patterns for vehicles in Newport. These improvements encompass the remaining transportation solutions identified for Newport and are needed even with a Major Roadway Improvement project.

The following sections summarize the evaluation of improvement options to provide early direction in developing recommended solutions for these street segments. The options consider the available right-of way and environmental constraints to ease implementation. These design options are preliminary and are subject to change. Community input and further technical analysis will ultimately lead to a recommended solution to be included in the TSP.

MINOR ROADWAY IMPROVEMENT ALTERNATIVES

The minor roadway improvement projects are solutions that do not require major capital improvements to provide benefits to Newport residents. These solutions can include pedestrian and bicycle enhancements throughout the city to support biking and walking as an alternative to driving, minor roadway capacity improvements (including at congested intersections), or minor street extensions to support local street connectivity. Bicycle and pedestrian improvements were considered at the citywide scale since these projects were developed to complete a comprehensive network for biking and walking. Other network improvements were discussed for each subarea of Newport, detailed below, since the solution strategies considered are dependent on the specific challenges facing each area.

PEDESTRIAN IMPROVEMENTS

The existing sidewalk gaps were inventoried to identify priority corridors for sidewalk infill or shared use path projects. Priority corridors were identified based on their:

- Proximity to schools
- Proximity to major destinations (*e.g.* Nye Beach, Bayfront)
- The extent of existing gaps (*i.e.* completing sidewalk infill can create a longer, more continuous pedestrian connection)
- Lack of topographical constraints

Enhanced crossing locations were also identified, as needed, to facilitate safe crossing opportunities for US 101 and US 20 based on the future sidewalk conditions for adjacent roadways.

Specific pedestrian improvements are identified for each subarea below.

BICYCLE IMPROVEMENTS

Newport's existing bicycle facilities were inventoried and used as a starting point to develop a priority bicycle network. Corridors were included in the priority bicycle network based on:

- Proximity to schools
- Proximity to major destinations (*e.g.* Nye Beach, Bayfront)
- Directness of route
- Ability to provide an off-highway connection

The functional classification and available pavement width were used to recommend bicycle treatments that were appropriate to the roadway context. Recommended treatments included:

- Separated bike facilities – treatments could include a shared use path, cycle track, separated bicycle lanes, or buffered bicycle lanes
- Bicycle lanes – treatments could include an on-street bicycle lanes without a painted buffer
- Bicycle routes – treatments could include sharrows or wayfinding with other neighborhood traffic management[1] measures as appropriate

Specific bicycle improvements for each subarea are identified below.

[1] Neighborhood traffic management treatments are document in Technical Memo #10: Transportation Standards

LOCAL STREET CONNECTIVITY IMPROVEMENTS

Improvements for the local street network, including connectivity enhancements, are not typically included as part of a TSP project list. However, as redevelopment occurs, the City should explore opportunities to enhance connectivity within neighborhoods through local street extensions. Potential connections that should be pursued may include, but are not limited to:

- Extending NE Lucky Gap Street between NE 55th Street and NE 56th Street
- Extending NE 60th Street to connect to NE Lucky Gap Street/NE 57th Street
- Extending NE 53rd Street east to connect to the vacant parcel east of NE Lucky Gap Street
- Extending a new local street connection between NE 54th Street and the vacant parcel east of NE Lucky Gap Street
- Extending a second access to the Longview Hills development. Potential options include a connection between NE Windmill Drive and NE 54th Street or a connection to the new local street network/local street extensions to serve the vacant parcel east of NE Lucky Gap Street
- Extending NE 70th Drive northeast to NE 71st Street
- Extending NE Evergreen Lane to connect to NE 70th Drive

Note all local street connections must remain within Newport's Urban Growth Boundary (UGB).

RECOMMENDED TRANSPORTATION IMPROVEMENTS

The preliminary list of projects addresses the gaps and deficiencies identified through engagement with the public and in Technical Memorandum #7 (Future Transportation System Conditions and Needs). The project list was developed by following the four-tiered identification process and through the specific considerations for bicycle and pedestrian improvements, detailed above. Specific projects were identified during the TSP planning process for the major modes of travel in Newport (motor vehicle, pedestrian, bicycle and transit) and are broken into five subareas within the City, outlined below. The TSP planning process eliminates any project that may not be feasible for reasons other than financial (such as environmental or existing development limitations).

The full list includes 74 projects and is provided in the appendix. Each project was assigned a primary source of funding for planning purposes (City, State, County, or Lincoln County Transit) although such designations do not create any obligation for funding. The project design elements depicted are identified for the purpose of creating a reasonable cost estimate for planning purposes. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City and/or ODOT approval.

Agate Beach Improvements

Agate Beach is the most northerly neighborhood in Newport which extends from Yaquina Head to Newport's north UGB. This neighborhood is largely residential and is projected to be a key residential growth area. However, Agate Beach also includes lodging, retail, restaurants, and other tourist attractions. A new industrial area is also developing near NE 73rd Street. Key challenges facing this area include:

- Limited connectivity outside of US 101 to downtown Newport
- High delay and side street congestion during summer
- Limited bicycle and pedestrian facilities on NW Lighthouse Drive
- Limited internal roadway connections
- Existing gravel or underdeveloped roadways
- Coastal erosion and other geologic constraints

These key challenges were used to inform the transportation projects for the Agate Beach area, summarized below in Table 2 and Figure 1.

TABLE 2: RECOMMENDED PROJECTS (AGATE BEACH)

PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
INT1	US 101/NE 73rd Street			Complete an intersection control evaluation: either a traffic signal or roundabout are potential solutions
INT12	US 101/NE 57th Street			Realign approach to align with NW 58th Street
EXT1	NW Gladys Street	NW 55th Street	NW 60th Street	Extend NW Gladys Street to create a continuous neighborhood collector street
SW17	NW 60th Street	US 101	NW Gladys Street	Complete existing sidewalk gaps
SW20	NW Gladys Street/NW 55th Street	NW 60th Street	US 101	Complete existing sidewalk gaps

TABLE 2: RECOMMENDED PROJECTS (AGATE BEACH)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
SW24	NW 55th Street	NW Glady Street	NW Piney Street	Complete existing sidewalk gaps
SW26	NE Avery Street/NE 71st Street	US 101	NE Echo Court	Complete existing sidewalk gaps
TR2	US 101 (North)	NW Oceanview Drive	North UGB	Construct a shared use path on one side only. The proposed path will be located on the west side of US 101 south of NW Lighthouse Drive and on the east side of US 101 north of NW Lighthouse Drive. Sidewalk infill will be completed on the opposite side between NW 60th Street and NW Oceanview Drive. Shared use path project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path). Note the specified side and project extents are subject to modification
TR5	NW Lighthouse Drive	US 101	End	Construct a shared use path on one side only and other improvements as identified by the BLM/FHWA Note pedestrian/bicycle crossing improvements may be needed at the intersection of US 101/NW Lighthouse Drive
BR10	NW 60th Street/NW Gladys Street/NW 55th Street	US 101	US 101	Install signing and striping as needed to designate a bike route through Agate Beach
BR12	NE Avery Street/NE 71st Street	US 101	NE Echo Court	Install signing and striping as needed to designate a bike route
BR16	NW 55th Street	NW Glady Street	NW Piney Street	Install signing and striping as needed to designate a bike route

TABLE 2: RECOMMENDED PROJECTS (AGATE BEACH)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
CR1	NW 60th Street/US 101			Install an enhanced pedestrian crossing
CR3	NW 55th Street/US 101			Install an enhanced pedestrian crossing
CR8	NW 68th Street/US 101			Install an enhanced pedestrian crossing
CR9	Between NW 60th Street and NW 68th Street/US 101			Install an enhanced pedestrian crossing to serve existing transit stops and RV park
CR10	NW 58th/US 101			Install an enhanced pedestrian crossing
CR11	NW 48th/US 101			Install an enhanced pedestrian crossing
CR12	NW 43rd/US 101			Install an enhanced pedestrian crossing

Note the following abbreviations correspond to different project types:

INT: Project constructs capacity improvements at an intersection

EXT: Project extends a new roadway

REV: Project changes existing traffic patterns or striping on a roadway segment

SW: Project completes existing sidewalk gaps on a roadway segment

TR: Project constructs a new shared use path for pedestrians and bicyclists

BR: Project installs a neighborhood bike route

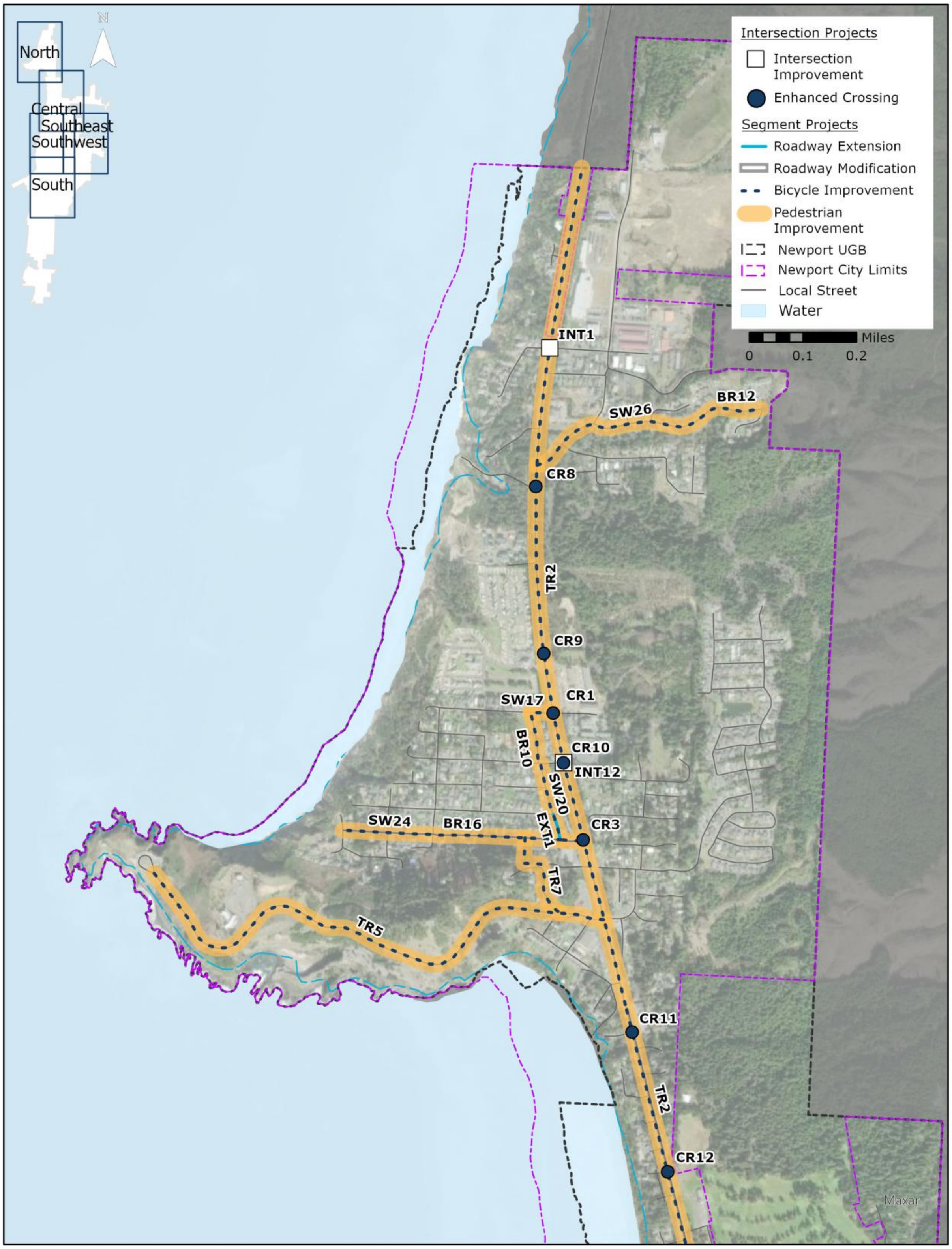
SBL: Project installs a separated bike facility

BL: Project installs on-street bike lanes

CR: Project installs an enhanced crossing for pedestrians and bicyclists

PRO: Project creates a new city program to manage the transportation system

FIGURE 1: RECOMMENDED PROJECTS (AGATE BEACH)



Oceanview/Harney Area Improvements

NW Oceanview Drive and NE Harney Street provide connections through Newport's central neighborhoods, extending from just south of Yaquina Head to the northern side of Newport's downtown. While this area is largely residential today and remains a significant residential growth area for Newport, this neighborhood also includes major retail businesses and tourist attractions. Key challenges facing this area include:

- Limited connectivity outside of US 101 to downtown Newport north of 20th Street
- High delay and side street congestion during summer
- Limited bicycle and pedestrian facilities on NW Oceanview Drive

These key challenges were used to inform the transportation projects for the Oceanview/Harney area, summarized below in Table 3 and Figure 2.

TABLE 3: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)

PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
INT3	US 101/NW Oceanview Drive			Widen the eastbound NW Oceanview Drive approach to include separate left and right turn lanes
INT8	US 101/NE 36th Street			Complete an intersection control evaluation: either a traffic signal (with separate left and right turn lanes for westbound traffic) or roundabout are potential solutions
INT11	US 101/NW 6th Street			Realign intersection

TABLE 3: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
EXT4	NE Harney Street	NE 7th Street	NE Big Creek Road	Extend NE Harney Street to a create a continuous major collector street and install a mini roundabout (i.e., roundabout with a mountable center island to accommodate school buses or large trucks) at the intersection of NE Harney Street/NE 7th Street
EXT12	NW Nye Street	NW Oceanview Drive	NW 15th Street	Extend NW Nye Street to create a continuous neighborhood collector street between NW Oceanview Drive and NW 15th Street
REV1	NE 31st Street	NE 32nd Street	NE Harney Street	Reconfigure NE 31st Street to serve pedestrians, bicycles, and emergency vehicles only Note this project is currently being refined and will only be advanced with the provision of two access points for all residents east of US 101
SW6	NE 7th Street	NE Eads Street	NE 6th Street	Complete existing sidewalk gaps
SW13	NW Nye Street	W Olive Street	NW 15th Street	Complete existing sidewalk gaps
SW14	NW/NE 11th Street	NW Spring Street	NE Eads Street	Complete existing sidewalk gaps
SW16	NW Edenview Way/NE 20th Street	NW Oceanview Drive	NE Crestview Drive	Complete existing sidewalk gaps

TABLE 3: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
SW19	NW 8th Street/NW Spring Street	NW Coast Street	NW 11th Street	Complete existing sidewalk gaps
SW21	US 101	NW 25th Street	NW Oceanview Drive	Complete sidewalk infill on east side of US 101 only Note the specified side is subject to modification
SW25	NE Harney Street/NE 36th Street	US 101	NE Big Creek Road	Complete existing sidewalk gaps
SW27	NE 12th Street	US 101	NE Benton Street	Complete existing sidewalk gaps
TR1	NW Oceanview Drive	US 101	NW Nye Street Extension	Construct a shared use path on one side only
TR2	US 101 (North)	NW Oceanview Drive	North UGB	Construct a shared use path on one side only. The proposed path will be located on the west side of US 101 south of NW Lighthouse Drive and on the east side of US 101 north of NW Lighthouse Drive. Sidewalk infill will be completed on the opposite side between NW 60th Street and NW Oceanview Drive. Shared use path project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path). Note the specified side and project extents are subject to modification

TABLE 3: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
TR6	NE Big Creek Road	NE Fogarty Street	NE Harney Street	Construct a shared use path Note this project utilizes the existing roadway width but includes separation to designate one 12 ft. travel lane and an adjacent shared use path
TR11	NW Nye Street	NW Oceanview Drive	NW 15th Street	Construct a shared use path in coordination with BL2 and SW13. Note this project should only be constructed in the event EXT12 is not constructed
TR13	US 101	NW Oceanview Drive	NW 25th Street	Construct a shared use path on the west side of US 101 Note the specified side and project extents are subject to modification
BR1	NE 12th Street	US 101	NW Eads Street	Install signing and striping as needed to designate a bike route
BR2	NE Harney Street/NE 36th Street	NE Big Creek Road	US 101	Install signing and striping as needed to designate a bike route Note this project would be eliminate in favor of on-street bike lanes if the Harney Street extension is completed
BR3	NE Eads Street/NE 12th Street	NE 3rd Street	NE Fogarty Street	Install signing and striping as needed to designate a bike route

TABLE 3: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)				
PROJECT ID	**LOCATION**	**EXTENTS**		**DESCRIPTION**
		FROM	**TO**	
BR9	NW Edenview Way/NE 20th Street	NW Oceanview Drive	NW Crestview Drive	Install signing and striping as needed to designate a bike route Restripe through US 101/NE 20th Street intersection to provide on-street bike lanes approximately between NW Edenview Way and the eastern Fred Meyer Driveway (project removes on-street parking on one side only)
BR19	NW Oceanview Drive/NW Spring Street/NW Coast Street	NW Nye Street Extension	W Olive Street	Install signing and striping as needed to designate a bike route
BL2	NW Nye Street	NW 15th Street	SW 2nd Street	Restripe NW Nye Street to include on-street bicycle lanes (project removes on-street parking on one side only)
BL8	NW/NE 11th Street	NW Spring Street	NE Eads Street	Restripe to provide on-street bike lanes (project removes on-street parking on one side only although on-street parking may be impacted on both sides of the street between NW Lake Street and NW Nye Street)
BL11	SW 10th Street/SE 2nd Street/SE Coos Street/NE Benton Street	SW 9th Street	NE 11th Street	Restripe to provide on-street bike lanes (project removes on-street parking on one side only between NE 11th Street and US 20) Note 5 ft. bike lanes are acceptable between US 20 and SE 2nd Street

TABLE 3: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
CR5	NW Oceanview/US 101			Install an enhanced pedestrian crossing
CR11	NW 48th/US 101			Install an enhanced pedestrian crossing
CR12	NW 43rd/US 101			Install an enhanced pedestrian crossing
CR13	Best Western Driveway/US 101			Install an enhanced pedestrian crossing
CR14	NE 17th/US 101			Install an enhanced pedestrian crossing
CR15	NW 12th/US 101			Install an enhanced pedestrian crossing
CR16	NW 8th/US 101			Install an enhanced pedestrian crossing

Note the following abbreviations correspond to different project types:

INT: Project constructs capacity improvements at an intersection

EXT: Project extends a new roadway

REV: Project changes existing traffic patterns or striping on a roadway segment

SW: Project completes existing sidewalk gaps on a roadway segment

TR: Project constructs a new shared use path for pedestrians and bicyclists

BR: Project installs a neighborhood bike route

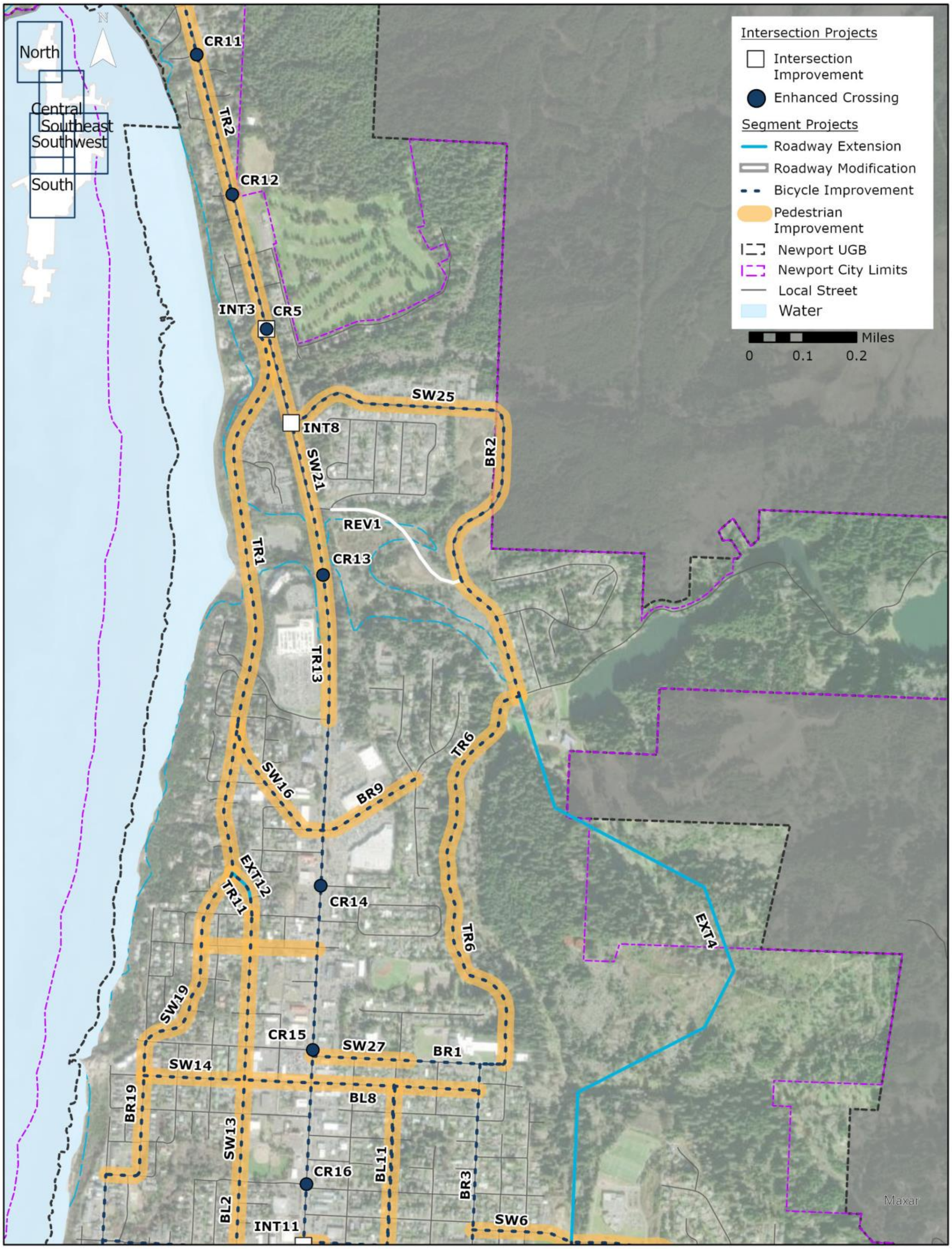
SBL: Project installs a separated bike facility

BL: Project installs on-street bike lanes

CR: Project installs an enhanced crossing for pedestrians and bicyclists

PRO: Project creates a new city program to manage the transportation system

FIGURE 2: RECOMMENDED PROJECTS (OCEANVIEW/HARNEY AREA)



Commercial Core Improvements

Newport's commercial core includes Newport's downtown area, the historic Bayfront, the southern extents of Nye Beach, the Yaquina Bay lighthouse, and adjacent land uses. This area generally features a well-connected local street network with a mix of residential, commercial, and tourist attractions. Key challenges facing this area include:

- Congestion and high side street and highway delay for both US 20 and US 101 during the summer
- Limited available right-of-way on US 101 and US 20 for future improvements
- Limited access to the hospital and businesses from US 101 and US 20 due to the congestion
- Congestion near the Newport schools
- Limited pedestrian/bicycle connectivity for alternative routes parallel to US 101
- Limited safe crossing opportunities on US 101 and US 20 for pedestrians and cyclists
- High freight volumes on Bay Boulevard with limited access to these areas from US 101 ad US 20
- Limited parking in Nye Beach and Bayfront areas
- Narrow on-street parking for US 101

These key challenges were used to inform the transportation projects for the Commercial Core area, summarized below in Table 4 and Figure 3.

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)

PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
INT4	US 101/US 20			Construct intersection improvements
INT5	US 101/SW Hurbert Street			Restripe US 101 approaches to include left turn lanes and modify signal to include protected left turn phases for US 101 (project removes on-street parking)

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
INT6	US 101/SE Moore Drive/NE Harney Street			Complete an intersection control evaluation: either a traffic signal (with separate left turn lanes on the northbound and southbound approaches) or a roundabout are potential solutions
INT7	US 101/SW Angle Street			Restripe SW Angle Street approaches to right-in/right-out only
INT10	US 20/Benton Street			Restripe northbound approach to include a right turn pocket (project removes on-street parking)
INT11	US 101/NW 6th Street			Realign intersection
EXT12	NW Nye Street	NW Oceanview Drive	NW 15th Street	Extend NW Nye Street to create a continuous neighborhood collector street between NW Oceanview Drive and NW 15th Street
REV5	Yaquina Bay Bridge Refinement Plan			Conduct a study to identify the preferred alignment of a replacement bridge, typical cross-section, implementation, and feasibility, and implement long-term recommendations from the Oregon Coast Bike Route Plan

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
SW1	NW 3rd Street	NW Brook Street	NW Nye Street	Complete existing sidewalk gaps using either standard sidewalk or restripe to provide a designated pedestrian walkway in-street
SW2	NE 3rd Street	NE Eads Street	NE Harney Street	Complete existing sidewalk gaps
SW3	SW Elizabeth Street	W Olive Street	SW Government Street	Complete existing sidewalk gaps
SW5	NE 6th Street	US 101	NE Avery Street	Complete existing sidewalk gaps (project will impact off-street parking)
SW6	NE 7th Street	NE Eads Street	NE 6th Street	Complete existing sidewalk gaps
SW8	NE Harney Street	US 20	NE 3rd Street	Complete existing sidewalk gaps
SW9	US 20	NE Fogarty Street	NE Harney Street	Complete existing sidewalk gaps
SW10	SW Abbey Street/SW Harbor Way	SW 6th Street	SW 13th Street	Complete existing sidewalk gaps. Sidewalk gaps may be completed on one side only in areas with significant topography
SW12	SW 2nd Street	SW Elizabeth Street	SW Nye Street	Complete existing sidewalk gaps
SW13	NW Nye Street	W Olive Street	NW 15th Street	Complete existing sidewalk gaps
SW14	NW/NE 11th Street	NW Spring Street	NE Eads Street	Complete existing sidewalk gaps

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
SW19	NW 8th Street/NW Spring Street	NW Coast Street	NW 11th Street	Complete existing sidewalk gaps
SW22	Yaquina Bay State Park Drive	SW Elizabeth Street	SW Naterlin Drive	Complete existing sidewalk gaps and install enhanced pedestrian crossings within the Yaquina Bay State Recreation Site Note proposed improvements should be consistent with the Yaquina Bay State Recreation Site Master Plan
SW23	SW Bay Boulevard	SE Fogarty Street	SE Moore Drive	Complete existing sidewalk gaps
SW27	NE 12th Street	US 101	NE Benton Street	Complete existing sidewalk gaps
SW28	SW Bayley Street	SW Elizabeth Street	US 101	Complete existing sidewalk gaps
TR6	NE Big Creek Road	NE Fogarty Street	NE Harney Street	Construct a shared use path Note this project utilizes the existing roadway width but includes separation to designate one 12 ft. travel lane and an adjacent shared use path
TR11	NW Nye Street	NW Oceanview Drive	NW 15th Street	Construct a shared use path in coordination with BL2 and SW13. Note this project should only be constructed in the event EXT12 is not constructed
TR12	SE 1st Street	SE Douglas Street	SE Fogarty Street	Construct a shared use path

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
BR1	NE 12th Street	US 101	NW Eads Street	Install signing and striping as needed to designate a bike route
BR3	NE Eads Street/NE 12th Street	NE 3rd Street	NE Fogarty Street	Install signing and striping as needed to designate a bike route
BR4	Yaquina Bay State Park Drive	SW Elizabeth Street	SW Naterlin Drive	Install signing and striping as needed to designate a bike route Note proposed improvements should be consistent with the Yaquina Bay State Recreation Site Master Plan
BR7	SW 2nd Street/SW Angle Street	SW Elizabeth Street	SW Nye Street	Install signing and striping as needed to designate a bike route
BR13	NW 3rd Street	US 101	NW Cliff Street	Install signing and striping as needed to designate a bike route
BR14	Yaquina Bay Bridge Interim Improvements			Install signing and striping as needed to designate a bike route and implement other improvements as identified in the Oregon Coast Bike Route Plan such as flashing warning lights or advisory speed signs
BR17	NW 6th Street	NW Coast Street	NW Nye Street	Install signing and striping as needed to designate a bike route
BR18	NE 7th Street	NE Eads Street	NE 6th Street	Install signing and striping as needed to designate a bike route

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
BR19	NW Oceanview Drive/NW Spring Street/NW Coast Street	NW Nye Street Extension	W Olive Street	Install signing and striping as needed to designate a bike route
SBL1	SE Moore Drive/NE Harney Street	SE Bay Boulevard	NE 7th Street	Restripe to install buffered bike lanes between SE Bay Boulevard and US 20; Widen to install buffered bike lanes between US 20 and NE Yaquina Heights Drive; Restripe and upgrade the existing on-street bike lanes between NE Yaquina Heights Drive and NE 7th Street (project removes on-street parking on one side only) Note: limited additional widening may be required to accommodate INT6 turn lanes
SBL2	US 101	Yaquina Bay Bridge	SW 9th Street	Construct a separated bicycle facility on US 101 Note the specified facility design and project extents are subject to review and modification
SBL3	US 101	SW 9th Street	NW 25th Street	Construct a separated bicycle facility on US 101 Note the specified facility design and project extents are subject to review and modification

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
BL1	SW Canyon Way	SW 9th Street	SW Bay Boulevard	Restripe to provide on-street bike lanes in uphill direction and mark sharrows in the downhill direction (project may convert existing angle parking near SW Bay Boulevard to parallel parking)
BL2	NW Nye Street	NW 15th Street	SW 2nd Street	Restripe NW Nye Street to include on-street bicycle lanes (project removes on-street parking on one side only)
BL4	SW 9th Street	US 101	SW Angle Street	Restripe or widen as needed to provide on-street bike lanes (project removes on-street parking) Note: this project does not assume the US 101 couplet is constructed
BL5	SW Bayley Street	US 101	SW Elizabeth Street	Restripe to provide on-street bike lanes (project removes on-street parking on one side only)
BL6	SW Hurbert Street	SW 9th Street	SW 2nd Street	Restripe to provide on-street bike lanes (existing angle parking will be converted to parallel parking on one side only)
BL7	NW/NE 6th Street	NW Nye Street	NE Eads Street	Restripe or widen as needed to provide on-street bike lanes (project removes on-street parking on one side only)

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
BL8	NW/NE 11th Street	NW Spring Street	NE Eads Street	Restripe to provide on-street bike lanes (project removes on-street parking on one side only although on-street parking may be impacted on both sides of the street between NW Lake Street and NW Nye Street)
BL9	NE 3rd Street	NE Eads Street	NE Harney Street	Widen as needed to provide on-street bike lanes
BL11	SW 10th Street/SE 2nd Street/SE Coos Street/NE Benton Street	SW 9th Street	NE 11th Street	Restripe to provide on-street bike lanes (project removes on-street parking on one side only between NE 11th Street and US 20) Note 5 ft. bike lanes are acceptable between US 20 and SE 2nd Street
BL12	SW Elizabeth Street	SW Government Street	W Olive Street	Restripe to provide on-street bike lanes (project removes on-street parking on one side only)
BL13	W Olive Street	SW Elizabeth Street	US 101	Restripe to provide on-street bike lanes (project removes on-street parking on one side only) Note project requires modification of existing curb extensions at Coast Street; on-street bike lanes may terminate prior to the US 101 intersection to provide space for turn pockets
BL14	Yaquina Bay Road	SE Moore Drive	SE Running Spring	Restripe or widen as needed to provide on-street bike lanes

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
CR2	SE Coos Street/US 20			Install an enhanced pedestrian crossing
CR4	NE Eads Street/US 20			Install an enhanced pedestrian crossing
CR7	SW Naterlin Drive/US 101			Improve pedestrian connections between Yaquina Bay Bridge and downtown Newport through pedestrian wayfinding, marked crossings, and other traffic control measures
CR14	NE 17th/US 101			Install an enhanced pedestrian crossing
CR15	NW 12th/US 101			Install an enhanced pedestrian crossing
CR16	NW 8th/US 101			Install an enhanced pedestrian crossing
CR17	SW Neff/US 101			Install an enhanced pedestrian crossing
CR18	SW Bay/US 101			Install an enhanced pedestrian crossing
CR19	SE Benton/US 20			Install an enhanced pedestrian crossing

Note the following abbreviations correspond to different project types:

INT: Project constructs capacity improvements at an intersection

EXT: Project extends a new roadway

REV: Project changes existing traffic patterns or striping on a roadway segment

SW: Project completes existing sidewalk gaps on a roadway segment

TR: Project constructs a new shared use path for pedestrians and bicyclists

BR: Project installs a neighborhood bike route

TABLE 4: RECOMMENDED PROJECTS (COMMERCIAL CORE)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	

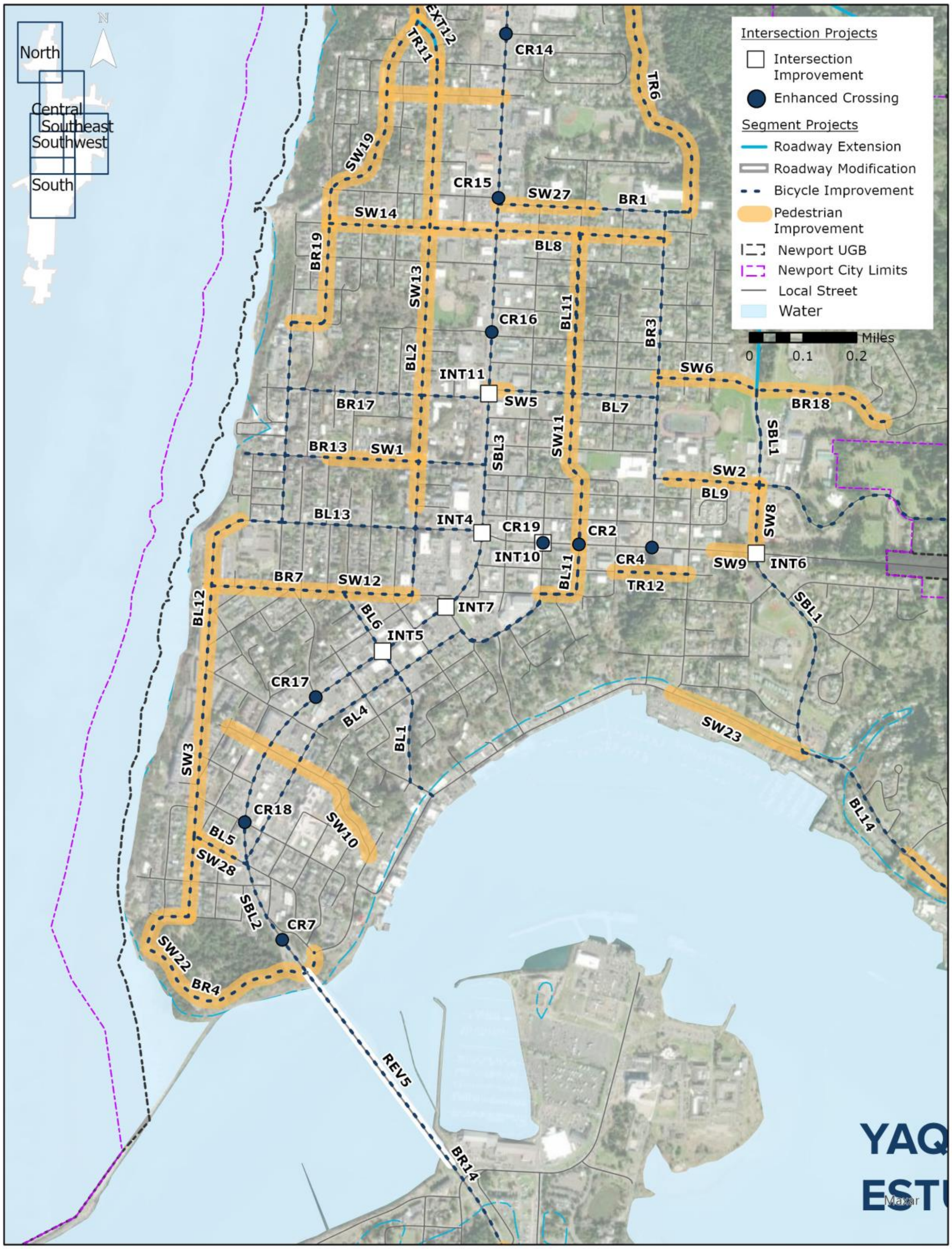
SBL: Project installs a separated bike facility

BL: Project installs on-street bike lanes

CR: Project installs an enhanced crossing for pedestrians and bicyclists

PRO: Project creates a new city program to manage the transportation system

FIGURE 3: RECOMMENDED PROJECTS (COMMERCIAL CORE)



Alternatives Evaluation for US 101/US 20 Intersection

The downtown commercial core includes the US 101/US 20 intersection which will experience high delay in the future without any improvements. High conflicting volumes on each approach limit the potential signal timing modifications which could be applied to manage congestion at this location without any roadway expansion. Several traffic management or design alternatives were considered for this location including:

- Adopting alternate mobility targets (*i.e.*, allowing a greater level of vehicle congestion at this location)
- Widening to construct a second southbound left turn lane and extending an additional eastbound receiving lane east to SE Benton Street
- Constructing a two-lane roundabout with northbound and westbound right turn bypass lanes
- Restricting Olive Street to westbound traffic only between Nye Street and US 101, rerouting eastbound Olive Street traffic to Angle Street, and upgrading the Angle Street/US 101 intersection to a signal

A comparison of these strategies is summarized below in Table 5. Each alternative was analyzed using Summer 2040 volumes, corresponding to 30th highest hour traffic volumes, except for the alternate mobility target which considered Average Weekday 2040 volumes. Adopting alternate mobility targets or travel demand management programs in coordination with each of the intersection alternatives could make each of these options feasible.

Traffic could also be managed at this intersection by adding signage to direct westbound right turning traffic to NE 1st Street as an alternative to the US 101/US 20 traffic signal in conjunction with improvements to carry the additional traffic on this street. Although diversion through the neighborhood immediately north of US 20 will likely occur by 2040 without explicit signage, adding signage can provide a designated alternate route for tourists and better manage the system capacity. Providing signage is expected to provide a modest benefit to traffic operations at US 101/US 20 although additional improvements will be needed.

TABLE 5: COMPARISON OF ALTERNATIVES FOR US 101/US 20 INTERSECTION					
ALTERNATIVE	**INTERSECTION CONFIGURATION**	**MOBILITY TARGET**	**VOLUME/ CAPACITY RATIO**	**PROS**	**CONS**
NO BUILD (BASELINE SUMMER 2040)		0.85	**0.99**	• No cost	• Does not mitigate congestion
OPTION 1: **ALTERNATE MOBILITY TARGETS (BASELINE AVERAGE WEEKDAY 2040)**		0.85	**0.91**	• No cost	• Does not mitigate congestion

TABLE 5: COMPARISON OF ALTERNATIVES FOR US 101/US 20 INTERSECTION

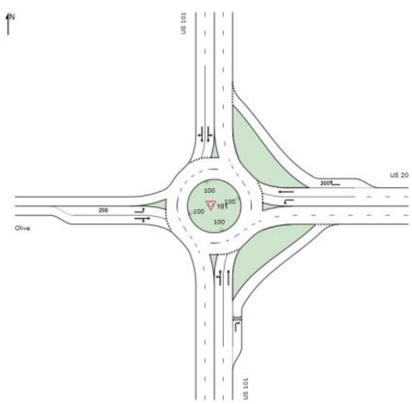
ALTERNATIVE	INTERSECTION CONFIGURATION	MOBILITY TARGET	VOLUME/ CAPACITY RATIO	PROS	CONS
OPTION 2: **ADDITIONAL SOUTHBOUND LEFT TURN LANE**		0.85	**0.90**		• Increases pedestrian crossing distance • Does not mitigate congestion • High cost • Potential for lane imbalances between for the dual left turn lanes
OPTION 3: TWO-LANE ROUNDABOUT		0.85	**0.91**	• Calms Traffic • Reduces conflict points • Reduces pedestrian crossing distance	• Does not mitigate congestion • High cost • Significant right-of-way or property impacts • Potential challenges with Heavy Truck or RV turning movements

TABLE 5: COMPARISON OF ALTERNATIVES FOR US 101/US 20 INTERSECTION					
ALTERNATIVE	**INTERSECTION CONFIGURATION**	**MOBILITY TARGET**	**VOLUME/ CAPACITY RATIO**	**PROS**	**CONS**
OPTION 4: **RESTRICT OLIVE STREET TO WESTBOUND TRAFFIC AND INSTALL A TRAFFIC SIGNAL AT ANGLE STREET**		US 101 & US 20: 0.85 ---- US 101 & Angle Street: 0.85 ---- US 101 & Hurbert Street: 0.85 ---- US 20 & Benton Street: 0.85/0.95	US 101 & US 20: **0.93*** **----** US 101 & Angle Street: 0.78 ---- US 101 & Hurbert Street: 0.54 ---- US 20 & Benton Street: 0.39/0.67	• Medium Cost • Reduces pedestrian crossing distance on one leg • Signalizes pedestrian/ bicycle crossing at Angle Street	• Eliminates eastbound movement along Olive Street. • Does not mitigate congestion

Note: **bolded** values indicate a location exceeds its mobility target

*Converting the proposed westbound through lane to a shared westbound through/left turn lane has the potential to further improve intersection operations, but this configuration cannot be analyzed using Synchro's implementation of Highway Capacity Manual 6th Edition's methodology for intersection capacity analysis.

One variation on Option 4 could be to reroute eastbound traffic on Olive Street to the north and install a new traffic signal at 3rd Street rather than Angle Street. This option would mitigate impacts to the planned expansion of Newport's City Hall and would likely operate similar to Option 4 at the US 101/US 20 intersection. However, additional analysis would be required if this option is advanced through the alternatives evaluation process.

East Newport Improvements

The East Newport neighborhood includes the existing residential and industrial areas between NE Harney Street/SE Moore Drive and Newport's eastern UGB. Key challenges facing this area include:

- Congestion at the US 20/NE Harney Street/SE Moore Drive intersection
- Existing gaps in the pedestrian/bicycle network on NE Harney Street between US 20 and NE 3rd Street
- Limited north-south connectivity between Yaquina Bay Road, US 20, and Yaquina Heights Drive
- Congestion near Newport's schools

These key challenges were used to inform the transportation projects for the East Newport area, summarized below in Table 6 and Figure 4.

TABLE 6: RECOMMENDED PROJECTS (EAST NEWPORT)

PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
INT6	US 101/SE Moore Drive/NE Harney Street			Complete an intersection control evaluation: either a traffic signal (with separate left turn lanes on the northbound and southbound approaches) or a roundabout are potential solutions
EXT3	NE 6th Street	NE 6th Street	NE Yaquina Heights Drive	Extend NE 6th Street to create a continuous neighborhood collector
EXT4	NE Harney Street	NE 7th Street	NE Big Creek Road	Extend NE Harney Street to a create a continuous major collector street and install a mini roundabout (i.e., roundabout with a mountable center island to accommodate school buses or large trucks) at the intersection of NE Harney Street/NE 7th Street
SW2	NE 3rd Street	NE Eads Street	NE Harney Street	Complete existing sidewalk gaps

TABLE 6: RECOMMENDED PROJECTS (EAST NEWPORT)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
SW6	NE 7th Street	NE Eads Street	NE 6th Street	Complete existing sidewalk gaps
SW9	US 20	NE Fogarty Street	NE Harney Street	Complete existing sidewalk gaps
SW23	SW Bay Boulevard	SE Fogarty Street	SE Moore Drive	Complete existing sidewalk gaps
SW30	Yaquina Bay Road	SE Vista Drive	SE Running Spring	Complete existing sidewalk gaps on north side only
BR18	NE 7th Street	NE Eads Street	NE 6th Street	Install signing and striping as needed to designate a bike route
SBL1	SE Moore Drive/NE Harney Street	SE Bay Boulevard	NE 7th Street	Restripe to install buffered bike lanes between SE Bay Boulevard and US 20; Widen to install buffered bike lanes between US 20 and NE Yaquina Heights Drive; Restripe and upgrade the existing on-street bike lanes between NE Yaquina Heights Drive and NE 7th Street (project removes on-street parking on one side only) Note: limited additional widening may be required to accommodate INT6 turn lanes
BL9	NE 3rd Street	NE Eads Street	NE Harney Street	Widen as needed to provide on-street bike lanes
BL10	NE Yaquina Heights Drive	NE Harney Street	US 20	Widen as needed to provide on-street bike lanes
BL14	Yaquina Bay Road	SE Moore Drive	SE Running Spring	Restripe or widen as needed to provide on-street bike lanes

TABLE 6: RECOMMENDED PROJECTS (EAST NEWPORT)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	

Note the following abbreviations correspond to different project types:

INT: Project constructs capacity improvements at an intersection

EXT: Project extends a new roadway

REV: Project changes existing traffic patterns or striping on a roadway segment

SW: Project completes existing sidewalk gaps on a roadway segment

TR: Project constructs a new shared use path for pedestrians and bicyclists

BR: Project installs a neighborhood bike route

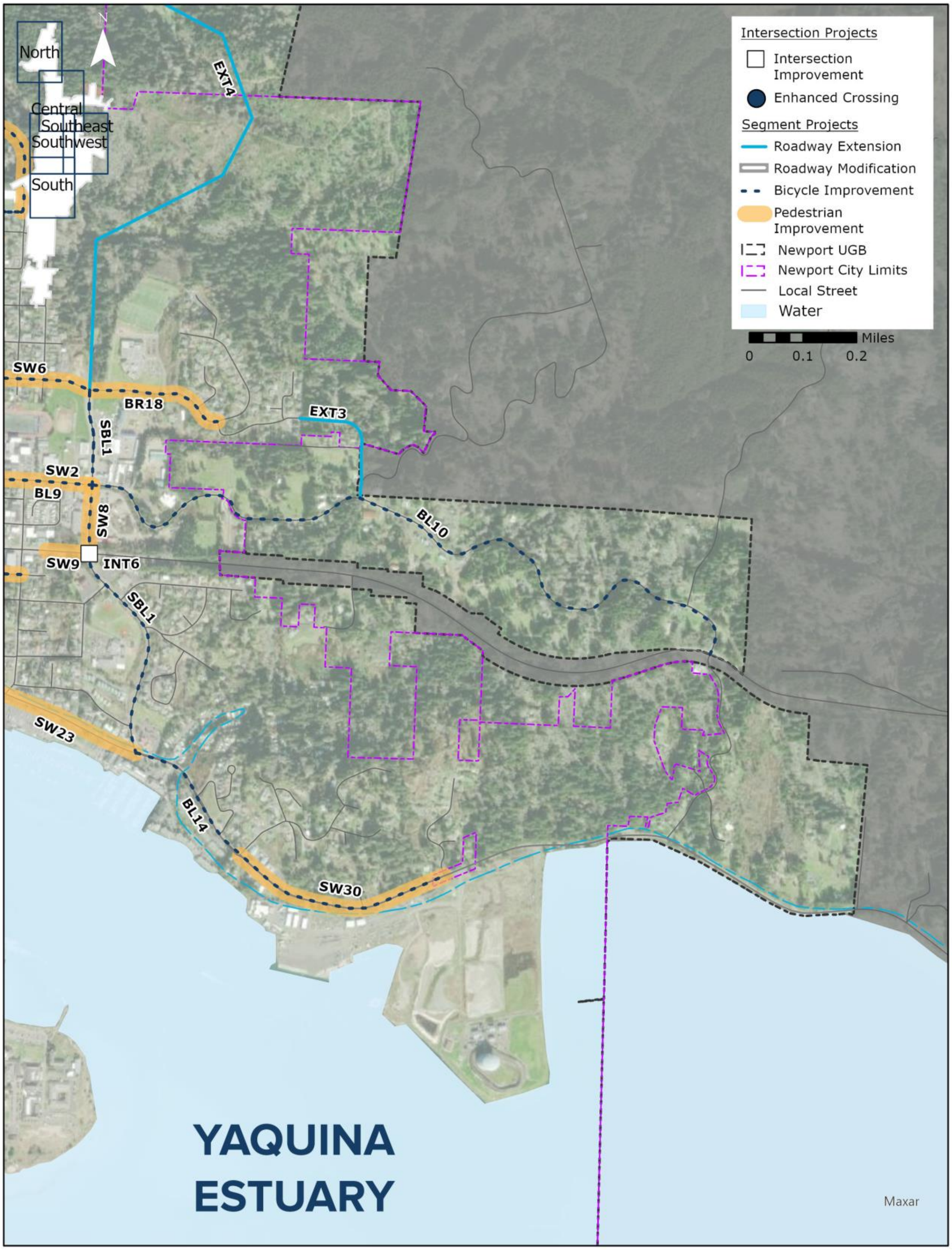
SBL: Project installs a separated bike facility

BL: Project installs on-street bike lanes

CR: Project installs an enhanced crossing for pedestrians and bicyclists

PRO: Project creates a new city program to manage the transportation system

FIGURE 4: RECOMMENDED PROJECTS (EAST NEWPORT)



South Beach Improvements

Newport's South Beach neighborhood includes all areas of Newport located south of the Yaquina Bay Bridge. Most existing development is located to the north of SE 40th Street and is a mix of residential neighborhoods, recreation, employment, and industrial areas.

The transportation projects for the South Beach area were developed based on improvements identified in Newport's 2012 TSP update which focused on the South Beach area. Projects identified from this plan and any refinements completed for this plan are summarized below in Table 7 and Figure 5.

TABLE 7: RECOMMENDED PROJECTS (SOUTH BEACH)

PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
INT9	US 101/SW 40th Street			Complete an intersection control evaluation: either a traffic signal or roundabout are potential solutions
EXT7	SW 35th Street	SW Abalone Street	SE Ferry Slip Road	Extend SW 35th Street to create a continuous major collector street and construct a shared use path on one side only
EXT8	SE Ash Street	SE 40th Street	SE 42nd Street	Extend SE Ash Street to create a continuous major collector street
EXT9	SE 50th Street	US 101	SE 50th Place	Realign SE 50th Street south to create a continuous major collector street between the existing alignment and the entrance to South Beach State Park and construct a shared use path on one side only
EXT10	SE 62nd Street	End	SE 50th Street	Extend SE 62nd Street north to create a continuous major collector street between the existing terminus and SE 50th Street and construct a shared use path on one side only

TABLE 7: RECOMMENDED PROJECTS (SOUTH BEACH)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
EXT11	SE 50th Street	SE 62nd Street	SE Harborton Street	Extend SE 50th Street to create a continuous major collector street between the SE 50th/SE 62nd intersection and SE Harborton Street and construct a shared use path on one side only
REV5	Yaquina Bay Bridge Refinement Plan			Conduct a study to identify the preferred alignment of a replacement bridge, typical cross-section, implementation, and feasibility, and implement long-term recommendations from the Oregon Coast Bike Route Plan
SW18	SE 35th Street	SE Ferry Slip Road	South Beach Manor Memory Care	Complete existing sidewalk gaps on north side only
SW22	Yaquina Bay State Park Drive	SW Elizabeth Street	SW Naterlin Drive	Complete existing sidewalk gaps and install enhanced pedestrian crossings within the Yaquina Bay State Recreation Site Note proposed improvements should be consistent with the Yaquina Bay State Recreation Site Master Plan
SW29	US 101	SE Pacific Way	SW 35th Street	Complete existing sidewalks gaps Note this project is currently being constructed

TABLE 7: RECOMMENDED PROJECTS (SOUTH BEACH)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
TR3	US 101 (South)	SE 35th Street	South UGB	Construct a shared use path on the west side of US 101 and complete existing sidewalk gaps on east side of US 101 Note the specified side and project extents are subject to modification Note sidewalk on the east side of US 101 between SE 35th Street and SE Ferry Slip Road is currently being constructed
TR9	SE 40th Street	US 101	SE Harborton Street	Construct a shared use path on one side only to complete existing gap
TR14	SW Abalone Street	US 101	SW Abalone Street	Construct a shared use path on the south side of SW Abalone Street
BR4	Yaquina Bay State Park Drive	SW Elizabeth Street	SW Naterlin Drive	Install signing and striping as needed to designate a bike route Note proposed improvements should be consistent with the Yaquina Bay State Recreation Site Master Plan
BR14	Yaquina Bay Bridge Interim Improvements			Install signing and striping as needed to designate a bike route and implement other improvements as identified in the Oregon Coast Bike Route Plan such as flashing warning lights or advisory speed signs
SBL2	US 101	Yaquina Bay Bridge	SW 9th Street	Construct a separated bicycle facility on US 101 Note the specified facility design and project extents are subject to review and modification

TABLE 7: RECOMMENDED PROJECTS (SOUTH BEACH)				
PROJECT ID	LOCATION	EXTENTS		DESCRIPTION
		FROM	TO	
SBL4	US 101	Yaquina Bay Bridge	SE 35th Street	Construct a separated bicycle facility on US 101 Note the specified facility design and project extents are subject to review and modification
CR6	SE 32nd Street/US 101			Install an enhanced pedestrian crossing
CR7	SW Naterlin Drive/US 101			Improve pedestrian connections between Yaquina Bay Bridge and downtown Newport through pedestrian wayfinding, marked crossings, and other traffic control measures

Note the following abbreviations correspond to different project types:

INT: Project constructs capacity improvements at an intersection

EXT: Project extends a new roadway

REV: Project changes existing traffic patterns or striping on a roadway segment

SW: Project completes existing sidewalk gaps on a roadway segment

TR: Project constructs a new shared use path for pedestrians and bicyclists

BR: Project installs a neighborhood bike route

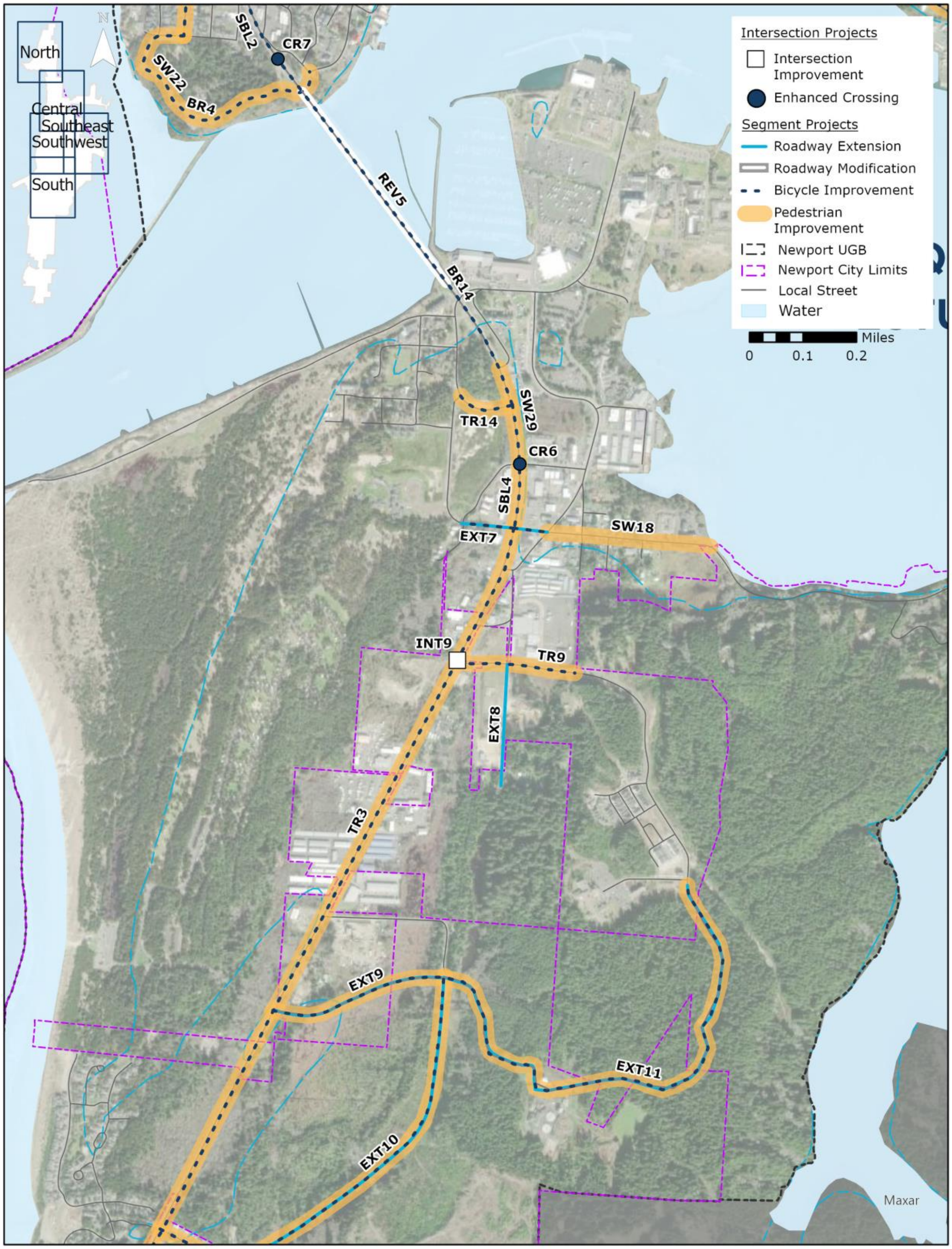
SBL: Project installs a separated bike facility

BL: Project installs on-street bike lanes

CR: Project installs an enhanced crossing for pedestrians and bicyclists

PRO: Project creates a new city program to manage the transportation system

FIGURE 5: RECOMMENDED PROJECTS (SOUTH BEACH)



Programmatic Improvements

In addition to the citywide improvements, programmatic strategies were also identified to support improved transportation system operations within Newport. These programmatic recommendations are summarized below in Table 8. Since these programmatic strategies are citywide in nature, these improvements are not shown on any particular map.

TABLE 8: RECOMMENDED PROJECTS (CITYWIDE)

PROJECT ID	LOCATION	DESCRIPTION
PRO1	Parking Management	Implement additional parking management strategies for the Nye Beach and Bayfront Areas. Strategies could include metering, permits, or other time restrictions
PRO2	Transportationd Demand Management	Implement strategies to enhance transit use in Newport. Specific strategies could include public information, stop enhancements, route refinement, or expanded service hours
PRO3	Neighborhood Traffic Management	Implement a neighborhood traffic management program Note: specific considerations for neighborhood traffic management treatments are outlined in Technical Memo #10: Transportation Standards
PRO4	Yaquina Bay Ferry Service	Implement a foot ferry for bicyclists and pedestrians across Yaquina Bay

Note the following abbreviations correspond to different project types:

INT: Project constructs capacity improvements at an intersection

EXT: Project extends a new roadway

REV: Project changes existing traffic patterns or striping on a roadway segment

SW: Project completes existing sidewalk gaps on a roadway segment

TR: Project constructs a new shared use path for pedestrians and bicyclists

BR: Project installs a neighborhood bike route

SBL: Project installs a separated bike facility

BL: Project installs on-street bike lanes

CR: Project installs an enhanced crossing for pedestrians and bicyclists

PRO: Project creates a new city program to manage the transportation system

MINOR ROADWAY IMPROVEMENT ALTERNATIVE TRANSPORTATION PERFORMANCE

The intersection improvements identified as part of the minor roadway improvement alternatives were tested in Synchro to assess their operations performance relative to the future system baseline. Operations results are summarized below in Table 9 for locations that exceed their mobility target under the baseline conditions only. Full operational results are provided in the appendix.

The minor roadway improvement alternatives resolved operational issues at most study intersections, although three intersections are still expected to exceed their mobility target in summer 2040 traffic conditions, including:

- US 101/Oceanview: this intersection is expected to be at its mobility target under summer 2040 traffic conditions. Adopting an alternate mobility target for this intersection based on average weekday traffic conditions could also be considered at this location.
- US 101/US 20: several alternatives, including an alternate mobility target, have been considered for this intersection. These solutions result in a v/c ratio between 0.91 and 0.93. While these options still exceed the mobility target, these operations are consistent with operations under existing summer traffic conditions. Implementing one of these solutions in conjunction with an alternate mobility target could be considered at this location.
- US 101/Angle: high traffic volumes on US 101 significantly delay left turn and through vehicles on Angle Street under summer 2040 traffic conditions. The proposed solution does not change left turn or through traffic operations at this intersection, but it does provide an operational benefit for right turning traffic. The existing grid system in downtown Newport provides opportunities for left turn or through traffic to access US 101 at adjacent signals, so more restrictive measures are not recommended for this location. Adopting an alternate mobility target for this intersection based on average weekday traffic conditions could also be considered at this location.

Alternate mobility targets increase the acceptable level of congestion at specific intersections rather in lieu of a capital project. As part of the 2012 South Beach TSP, alternate mobility targets were adopted for intersections on US 101 in South Beach. For a location with high seasonal traffic demands, adopting alternate mobility targets would increase the acceptable level of congestion during peak travel months. Existing traffic volume data for Newport indicates that seasonal summer traffic occurs between May and September, so adopting alternate mobility targets would permit increased vehicle traffic delay on state highway facilities for nearly half of the year.

TABLE 9: COMPARISON OF SUMMER 2040 OPERATIONAL RESULTS WITH AND WITHOUT MINOR ROADWAY IMPROVEMENTS						
#	**STUDY INTERSECTION**	**INTERS ECTION CONTR OL**	**MOBILI TY TARGET**	**BASELINE SUMMER – 2040: V/C RATIO**	**SOLUTION STRATEGY**	**MINOR ROADWAY IMPROVEMENTS SUMMER – 2040: V/C RATIO**
1	US 101/73rd	Urban 4ST	0.8/0.9 0	**0.55/1.57**	Complete an intersection control evaluation: either a traffic signal or roundabout are potential solutions Note: the minor roadway improvements alternative assumes a traffic signal is constructed	0.75
2	US 101/52nd*	Urban 4SG	0.8	**0.89**	Implement an alternate mobility target based on the average weekday condition	0.78
3	US 101/Oceanview	Urban 3ST	0.8/0.9 0	**0.72/1.12**	Widen the eastbound NW Oceanview Drive approach to include separate left and right turn lanes	**0.72/0.9**
9	US 101/US 20	Urban 4SG	0.85	**0.99**	See Table 5	**0.91 to 0.93** - See Table 5
10	US 101/Angle	Urban 4ST	0.90/0. 95	**0.49/>2.00**	Restripe SW Angle Street approaches to right-in/right-out only	0.38/0.31
11	US 101/Hurbert	Urban 4SG	0.9	**0.90**	Restripe US 101 approaches to include left turn lanes and modify signal to include protected left turn phases for US 101 (project removes on-street parking)	0.55
13	US 20/Benton	Urban 4ST	0.85/0. 95	**0.46/1.05**	Restripe northbound approach to include a right turn pocket (project removes on-street parking)	0.43/0.53

TABLE 9: COMPARISON OF SUMMER 2040 OPERATIONAL RESULTS WITH AND WITHOUT MINOR ROADWAY IMPROVEMENTS						
#	STUDY INTERSECTION	INTERSECTION CONTROL	MOBILITY TARGET	BASELINE SUMMER – 2040: V/C RATIO	SOLUTION STRATEGY	MINOR ROADWAY IMPROVEMENTS SUMMER – 2040: V/C RATIO
14	US 20/Moore	Urban 4SG	0.85	**0.85**	Complete an intersection control evaluation: either a traffic signal (with separate left turn lanes on the northbound and southbound approaches) or a roundabout are potential solutions Note: the minor roadway improvements alternative assumes turn lanes are constructed	0.63

Note: **bolded** values indicate a location exceeds its mobility target

*Reported using HCM 2000

MAJOR ROADWAY IMPROVEMENT ALTERNATIVES

Limited local street connectivity in Newport along with a heavy seasonal traffic demand is projected to create unacceptable congestion by 2040 during the PM peak period for both US 101 and US 20. The major roadway improvement alternatives were designed to mitigate congestion on these corridors by increasing roadway capacity and constructing enhanced bicycle and pedestrian facilities.

COMMERCIAL CORE ALTERNATIVES – US 101 COUPLETS

The existing alignment and design of US 101 in downtown Newport creates significant challenges for the city, including:

- Congestion due to high vehicle volumes
- Significant delay at the US 101/US 20 intersection
- Limited access to local businesses and the hospital due to high delay for side streets
- Narrow on-street parking
- No existing bike facilities
- Limited pedestrian facilities
- Limited economic development opportunities in downtown core compared to other city districts (*e.g.* Nye Beach)

A couplet on US 101 was one solution identified to address some of the existing deficiencies of US 101 through Newport. Both a short and long couplet alternative were identified as candidate treatments; the extents of these couplets and potential project impacts are identified on the following figures. The short couplet alternative extends from SW Fall Street to SW Angle Street while the long couplet alternative extends from SW Abbey Street to SW Angle Street. A review of these alternatives identified the following opportunities and constraints for the short and long couplet alternatives:

- The US 101 couplet appears to fix existing operational issues along portions of US 101 but will likely require additional intersection improvements for SW 9th Street (see below)
- Converting the US 101 alignment to one-way southbound will significantly reduce vehicle delay at the US 101/SW Hurbert Street signal by eliminating the existing split phasing
- Northbound traffic on US 101 that intends to travel east on US 20 is more likely to bypass the US 101/US 20 intersection with development of the couplet, instead turning right at NE Benton Street
- Creating new highway couplets can be an economic redevelopment tool by increasing the available commercial frontage along the highway and better utilizing the exiting street space to safely accommodate all modes of travel
- The proposed cross-sections for US 101 and SW 9th Street alignments should include significant enhancements for bicyclists and pedestrians
- Couplet termini:
    - The current geometry of the US 101/SW 9th Street intersection is well-designed to transition northbound traffic to SW 9th Street with minimal, if any, impacts to existing businesses. However, the recent hospital expansion includes parking access to SW 9th Street and SW Bay Street which would be impacted for southbound traffic if SW 9th Street is converted to one-way.
    - Beginning a couplet further north (*i.e.* at the SW Fall Street intersection) would mitigate the impacts to the hospital access, but would result in significantly higher right-of-way impacts
    - The US 101/SW Angle Street intersection is one option for the northern couplet terminus. This option would convert SW Angle Street to one-way between US 101 and SW 9th Street. Potential impacts could include:
        - Remove the existing angled on-street parking on one side or convert both sides to parallel parking
        - Shorten or remove the existing curb extensions on SW Angle Street at SW 9th Street and US 101
        - Remove off-street parking or open space areas if SW Angle Street is realigned to provide a smoother transition for US 101

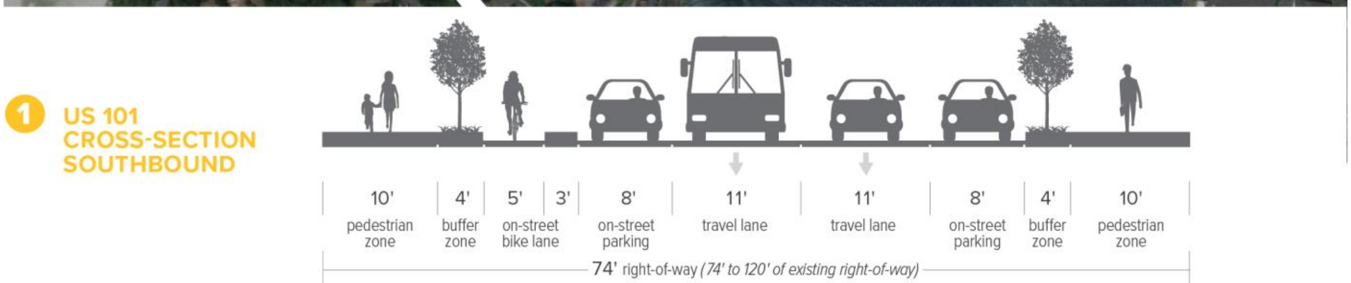
Intersection operations for all study intersections located on the US 101 couplet were evaluated to identify spot improvements that would be needed in conjunction with implementation; these results are summarized in Table 10. Due to the potential for diversion of northbound traffic to the US 20/Benton Street intersection, operational results for this intersection are also included in Table 10. All operational deficiencies resulting from construction of the US 101 couplet are tied to existing two-way stop control intersections where higher traffic volumes lead to increased side street delay. Restricting parking adjacent to these intersections and restriping the approaches to include separate turn lanes can mitigate some of these operational deficiencies although alternate mobility targets could also be considered.

TABLE 10: COMPARISON OF SUMMER 2040 OPERATIONAL RESULTS WITH AND WITHOUT US 101 COUPLET							
#	**STUDY INTERSECTION**	**INTERSECTION CONTROL**	**MOBILITY TARGET**	**BASELINE SUMMER – 2040: V/C RATIO**	**US 101 LONG COUPLET SUMMER – 2040: V/C RATIO**	**SOLUTION STRATEGY**	**US 101 LONG COUPLET WITH RECOMMENDED SOLUTIONS: V/C RATIO**
10	US 101/Angle	Urban 4ST	0.90/0.95	**0.49/ >2.00**	0.38/0.06	N/A	0.38/0.06
11	US 101/Hurbert	Urban 4SG	0.9	**0.90**	0.54	N/A	0.54
12	US 101/Bayley	Urban 4ST	0.90/0.95	0.41/0.79	**0.39/1.42***	Restripe eastbound and westbound approaches to provide right turn lanes (project removes on-street parking)	**0.39/1.11***
13	US 20/Benton	Urban 4ST	0.85/0.95	**0.46/1.05**	0.22/0.64	N/A	0.22/0.64
18	Hurbert/9th	Urban 4ST	0.95/0.95	0.06/0.44	**0.48/1.23**	Restripe eastbound approach to provide a left turn lane and restripe westbound approach to provide a right turn lane (project removes on-street parking)	**0.48/1.03**
19	Abbey/9th	Urban 4ST	0.95/0.95	0.09/0.23	**0.41/1.35***	Restripe eastbound approach to provide a left turn lane and restripe westbound approach to provide a right turn lane (project removes on-street parking)	0.41/0.94*

Note: **bolded** values indicate a location exceeds its mobility target

*Intersection operations would likely not be impacted under the short couplet alternative

FIGURE 6: DOWNTOWN CIRCULATION OPTION 1 – US 101 LONG COUPLET



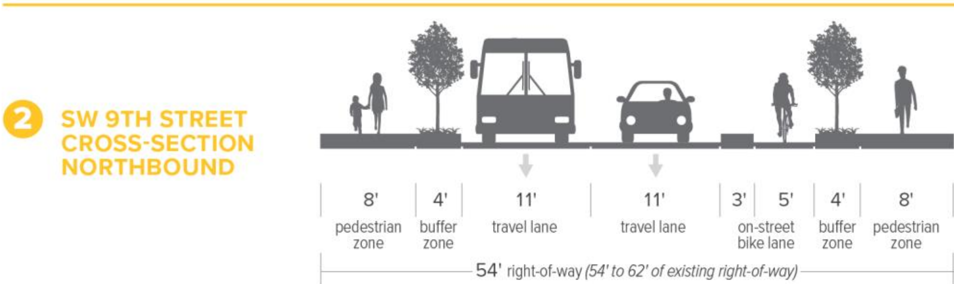


FIGURE 7: DOWNTOWN CIRCULATION OPTION 2 – US 101 SHORT COUPLET

COMMERCIAL CORE ALTERNATIVES – US 20 COUPLET

The existing alignment and design of US 20 in downtown Newport creates significant challenges for the city, including:

- Congestion due to high vehicle volumes
- Significant delay at the US 101/US 20 intersection
- Limited access to local businesses due to high delay for side streets
- Limited available right-of-way for future expansions
- No existing bike facilities
- Limited pedestrian facilities
- Limited economic development opportunities in downtown core compared to other city districts (*e.g.* Nye Beach)

A couplet on US 20 was one solution identified to address some of the existing deficiencies of US 20 through Newport. The proposed couplet will extend between Moore Drive and US 101. A review of this alternative identified the following opportunities and constraints for the US 20 couplet alternative:

- The US 20 couplet appears to fix existing operational issues along US 20 and US 101; however, the intersection of US 101/US 20 will require additional improvements
- Even with the US 20 couplet, recommended improvements at NE Harney Street and SE Moore Drive should still be made.
- Completing the US 20 couplet reduces vehicle diversion in neighborhoods to the north of US 20 since the proposed couplet will add capacity for westbound traffic
- Creating new highway couplets can be an economic redevelopment tool by increasing the available commercial frontage along the highway and better utilizing the exiting street space to safely accommodate all modes of travel
- The new cross-sections for US 20 couplet should include significant enhancements for bicyclists and pedestrians
- Couplet termini:
    - Beginning the couplet immediately west of the NE Harney Street/SE Moore Drive intersection minimizes the property impacts and new roadway construction needed.
    - Maintaining the current US 101/US 20 intersection location would require that westbound US 20 is shifted back to the current US 20 alignment prior to the intersection which would result in significant property impacts. This tie-in option would also not improve operations for the US 101/US 20 intersection

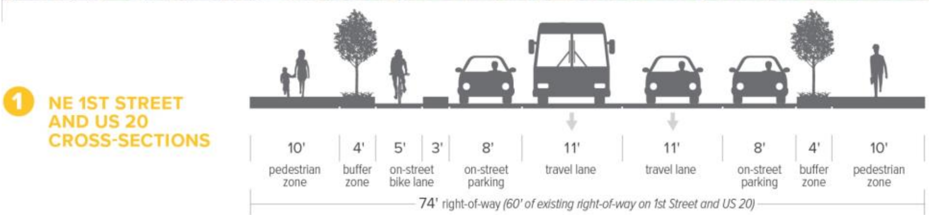
Intersection operations for all study intersections located on the US 20 couplet were evaluated to identify spot improvements that would be needed in conjunction with implementation; these results are summarized in Table 11. Operational issues related to construction of the US 20 couplet are expected at the existing traffic signals at US 101 and NE Harney Street/SE Moore Drive. Congestion near the US 101/US 20 intersection can be relieved by providing dual westbound left and right turn lanes when the westbound couplet approach is reconstructed in conjunction with signal modifications that allow for a westbound right turn overlap phase. In lieu of these dual turn lanes, previously identified solution strategies for the US 101/US 20 intersection could be applied to better manage traffic congestion with completion of the US 20 couplet. Most of the congestion at the NE Harney Street/SE Moore Drive intersection will be alleviated by completing the previously identified spot improvement at this intersection (INT6). However, restriping the westbound right turn lane to a shared through/right turn lane will also increase the capacity of this intersection.

TABLE 11: COMPARISON OF SUMMER 2040 OPERATIONAL RESULTS WITH AND WITHOUT US 20 COUPLET

#	STUDY INTERSECTION	INTERSECTION CONTROL	MOBILITY TARGET	BASELINE SUMMER – 2040: V/C RATIO	US 20 COUPLET SUMMER – 2040: V/C RATIO	SOLUTION STRATEGY	US 20 COUPLET WITH RECOMMENDED SOLUTIONS: V/C RATIO
9	US 101/US 20	Urban 4SG	0.85	**0.99**	**1.40**	Construct dual westbound right turn lanes and dual westbound left turn lanes and modify the traffic signal to include an overlap phase for westbound right turns	**0.90**
13	US 20/Benton	Urban 4ST	0.85/0.95	**0.46/1.05**	0.22/0.64	N/A	0.22/0.64
14	US 20/Harney-Moore	Urban 4SG	0.85	**0.85**	**1.22**	Widen (as necessary) and restripe to construct left turn lanes on the northbound and southbound approaches and restripe the existing westbound right turn lane to be a shared through/right-turn lane	0.64

Note: **bolded** values indicate a location exceeds its mobility target

FIGURE 8: DOWNTOWN CIRCULATION OPTION 3 – US 20 COUPLET



HARNEY STREET EXTENSION ALTERNATIVES

Newport does not have a parallel route on the east side of US 101 to connect future growth areas to the downtown core. The Harney Street Extension will construct a new minor arterial road between NE 7th Street and NE Big Creek Road before connecting to US 101 at the proposed NE 36th Street traffic signal. This extension will provide a continuous connection between US 20 and NE 36th Street with limited access to amenities along US 101 north of NE 7th Street. The Harney Street extension will also provide a critical connection to serve future growth in this area.

The proposed Harney Street Extension was evaluated for its potential impact to traffic operations on US 101 and US 20 and to identify any necessary improvements along the route. Key Findings include:

- The Harney Street Extension is expected to serve primarily regional traffic travelling between US 20 and US 101 to the north of Newport and future growth areas along this corridor. The projected ADT will be between 4,000 and 7,000 vehicles per day in 2040.
- This new extension provides limited connections for most Newport drivers since it provides an indirect connection between limited areas of the city. Constructing this extension will not significantly relieve congestion on US 101 in Newport.

Operations for study intersections along the Harney Street Extension both with and without the connection are summarized in Table 12. Constructing the Harney Street Extension does not significantly impact vehicle operations at the US 101/NE Harney Street/SE Moore Drive intersection relative to the 2040 summer baseline. The proposed spot improvements at this location (INT6) will be sufficient to resolve the anticipated congestion if the Harney Street extension is built. While the US 101/NE 36th Street intersection will not exceed its mobility target with construction of the Harney Street extension, signalization at this intersection could be desirable to facilitate access to and from this corridor. This intersection is expected to exceed its mobility target under summer 2040 conditions with construction of a traffic signal, so adopting an alternate mobility target would also be needed at this location.

TABLE 12: COMPARISON OF SUMMER 2040 OPERATIONAL RESULTS WITH AND WITHOUT US 20 COUPLET

#	STUDY INTERSECTION	INTERSECTION CONTROL	MOBILITY TARGET	BASELINE SUMMER – 2040: V/C RATIO	HARNEY STREET EXTENSION SUMMER – 2040: V/C RATIO	SOLUTION STRATEGY	HARNEY STREET EXTENSION WITH RECOMMENDED SOLUTIONS: V/C RATIO
4	US 101/36th	Urban 3ST	0.8/0.95	0.68/0.24	0.69/0.75	Install a traffic signal*	**0.87**

TABLE 12: COMPARISON OF SUMMER 2040 OPERATIONAL RESULTS WITH AND WITHOUT US 20 COUPLET							
#	STUDY INTERSECTION	INTERSECTION CONTROL	MOBILITY TARGET	BASELINE SUMMER – 2040: V/C RATIO	HARNEY STREET EXTENSION SUMMER – 2040: V/C RATIO	SOLUTION STRATEGY	HARNEY STREET EXTENSION WITH RECOMMENDED SOLUTIONS: V/C RATIO
14	US 20/Moore	Urban 4SG	0.85	**0.85**	**0.92**	Widen (as necessary) and restripe to construct left turn lanes on the northbound and southbound approaches	0.70
17	Harney/7th	Urban 4ST - AWSC	0.95	0.22	0.88	Retain the existing all-way stop control or construct a mini-roundabout	0.88

Note: **bolded** values indicate a location exceeds its mobility target

*Although the NE 36th Street approach does not exceed its mobility target with the Harney Street Extension, high side-street delay makes signalization desirable for a major parallel route to US 101

FIGURE 9: PROPOSED HARNEY STREET ALIGNMENT

COMPARISON OF IDENTIFIED TRANSPORTATION SOLUTIONS

Four major sets of solutions were identified for Newport, including:

- **Minor roadway improvements** which include spot motor vehicle improvements, minor roadway extensions, enhancements to the pedestrian and bicycle network, and other programmatic improvements
- **Major roadway improvements** which include the previously identified minor roadway improvements and one of the following major street improvement projects:
  - **US 101 Couplets**
  - **US 20 Couplet**
  - **Harney Street Extension**

A detailed evaluation for each of these solution strategies is included in the prior sections. This analysis was used to compare each solution strategy to each other and to highlight key differences between each of the alternatives. This comparison is summarized below in Table 13.

TABLE 13: SOLUTION STRATEGY COMPARISON						
EVALUATION CRITERIA	**EXPLANATION**	**MINOR ROADWAY IMPROVEMENTS**	**US 101 LONG COUPLET**	**US 101 SHORT COUPLET**	**US 20 COUPLET**	**HARNEY STREET EXTENSION**
PEDESTRIAN TRAVEL ON LOCAL STREETS	All scenarios include sidewalk infill on the local street network resulting in *better* conditions for pedestrians.	▲	▲	▲	▲	▲
PEDESTRIAN TRAVEL ON HIGHWAY	All scenarios recommend construction of shared use paths along US 101 for *better* pedestrian facilities. The couplet scenarios also include streetscape and pedestrian improvements along the highway in downtown Newport resulting in the *best* conditions for pedestrians.	▲	▲▲	▲▲	▲▲	▲
BICYCLE TRAVEL ON LOCAL STREETS	All scenarios include new bicycle facilities on the local street network resulting in *better* conditions for cyclists.	▲	▲	▲	▲	▲

TABLE 13: SOLUTION STRATEGY COMPARISON						
EVALUATION CRITERIA	**EXPLANATION**	**MINOR ROADWAY IMPROVEMENTS**	**US 101 LONG COUPLET**	**US 101 SHORT COUPLET**	**US 20 COUPLET**	**HARNEY STREET EXTENSION**
BICYCLE TRAVEL ON HIGHWAY	All scenarios recommend construction of shared use paths along US 101 for *better* bicycle facilities. The couplet scenarios also include bicycle lanes on the highway in downtown Newport resulting in the *best* conditions for bicyclists.	▲	▲▲	▲▲	▲▲	▲
VEHICLE OPERATIONS	All scenarios recommend construction of intersection enhancements and minor roadway extensions which can increase the capacity of the existing transportation system. These improvements result in *better* conditions for motor vehicles. The couplet scenarios and the Harney Street extension provide significant new capacity for motor vehicles resulting in the *best* conditions for motor vehicles.	▲▲	▲▲	▲▲	▲▲	▲▲

TABLE 13: SOLUTION STRATEGY COMPARISON						
EVALUATION CRITERIA	EXPLANATION	MINOR ROADWAY IMPROVEMENTS	US 101 LONG COUPLET	US 101 SHORT COUPLET	US 20 COUPLET	HARNEY STREET EXTENSION
HOSPITAL ACCESS	The US 101 long couplet alternative significantly increases volumes on SW 9th Street in front of the hospital. Increased traffic volumes can make it more challenging for people on foot or in vehicles to reach the hospital in the event of an emergency, resulting in *worse* access conditions. All other alternatives will not significantly change access conditions for the hospital.	–	▼	–	–	–

TABLE 13: SOLUTION STRATEGY COMPARISON						
EVALUATION CRITERIA	**EXPLANATION**	**MINOR ROADWAY IMPROVEMENTS**	**US 101 LONG COUPLET**	**US 101 SHORT COUPLET**	**US 20 COUPLET**	**HARNEY STREET EXTENSION**
ECONOMIC REDEVELOPMENT POTENTIAL	Increasing developable land fronting a highway can spur economic growth and redevelopment through increased traffic. Both the US 20 and US 101 short couplet alternatives will increase properties fronting the highway resulting in *better* conditions for economic redevelopment. The US 101 long couplet increases the total length and provides even more development opportunities which can create the *best* redevelopment conditions. Both the minor roadway improvements and Harney Street extension scenarios will not significantly increase access to developable commercial lands.	—	▲▲	▲	▲	—

TABLE 13: SOLUTION STRATEGY COMPARISON						
EVALUATION CRITERIA	**EXPLANATION**	**MINOR ROADWAY IMPROVEMENTS**	**US 101 LONG COUPLET**	**US 101 SHORT COUPLET**	**US 20 COUPLET**	**HARNEY STREET EXTENSION**
STREETSCAPE POTENTIAL	The revised roadway standards for Newport will ensure that new or improved roadways will provide *better* streetscape opportunities under all scenarios. Developing new couplets for both US 101 and US 20 provides an opportunity to also improve the existing roadway streetscape along the highway. These alternatives have the *best* streetscape potential.	▲	▲▲	▲▲	▲▲	▲

COST	The minor roadway improvements alternative does not include any large capital projects, so this alternative is comparatively *low* cost. The US 101 long couplet alternative includes a major capital project but utilizes the existing roadway network to minimize right-of-way costs relative to the other major capital projects. This alternative is comparatively *medium* cost. The US 101 short couplet, US 20 couplet, and Harney Street extension alternatives are all expected to require significant capital funds for construction due to either right-of-way costs or topographical constraints. These alternatives are comparatively *high* cost. Detailed cost estimates will be prepared during the next project phase.	$	$$	$$$	$$$	$$$

NOTES:

▲▲ = ALTERNATIVE PROVIDES *BEST* OUTCOME FOR EVALUATION CRITERIA

TABLE 13: SOLUTION STRATEGY COMPARISON						
EVALUATION CRITERIA	**EXPLANATION**	**MINOR ROADWAY IMPROVEMENTS**	**US 101 LONG COUPLET**	**US 101 SHORT COUPLET**	**US 20 COUPLET**	**HARNEY STREET EXTENSION**
▲ = ALTERNATIVE PROVIDES *BETTER* OUTCOME FOR EVALUATION CRITERIA						
▬ = ALTERNATIVE PROVIDES *NEUTRAL* OUTCOME FOR EVALUATION CRITERIA						
▼ = ALTERNATIVE PROVIDES *WORSE* OUTCOME FOR EVALUATION CRITERIA						
$ = **LOW**-**COST ALTERNATIVE**						
$$ = **MEDIUM**-**COST ALTERNATIVE**						
$$$ = **HIGH**-**COST ALTERNATIVE**						

APPENDIX

CONTENTS

SECTION 1: OPERATIONS RESULTS

2040 MINOR ROADWAY IMPROVEMENTS RESULTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	5	95	0	15	5	885	60	20	690	2
Future Volume (veh/h)	1	0	5	95	0	15	5	885	60	20	690	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1654	1750	1750	1750	1709	1231	808	1709	1750
Adj Flow Rate, veh/h	1	0	5	100	0	16	5	932	63	21	726	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	7	0	0	0	3	38	69	3	0
Cap, veh/h	88	15	133	251	0	21	452	1086	663	212	1114	3
Arrive On Green	0.10	0.00	0.10	0.10	0.00	0.10	0.02	0.64	0.64	0.04	0.65	0.62
Sat Flow, veh/h	109	149	1288	1249	0	200	1667	1709	1043	770	1704	5
Grp Volume(v), veh/h	6	0	0	116	0	0	5	932	63	21	0	728
Grp Sat Flow(s),veh/h/ln	1546	0	0	1448	0	0	1667	1709	1043	770	0	1708
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	0.1	24.0	1.3	0.5	0.0	14.1
Cycle Q Clear(g_c), s	0.2	0.0	0.0	4.3	0.0	0.0	0.1	24.0	1.3	0.5	0.0	14.1
Prop In Lane	0.17		0.83	0.86		0.14	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	236	0	0	271	0	0	452	1086	663	212	0	1117
V/C Ratio(X)	0.03	0.00	0.00	0.43	0.00	0.00	0.01	0.86	0.09	0.10	0.00	0.65
Avail Cap(c_a), veh/h	592	0	0	620	0	0	592	1646	1005	263	0	1645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.2	0.0	0.0	24.0	0.0	0.0	5.1	8.0	3.9	9.0	0.0	5.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	3.1	0.1	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.5	0.0	0.0	0.0	4.1	0.1	0.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	0.0	0.0	25.1	0.0	0.0	5.1	11.1	3.9	9.2	0.0	6.4
LnGrp LOS	C	A	A	C	A	A	A	B	A	A	A	A
Approach Vol, veh/h		6			116			1000			749	
Approach Delay, s/veh		22.3			25.1			10.6			6.5	
Approach LOS		C			C			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	39.0		9.7	5.4	40.0		9.7				
Change Period (Y+Rc), s	5.0	6.0		4.0	5.0	6.0		4.0				
Max Green Setting (Gmax), s	5.0	51.0		19.0	5.0	51.0		19.0				
Max Q Clear Time (g_c+I1), s	2.5	26.0		2.2	2.1	16.1		6.3				
Green Ext Time (p_c), s	0.0	6.9		0.0	0.0	4.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	5	75	85	0	15	45	915	130	30	720	25
Future Volume (veh/h)	30	5	75	85	0	15	45	915	130	30	720	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1750	1750	1750	1695	1682	1750	1750	1695	1750
Adj Flow Rate, veh/h	32	5	79	89	0	16	47	963	0	32	758	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	0	0	0	4	5	0	0	4	0
Cap, veh/h	60	5	325	64	0	328	65	1072		54	1067	
Arrive On Green	0.22	0.22	0.22	0.22	0.00	0.22	0.04	0.64	0.00	0.03	0.63	0.00
Sat Flow, veh/h	0	22	1458	0	0	1470	1615	1682	1483	1667	1695	1483
Grp Volume(v), veh/h	37	0	79	89	0	16	47	963	0	32	758	0
Grp Sat Flow(s),veh/h/ln	22	0	1458	0	0	1470	1615	1682	1483	1667	1695	1483
Q Serve(g_s), s	0.0	0.0	5.0	0.0	0.0	1.0	3.2	54.5	0.0	2.1	33.6	0.0
Cycle Q Clear(g_c), s	24.5	0.0	5.0	24.5	0.0	1.0	3.2	54.5	0.0	2.1	33.6	0.0
Prop In Lane	0.86		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	65	0	325	64	0	328	65	1072		54	1067	
V/C Ratio(X)	0.57	0.00	0.24	1.39	0.00	0.05	0.72	0.90		0.59	0.71	
Avail Cap(c_a), veh/h	65	0	325	64	0	328	86	1230		89	1240	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.6	0.0	35.8	55.8	0.0	34.2	53.2	17.3	0.0	53.5	13.9	0.0
Incr Delay (d2), s/veh	9.9	0.0	0.3	244.8	0.0	0.0	15.0	9.3	0.0	7.3	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.8	6.2	0.0	0.4	1.5	20.2	0.0	1.0	11.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	0.0	36.0	300.6	0.0	34.2	68.2	26.5	0.0	60.8	16.1	0.0
LnGrp LOS	E	A	D	F	A	C	E	C		E	B	
Approach Vol, veh/h		116			105			1010	A		790	A
Approach Delay, s/veh		44.5			260.0			28.4			17.9	
Approach LOS		D			F			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	74.6		29.0	7.7	75.4		29.0
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5
Max Green Setting (Gmax), s	5.5	80.0		24.5	5.5	80.0		24.5
Max Q Clear Time (g_c+I1), s	5.2	35.6		26.5	4.1	56.5		26.5
Green Ext Time (p_c), s	0.0	11.9		0.0	0.0	13.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	5	75	85	0	15	45	915	130	30	720	25
Future Volume (vph)	30	5	75	85	0	15	45	915	130	30	720	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.97	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1667	1441		1660	1445	1599	1667	1457	1662	1683	1488
Flt Permitted		0.71	1.00		0.73	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1242	1441		1280	1445	1599	1667	1457	1662	1683	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	5	79	89	0	16	47	963	137	32	758	26
RTOR Reduction (vph)	0	0	70	0	0	14	0	0	27	0	0	8
Lane Group Flow (vph)	0	37	9	0	89	2	47	963	110	32	758	18
Confl. Peds. (#/hr)	4		1	1		4						
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	4%	5%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4			6			2
Actuated Green, G (s)		9.9	9.9		9.9	9.9	4.2	61.3	61.3	2.6	59.7	59.7
Effective Green, g (s)		10.4	10.4		10.4	10.4	4.7	63.3	63.3	3.1	61.7	61.7
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.05	0.71	0.71	0.03	0.69	0.69
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.5	4.8	4.8	2.5	4.8	4.8
Lane Grp Cap (vph)		145	168		149	169	84	1188	1038	58	1169	1033
v/s Ratio Prot							c0.03	c0.58		0.02	0.45	
v/s Ratio Perm		0.03	0.01		c0.07	0.00			0.08			0.01
v/c Ratio		0.26	0.06		0.60	0.01	0.56	0.81	0.11	0.55	0.65	0.02
Uniform Delay, d1		35.7	34.8		37.2	34.7	41.0	8.7	4.0	42.2	7.5	4.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1		5.3	0.0	6.3	4.8	0.1	8.8	1.6	0.0
Delay (s)		36.4	34.9		42.5	34.7	47.4	13.5	4.0	51.0	9.2	4.2
Level of Service		D	C		D	C	D	B	A	D	A	A
Approach Delay (s)		35.4			41.3			13.7			10.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	60	20	1150	970	55
Future Vol, veh/h	130	60	20	1150	970	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	300	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	11	5	4	4
Mvmt Flow	138	64	21	1223	1032	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2297	1032	1091	0	-	0
Stage 1	1032	-	-	-	-	-
Stage 2	1265	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.299	-	-	-
Pot Cap-1 Maneuver	~ 43	285	607	-	-	-
Stage 1	347	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 41	285	607	-	-	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	268	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	78.7	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	607	-	154	285	-	-
HCM Lane V/C Ratio	0.035	-	0.898	0.224	-	-
HCM Control Delay (s)	11.1	-	105.3	21.2	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	6.3	0.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	170	25	220	140	250	60	825	205	330	870	70
Future Volume (veh/h)	170	170	25	220	140	250	60	825	205	330	870	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	181	181	27	234	149	266	64	878	0	351	926	74
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	7	2	2	0	4	10	4	3	3
Cap, veh/h	217	232	35	265	337	276	88	1086		308	1445	115
Arrive On Green	0.13	0.16	0.15	0.17	0.20	0.20	0.05	0.34	0.00	0.19	0.48	0.47
Sat Flow, veh/h	1654	1467	219	1576	1723	1411	1667	3221	1367	1615	3039	243
Grp Volume(v), veh/h	181	0	208	234	149	266	64	878	0	351	495	505
Grp Sat Flow(s),veh/h/ln	1654	0	1685	1576	1723	1411	1667	1611	1367	1615	1624	1658
Q Serve(g_s), s	11.7	0.0	13.0	16.0	8.4	20.6	4.2	27.3	0.0	21.0	25.3	25.3
Cycle Q Clear(g_c), s	11.7	0.0	13.0	16.0	8.4	20.6	4.2	27.3	0.0	21.0	25.3	25.3
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	217	0	267	265	337	276	88	1086		308	772	788
V/C Ratio(X)	0.84	0.00	0.78	0.88	0.44	0.96	0.73	0.81		1.14	0.64	0.64
Avail Cap(c_a), veh/h	286	0	322	272	337	276	167	1086		308	772	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.60	0.60	0.60
Uniform Delay (d), s/veh	46.6	0.0	44.5	44.7	39.0	43.9	51.3	33.2	0.0	44.5	21.8	21.8
Incr Delay (d2), s/veh	13.7	0.0	8.9	26.2	0.9	44.4	8.2	6.5	0.0	83.8	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	6.1	8.1	3.6	10.6	1.9	11.6	0.0	15.6	10.1	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	0.0	53.4	70.9	39.9	88.3	59.5	39.7	0.0	128.3	24.2	24.3
LnGrp LOS	E	A	D	E	D	F	E	D		F	C	C
Approach Vol, veh/h		389			649			942	A		1351	
Approach Delay, s/veh		56.6			70.9			41.0			51.3	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	56.3	18.4	25.5	25.0	41.1	22.5	21.4
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	42.0	18.5	20.5	20.5	32.0	18.5	20.5
Max Q Clear Time (g_c+I1), s	6.2	27.3	13.7	22.6	23.0	29.3	18.0	15.0
Green Ext Time (p_c), s	0.0	9.3	0.2	0.0	0.0	2.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	52.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Future Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1695	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	218	207	37	271	176	298	80	957	0	356	1037	85
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	4	7	2	2	0	4	10	4	3	3
Cap, veh/h	250	246	44	298	364	299	107	1114		496	1334	109
Arrive On Green	0.15	0.17	0.17	0.19	0.21	0.21	0.02	0.11	0.00	0.05	0.15	0.14
Sat Flow, veh/h	1654	1424	255	1576	1723	1414	1667	3221	1367	3132	3032	248
Grp Volume(v), veh/h	218	0	244	271	176	298	80	957	0	356	555	567
Grp Sat Flow(s),veh/h/ln	1654	0	1678	1576	1723	1414	1667	1611	1367	1566	1624	1657
Q Serve(g_s), s	15.5	0.0	16.9	20.2	10.8	25.3	5.7	35.0	0.0	13.4	39.5	39.6
Cycle Q Clear(g_c), s	15.5	0.0	16.9	20.2	10.8	25.3	5.7	35.0	0.0	13.4	39.5	39.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	250	0	291	298	364	299	107	1114		496	714	729
V/C Ratio(X)	0.87	0.00	0.84	0.91	0.48	1.00	0.75	0.86		0.72	0.78	0.78
Avail Cap(c_a), veh/h	317	0	322	302	364	299	111	1114		496	714	729
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	49.8	0.0	48.0	47.6	41.6	47.3	57.8	50.3	0.0	54.2	45.6	45.7
Incr Delay (d2), s/veh	17.6	0.0	15.8	29.0	1.0	51.6	22.2	8.7	0.0	3.9	3.6	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	0.0	8.4	10.3	4.7	13.2	3.2	16.6	0.0	5.9	18.0	18.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	0.0	63.9	76.6	42.6	98.9	80.0	58.9	0.0	58.1	49.3	49.2
LnGrp LOS	E	A	E	E	D	F	F	E		E	D	D
Approach Vol, veh/h		462			745			1037	A		1478	
Approach Delay, s/veh		65.5			77.5			60.6			51.4	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	56.8	22.2	29.3	23.0	45.5	26.7	24.8
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	7.5	49.0	22.5	22.5	18.5	38.0	22.5	22.5
Max Q Clear Time (g_c+I1), s	7.7	41.6	17.5	27.3	15.4	37.0	22.2	18.9
Green Ext Time (p_c), s	0.0	5.7	0.2	0.0	0.8	0.8	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

MOVEMENT SUMMARY

Site: 101 [US 101/US 20 Summer 2040 Baseline 30 HV]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: US 101												
3	L2	80	0.0	0.789	27.7	LOS D	8.4	214.6	0.88	1.45	2.12	20.0
8	T1	957	4.0	0.789	26.7	LOS D	8.7	224.0	0.87	1.46	2.12	20.0
18	R2	229	10.0	0.292	7.9	LOS A	1.1	29.0	0.56	0.55	0.56	24.7
Approach		1266	4.8	0.789	23.4	LOS C	8.7	224.0	0.81	1.29	1.84	20.7
East: US 20												
1	L2	271	7.0	0.615	23.4	LOS C	3.2	84.6	0.83	1.07	1.53	21.3
6	T1	176	2.0	0.437	17.9	LOS C	1.9	47.4	0.80	0.92	1.16	23.1
16	R2	298	2.0	0.601	20.6	LOS C	3.4	85.1	0.82	1.04	1.45	21.6
Approach		745	3.8	0.615	21.0	LOS C	3.4	85.1	0.82	1.03	1.41	21.9
North: US 101												
7	L2	356	4.0	0.908	36.7	LOS E	19.7	505.9	1.00	2.10	3.08	19.2
4	T1	1037	3.0	0.908	35.2	LOS E	20.9	534.3	1.00	2.11	3.08	18.5
14	R2	85	3.0	0.908	34.4	LOS D	20.9	534.3	1.00	2.12	3.09	18.3
Approach		1479	3.2	0.908	35.5	LOS E	20.9	534.3	1.00	2.11	3.08	18.7
West: Olive												
5	L2	218	1.0	0.801	54.7	LOS F	4.7	118.3	0.95	1.42	2.25	15.9
2	T1	207	1.0	0.760	43.1	LOS E	4.3	108.9	0.93	1.35	2.07	18.4
12	R2	37	4.0	0.760	43.4	LOS E	4.3	108.9	0.93	1.35	2.07	17.1
Approach		463	1.2	0.801	48.6	LOS E	4.7	118.3	0.94	1.38	2.15	17.0
All Vehicles		3952	3.6	0.908	30.4	LOS D	20.9	534.3	0.90	1.56	2.26	19.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	0	0	0	255	165	280	75	1105	315	395	915	80
Future Volume (veh/h)	0	0	0	255	165	280	75	1105	315	395	915	80
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h				271	176	298	80	1176	0	420	973	85
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				7	2	2	0	4	10	4	3	3
Cap, veh/h				355	388	319	105	1315		431	1845	161
Arrive On Green				0.22	0.22	0.22	0.13	0.82	0.00	0.09	0.20	0.20
Sat Flow, veh/h				1576	1723	1417	1667	3221	1367	1615	3016	263
Grp Volume(v), veh/h				271	176	298	80	1176	0	420	524	534
Grp Sat Flow(s),veh/h/ln				1576	1723	1417	1667	1611	1367	1615	1624	1656
Q Serve(g_s), s				19.3	10.6	24.8	5.6	29.8	0.0	31.1	34.6	34.6
Cycle Q Clear(g_c), s				19.3	10.6	24.8	5.6	29.8	0.0	31.1	34.6	34.6
Prop In Lane				1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h				355	388	319	105	1315		431	993	1013
V/C Ratio(X)				0.76	0.45	0.93	0.76	0.89		0.98	0.53	0.53
Avail Cap(c_a), veh/h				355	388	319	181	1315		431	993	1013
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	0.68	0.68	0.00	0.43	0.43	0.43
Uniform Delay (d), s/veh				43.5	40.1	45.6	51.5	9.2	0.0	54.3	32.4	32.4
Incr Delay (d2), s/veh				9.2	0.6	33.6	5.6	6.9	0.0	23.1	0.9	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.4	4.6	20.6	2.4	4.8	0.0	16.3	15.3	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				52.7	40.8	79.2	57.1	16.1	0.0	77.4	33.3	33.3
LnGrp LOS				D	D	E	E	B		E	C	C
Approach Vol, veh/h					745			1256	A		1478	
Approach Delay, s/veh					60.5			18.7			45.8	
Approach LOS					E			B			D	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	11.6	77.4		31.0	36.0	53.0
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0
Max Green Setting (Gmax), s	12.5	67.0		26.5	31.5	48.0
Max Q Clear Time (g_c+I1), s	7.6	36.6		26.8	33.1	31.8
Green Ext Time (p_c), s	0.0	16.0		0.0	0.0	11.7

Intersection Summary	
HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	115	55	10	10	120	0	1080	15	0	1100	55
Future Volume (veh/h)	320	115	55	10	10	120	0	1080	15	0	1100	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.99	0.97		0.96	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1559	1750	1723	0	1695	1750	0	1723	1723
Adj Flow Rate, veh/h	352	126	60	11	11	132	0	1187	16	0	1209	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	14	0	2	0	4	0	0	2	2
Cap, veh/h	486	407	194	39	21	166	0	1849	25	0	1802	89
Arrive On Green	0.20	0.36	0.36	0.13	0.13	0.13	0.00	1.00	1.00	0.00	1.00	1.00
Sat Flow, veh/h	1667	1115	531	50	156	1239	0	3339	44	0	3256	157
Grp Volume(v), veh/h	352	0	186	154	0	0	0	587	616	0	624	645
Grp Sat Flow(s),veh/h/ln	1667	0	1646	1445	0	0	0	1611	1687	0	1637	1691
Q Serve(g_s), s	20.9	0.0	9.7	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.9	0.0	9.7	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.32	0.07		0.86	0.00		0.03	0.00		0.09
Lane Grp Cap(c), veh/h	486	0	601	226	0	0	0	915	959	0	930	961
V/C Ratio(X)	0.72	0.00	0.31	0.68	0.00	0.00	0.00	0.64	0.64	0.00	0.67	0.67
Avail Cap(c_a), veh/h	587	0	741	260	0	0	0	915	959	0	930	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.88	0.88	0.00	0.77	0.77
Uniform Delay (d), s/veh	32.3	0.0	27.3	50.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.3	5.8	0.0	0.0	0.0	3.0	2.9	0.0	3.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.0	3.9	4.9	0.0	0.0	0.0	0.8	0.8	0.0	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	27.6	56.1	0.0	0.0	0.0	3.0	2.9	0.0	3.0	2.9
LnGrp LOS	D	A	C	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		538			154			1203			1269	
Approach Delay, s/veh		33.0			56.1			3.0			2.9	
Approach LOS		C			E			A			A	

Timer - Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		72.2		47.8		72.2	27.7	20.1
Change Period (Y+Rc), s		5.0		4.0		5.0	4.0	4.0
Max Green Setting (Gmax), s		57.0		54.0		57.0	31.0	19.0
Max Q Clear Time (g_c+I1), s		2.0		11.7		2.0	22.9	14.3
Green Ext Time (p_c), s		12.1		1.3		13.3	0.7	0.3

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	25	35	70	40	45	30	955	10	45	1080	20
Future Volume (veh/h)	40	25	35	70	40	45	30	955	10	45	1080	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1641	1750	1750	1709	1682	1750	1750	1695	1750	1750	1723	1750
Adj Flow Rate, veh/h	41	26	36	72	41	46	31	985	10	46	1113	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	8	0	0	3	5	0	0	4	0	0	2	0
Cap, veh/h	106	68	71	125	64	59	69	2325	24	58	2315	44
Arrive On Green	0.14	0.15	0.14	0.14	0.15	0.14	0.04	0.71	0.70	0.07	1.00	1.00
Sat Flow, veh/h	445	470	492	564	442	410	1667	3266	33	1667	3283	62
Grp Volume(v), veh/h	103	0	0	159	0	0	31	486	509	46	555	579
Grp Sat Flow(s),veh/h/ln	1406	0	0	1416	0	0	1667	1611	1689	1667	1637	1708
Q Serve(g_s), s	0.0	0.0	0.0	5.1	0.0	0.0	2.2	14.9	14.9	3.3	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	13.0	0.0	0.0	2.2	14.9	14.9	3.3	0.0	0.0
Prop In Lane	0.40		0.35	0.45		0.29	1.00		0.02	1.00		0.04
Lane Grp Cap(c), veh/h	240	0	0	243	0	0	69	1147	1202	58	1154	1204
V/C Ratio(X)	0.43	0.00	0.00	0.65	0.00	0.00	0.45	0.42	0.42	0.79	0.48	0.48
Avail Cap(c_a), veh/h	405	0	0	402	0	0	69	1147	1202	139	1154	1204
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.68	0.68	0.68
Uniform Delay (d), s/veh	47.2	0.0	0.0	49.5	0.0	0.0	56.1	7.1	7.1	55.4	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	2.2	0.0	0.0	11.3	1.1	1.1	28.8	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	4.8	0.0	0.0	1.1	5.2	5.4	1.8	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.1	0.0	0.0	51.7	0.0	0.0	67.5	8.3	8.2	84.2	1.0	0.9
LnGrp LOS	D	A	A	D	A	A	E	A	A	F	A	A
Approach Vol, veh/h		103			159			1026			1180	
Approach Delay, s/veh		48.1			51.7			10.0			4.2	
Approach LOS		D			D			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	88.6		21.4	9.2	89.4		21.4				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	5.0	70.0		30.5	10.0	65.0		30.5				
Max Q Clear Time (g_c+I1), s	4.2	2.0		15.0	5.3	16.9		10.0				
Green Ext Time (p_c), s	0.0	25.0		0.6	0.1	20.2		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			11.5									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	600	105	120	625	5	20	5	305	5	10	40
Future Vol, veh/h	15	600	105	120	625	5	20	5	305	5	10	40
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	0	100	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	16	632	111	126	658	5	21	5	321	5	11	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	744	0	0	1605	1581	634	1798	1690	663
Stage 1	-	-	-	-	-	-	665	665	-	914	914	-
Stage 2	-	-	-	-	-	-	940	916	-	884	776	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	935	-	-	855	-	-	83	110	477	63	94	459
Stage 1	-	-	-	-	-	-	443	461	-	330	355	-
Stage 2	-	-	-	-	-	-	311	354	-	343	410	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	854	-	-	59	92	476	17	79	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	92	-	17	79	-
Stage 1	-	-	-	-	-	-	435	453	-	324	302	-
Stage 2	-	-	-	-	-	-	232	301	-	108	403	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	32	71.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	64	476	934	-	-	854	-	-	108
HCM Lane V/C Ratio	0.411	0.674	0.017	-	-	0.148	-	-	0.536
HCM Control Delay (s)	96	26.8	8.9	-	-	9.9	-	-	71.6
HCM Lane LOS	F	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.6	5	0.1	-	-	0.5	-	-	2.5

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	20	0	0	120	0	1080	15	0	1135	55
Future Vol, veh/h	0	0	20	0	0	120	0	1080	15	0	1135	55
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	0	0	22	0	0	132	0	1187	16	0	1247	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	693	-	-	613	1329	0	0	1214	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.94	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.32	2.2	-	-	2.24	-	-
Pot Cap-1 Maneuver	0	0	390	0	0	435	526	-	-	559	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	376	-	-	430	515	-	-	553	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.2	17	0	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	515	-	-	376	430	553	-	-
HCM Lane V/C Ratio	-	-	-	0.058	0.307	-	-	-
HCM Control Delay (s)	0	-	-	15.2	17	0	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	25	35	80	50	45	30	965	10	45	1080	20
Future Volume (veh/h)	40	25	35	80	50	45	30	965	10	45	1080	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1641	1750	1750	1709	1682	1750	1750	1695	1750	1750	1723	1750
Adj Flow Rate, veh/h	41	26	36	82	52	46	31	995	10	46	1113	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	8	0	0	3	5	0	0	4	0	0	2	0
Cap, veh/h	111	71	75	134	74	56	69	2288	23	58	2277	43
Arrive On Green	0.15	0.16	0.15	0.15	0.16	0.15	0.04	0.70	0.69	0.07	1.00	1.00
Sat Flow, veh/h	439	453	479	579	473	361	1667	3266	33	1667	3283	62
Grp Volume(v), veh/h	103	0	0	180	0	0	31	491	514	46	555	579
Grp Sat Flow(s),veh/h/ln	1371	0	0	1412	0	0	1667	1611	1689	1667	1637	1708
Q Serve(g_s), s	0.0	0.0	0.0	6.9	0.0	0.0	2.2	15.7	15.7	3.3	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	14.9	0.0	0.0	2.2	15.7	15.7	3.3	0.0	0.0
Prop In Lane	0.40		0.35	0.46		0.26	1.00		0.02	1.00		0.04
Lane Grp Cap(c), veh/h	251	0	0	259	0	0	69	1128	1183	58	1135	1185
V/C Ratio(X)	0.41	0.00	0.00	0.70	0.00	0.00	0.45	0.43	0.43	0.79	0.49	0.49
Avail Cap(c_a), veh/h	398	0	0	403	0	0	69	1128	1183	139	1135	1185
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	0.0	49.1	0.0	0.0	56.1	7.7	7.7	55.4	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.0	2.5	0.0	0.0	11.3	1.2	1.2	39.1	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	5.5	0.0	0.0	1.1	5.5	5.8	2.0	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	0.0	51.6	0.0	0.0	67.5	9.0	8.9	94.5	1.5	1.4
LnGrp LOS	D	A	A	D	A	A	E	A	A	F	A	A
Approach Vol, veh/h		103			180			1036			1180	
Approach Delay, s/veh		46.8			51.6			10.7			5.1	
Approach LOS		D			D			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	87.2		22.8	9.2	88.1		22.8				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	5.0	70.0		30.5	10.0	65.0		30.5				
Max Q Clear Time (g_c+I1), s	4.2	2.0		16.9	5.3	17.7		10.0				
Green Ext Time (p_c), s	0.0	25.0		0.7	0.1	20.3		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Future Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	0	100	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	16	732	47	126	658	5	21	5	221	5	11	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	780	0	0	1705	1681	734	1816	1726	663
Stage 1	-	-	-	-	-	-	765	765	-	914	914	-
Stage 2	-	-	-	-	-	-	940	916	-	902	812	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	935	-	-	828	-	-	71	96	418	61	90	459
Stage 1	-	-	-	-	-	-	390	415	-	330	355	-
Stage 2	-	-	-	-	-	-	311	354	-	335	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	827	-	-	50	80	417	24	75	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	50	80	-	24	75	-
Stage 1	-	-	-	-	-	-	383	408	-	324	301	-
Stage 2	-	-	-	-	-	-	231	300	-	153	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	33.7	54.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	54	417	934	-	-	827	-	-	128
HCM Lane V/C Ratio	0.487	0.53	0.017	-	-	0.153	-	-	0.452
HCM Control Delay (s)	123.4	23	8.9	-	-	10.1	-	-	54.5
HCM Lane LOS	F	C	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.9	3	0.1	-	-	0.5	-	-	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Future Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	65	908	147	82	620	212	136	87	82	190	71	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	88	1396	226	112	866	711	377	233	219	327	291	176
Arrive On Green	0.06	0.50	0.48	0.07	0.51	0.51	0.28	0.29	0.29	0.28	0.29	0.28
Sat Flow, veh/h	1537	2821	457	1628	1709	1402	1270	813	767	1221	1017	616
Grp Volume(v), veh/h	65	527	528	82	620	212	136	0	169	190	0	114
Grp Sat Flow(s),veh/h/ln	1537	1637	1641	1628	1709	1402	1270	0	1580	1221	0	1633
Q Serve(g_s), s	3.3	19.2	19.3	4.0	22.5	7.0	7.4	0.0	6.8	11.9	0.0	4.3
Cycle Q Clear(g_c), s	3.3	19.2	19.3	4.0	22.5	7.0	11.7	0.0	6.8	18.7	0.0	4.3
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.49	1.00		0.38
Lane Grp Cap(c), veh/h	88	810	812	112	866	711	377	0	452	327	0	467
V/C Ratio(X)	0.74	0.65	0.65	0.73	0.72	0.30	0.36	0.00	0.37	0.58	0.00	0.24
Avail Cap(c_a), veh/h	154	1002	1004	224	1110	911	521	0	631	466	0	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.1	15.1	15.2	36.5	15.3	11.5	26.9	0.0	22.9	30.8	0.0	22.0
Incr Delay (d2), s/veh	8.6	3.4	3.4	6.6	4.3	0.9	0.4	0.0	0.4	1.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.2	7.3	1.7	8.9	2.2	2.3	0.0	2.5	3.6	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	18.5	18.6	43.1	19.6	12.4	27.3	0.0	23.2	32.4	0.0	22.3
LnGrp LOS	D	B	B	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h		1120			914			305			304	
Approach Delay, s/veh		20.1			20.0			25.0			28.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	43.6		26.9	8.6	44.6		26.9				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	10.5	48.0		31.5	7.5	51.0		31.5				
Max Q Clear Time (g_c+I1), s	6.0	21.3		20.7	5.3	24.5		13.7				
Green Ext Time (p_c), s	0.0	17.4		1.0	0.0	13.3		1.1				
Intersection Summary												
HCM 6th Ctrl Delay			21.6									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

SECTION 2: OPERATIONS RESULTS

2040 US 101 AND US 20 COUPLETS RESULTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	300	35	295	125	605	70	1000	55	380	855	70
Future Volume (veh/h)	280	300	35	295	125	605	70	1000	55	380	855	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1695	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	298	319	37	314	133	644	74	1064	0	404	910	74
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	4	7	2	2	0	4	10	4	3	3
Cap, veh/h	289	291	34	276	330	270	99	913		350	1336	109
Arrive On Green	0.17	0.19	0.19	0.17	0.19	0.19	0.06	0.28	0.00	0.43	0.88	0.86
Sat Flow, veh/h	1654	1521	176	1576	1723	1410	1667	3221	1367	1615	3034	247
Grp Volume(v), veh/h	298	0	356	314	133	644	74	1064	0	404	487	497
Grp Sat Flow(s),veh/h/ln	1654	0	1697	1576	1723	1410	1667	1611	1367	1615	1624	1657
Q Serve(g_s), s	21.0	0.0	23.0	21.0	8.1	23.0	5.2	34.0	0.0	26.0	10.7	10.9
Cycle Q Clear(g_c), s	21.0	0.0	23.0	21.0	8.1	23.0	5.2	34.0	0.0	26.0	10.7	10.9
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	289	0	325	276	330	270	99	913		350	715	730
V/C Ratio(X)	1.03	0.00	1.09	1.14	0.40	2.38	0.74	1.17		1.15	0.68	0.68
Avail Cap(c_a), veh/h	289	0	325	276	330	270	153	913		350	715	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.45	0.45	0.45
Uniform Delay (d), s/veh	49.5	0.0	48.5	49.5	42.5	48.5	55.5	43.0	0.0	34.0	4.6	4.8
Incr Delay (d2), s/veh	60.8	0.0	77.6	96.9	0.6	633.9	7.9	86.6	0.0	84.0	2.4	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	0.0	16.8	15.6	3.5	55.7	2.4	24.5	0.0	16.5	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	110.3	0.0	126.2	146.4	43.1	682.4	63.5	129.6	0.0	118.0	7.0	7.1
LnGrp LOS	F	A	F	F	D	F	E	F		F	A	A
Approach Vol, veh/h		654			1091			1138	A		1388	
Approach Delay, s/veh		118.9			450.2			125.3			39.3	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	56.8	25.0	27.0	30.0	38.0	25.0	27.0
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	48.0	20.5	22.5	25.5	33.0	20.5	22.5
Max Q Clear Time (g_c+I1), s	7.2	12.9	23.0	25.0	28.0	36.0	23.0	25.0
Green Ext Time (p_c), s	0.0	15.8	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	179.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	20	0	0	1025	0	0	0	0	1145	45
Future Vol, veh/h	0	0	20	0	0	1025	0	0	0	0	1145	45
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	16979	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	0	0	22	0	0	1126	0	0	0	0	1258	49

Major/Minor	Minor2									Major2		
Conflicting Flow All	1305	1305	693							-	-	0
Stage 1	1305	1305	-							-	-	-
Stage 2	0	0	-							-	-	-
Critical Hdwy	6.8	6.5	6.9							-	-	-
Critical Hdwy Stg 1	5.8	5.5	-							-	-	-
Critical Hdwy Stg 2	-	-	-							-	-	-
Follow-up Hdwy	3.5	4	3.3							-	-	-
Pot Cap-1 Maneuver	154	162	390							0	-	-
Stage 1	222	232	-							0	-	-
Stage 2	-	-	-							0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	148	0	382							-	-	-
Mov Cap-2 Maneuver	148	0	-							-	-	-
Stage 1	217	0	-							-	-	-
Stage 2	-	0	-							-	-	-

Approach	EB	SB
HCM Control Delay, s	15	0
HCM LOS	C	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	382	-	-
HCM Lane V/C Ratio	0.058	-	-
HCM Control Delay (s)	15	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	30	50	70	60	0	0	0	0	45	1085	20
Future Volume (veh/h)	0	30	50	70	60	0	0	0	0	45	1085	20
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	0.98		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1750	1750	1709	1682	0				1750	1723	1750
Adj Flow Rate, veh/h	0	31	52	72	62	0				46	1119	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	3	5	0				0	2	0
Cap, veh/h	0	89	149	126	94	0				99	2521	50
Arrive On Green	0.00	0.15	0.15	0.15	0.15	0.00				0.77	0.78	0.77
Sat Flow, veh/h	0	579	972	522	610	0				127	3234	64
Grp Volume(v), veh/h	0	0	83	134	0	0				622	0	564
Grp Sat Flow(s),veh/h/ln	0	0	1552	1132	0	0				1716	0	1708
Q Serve(g_s), s	0.0	0.0	5.8	8.9	0.0	0.0				15.1	0.0	13.0
Cycle Q Clear(g_c), s	0.0	0.0	5.8	14.7	0.0	0.0				15.1	0.0	13.0
Prop In Lane	0.00		0.63	0.54		0.00				0.07		0.04
Lane Grp Cap(c), veh/h	0	0	239	215	0	0				1338	0	1332
V/C Ratio(X)	0.00	0.00	0.35	0.62	0.00	0.00				0.47	0.00	0.42
Avail Cap(c_a), veh/h	0	0	401	365	0	0				1338	0	1332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	45.5	50.4	0.0	0.0				4.6	0.0	4.4
Incr Delay (d2), s/veh	0.0	0.0	0.6	2.2	0.0	0.0				1.2	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.3	4.1	0.0	0.0				5.0	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	46.2	52.6	0.0	0.0				5.8	0.0	5.3
LnGrp LOS	A	A	D	D	A	A				A	A	A
Approach Vol, veh/h		83			134						1186	
Approach Delay, s/veh		46.2			52.6						5.6	
Approach LOS		D			D						A	
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		97.5		22.5				22.5				
Change Period (Y+Rc), s		5.0		4.5				4.5				
Max Green Setting (Gmax), s		80.0		30.5				30.5				
Max Q Clear Time (g_c+I1), s		17.1		16.7				7.8				
Green Ext Time (p_c), s		26.3		0.5				0.3				

Intersection Summary	
HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	18.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	0	110	10	0	35	50	1120	10	10	1130	35
Future Vol, veh/h	25	0	110	10	0	35	50	1120	10	10	1130	35
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	28	0	122	11	0	39	56	1244	11	11	1256	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2055	2686	661	2020	2700	646	1308	0	0	1263	0	0
Stage 1	1311	1311	-	1370	1370	-	-	-	-	-	-	-
Stage 2	744	1375	-	650	1330	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	33	22	410	35	22	419	514	-	-	557	-	-
Stage 1	171	231	-	157	216	-	-	-	-	-	-	-
Stage 2	377	215	-	429	226	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 25	18	405	21	18	412	508	-	-	553	-	-
Mov Cap-2 Maneuver	~ 25	18	-	21	18	-	-	-	-	-	-	-
Stage 1	150	212	-	139	191	-	-	-	-	-	-	-
Stage 2	301	190	-	278	207	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 306.6	106.3	0.5	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	508	-	-	106	80	553	-	-
HCM Lane V/C Ratio	0.109	-	-	1.415	0.625	0.02	-	-
HCM Control Delay (s)	13	-	-	$ 306.6	106.3	11.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	10.7	2.8	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	645	75	0	0	0	0	25	325	5	95	0
Future Vol, veh/h	15	645	75	0	0	0	0	25	325	5	95	0
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	16	679	79	0	0	0	0	26	342	5	100	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	1	0	0	-	753	381	387	792	-
Stage 1	-	-	-	-	752	-	1	1	-
Stage 2	-	-	-	-	1	-	386	791	-
Critical Hdwy	4.1	-	-	-	6.5	6.96	7.5	6.5	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	-	4	3.33	3.5	4	-
Pot Cap-1 Maneuver	1635	-	-	0	341	614	551	324	0
Stage 1	-	-	-	0	421	-	-	-	0
Stage 2	-	-	-	0	-	-	614	404	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	1633	-	-	-	335	613	226	318	-
Mov Cap-2 Maneuver	-	-	-	-	335	-	226	318	-
Stage 1	-	-	-	-	413	-	-	-	-
Stage 2	-	-	-	-	-	-	250	397	-

Approach	EB	NB	SB
HCM Control Delay, s	0.2	21.5	22.3
HCM LOS		C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	579	1633	-	-	312
HCM Lane V/C Ratio	0.636	0.01	-	-	0.337
HCM Control Delay (s)	21.5	7.2	0.1	-	22.3
HCM Lane LOS	C	A	A	-	C
HCM 95th %tile Q(veh)	4.5	0	-	-	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	875	205	75	750	15	180	50	70	155	65	40
Future Volume (veh/h)	60	875	205	75	750	15	180	50	70	155	65	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	65	951	223	82	815	16	196	54	76	168	71	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	87	1324	310	110	879	721	338	76	447	149	56	27
Arrive On Green	0.06	0.50	0.49	0.07	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1537	2632	616	1628	1709	1402	882	243	1430	298	179	86
Grp Volume(v), veh/h	65	591	583	82	815	16	250	0	76	282	0	0
Grp Sat Flow(s),veh/h/ln	1537	1637	1612	1628	1709	1402	1125	0	1430	562	0	0
Q Serve(g_s), s	4.3	28.8	29.0	5.1	45.4	0.6	0.0	0.0	4.0	11.2	0.0	0.0
Cycle Q Clear(g_c), s	4.3	28.8	29.0	5.1	45.4	0.6	20.3	0.0	4.0	31.5	0.0	0.0
Prop In Lane	1.00		0.38	1.00		1.00	0.78		1.00	0.60		0.15
Lane Grp Cap(c), veh/h	87	823	811	110	879	721	408	0	447	229	0	0
V/C Ratio(X)	0.75	0.72	0.72	0.75	0.93	0.02	0.61	0.00	0.17	1.23	0.00	0.00
Avail Cap(c_a), veh/h	90	823	811	175	901	739	408	0	447	229	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.6	19.8	20.0	46.9	23.1	12.2	31.4	0.0	25.6	44.6	0.0	0.0
Incr Delay (d2), s/veh	26.8	4.8	5.0	7.3	16.8	0.0	2.4	0.0	0.1	136.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	11.5	11.5	2.3	21.1	0.2	5.8	0.0	1.4	14.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.4	24.6	25.0	54.2	39.9	12.3	33.8	0.0	25.7	181.3	0.0	0.0
LnGrp LOS	E	C	C	D	D	B	C	A	C	F	A	A
Approach Vol, veh/h		1239			913			326			282	
Approach Delay, s/veh		27.4			40.7			31.9			181.3	
Approach LOS		C			D			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.9	55.6		36.0	9.8	56.7		36.0				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	10.5	48.0		31.5	5.5	53.0		31.5				
Max Q Clear Time (g_c+I1), s	7.1	31.0		33.5	6.3	47.4		22.3				
Green Ext Time (p_c), s	0.0	13.3		0.0	0.0	4.3		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			48.0									
HCM 6th LOS			D									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	19.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Future Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	11	63	0	0	80	68	57	1494	28	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	907	1649	-	-	1635	776	2	0	0
Stage 1	2	2	-	-	1633	-	-	-	-
Stage 2	905	1647	-	-	2	-	-	-	-
Critical Hdwy	7.5	6.54	-	-	6.5	6.9	4.22	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.02	-	-	4	3.3	2.26	-	-
Pot Cap-1 Maneuver	234	98	0	0	102	345	1590	-	-
Stage 1	-	-	0	0	161	-	-	-	-
Stage 2	302	155	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	74	-	-	~ 77	341	1587	-	-
Mov Cap-2 Maneuver	-	74	-	-	~ 77	-	-	-	-
Stage 1	-	-	-	-	121	-	-	-	-
Stage 2	63	117	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		226	1
HCM LOS	-	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	1587	-	-	-	120
HCM Lane V/C Ratio	0.036	-	-	-	1.231
HCM Control Delay (s)	7.4	0.8	-	-	226
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	9.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	27.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	40	0	0	5	190	20	1105	15	0	0	0
Future Vol, veh/h	75	40	0	0	5	190	20	1105	15	0	0	0
Conflicting Peds, #/hr	23	0	27	27	0	23	8	0	34	34	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	3	0	4	0	6	0	7
Mvmt Flow	90	48	0	0	6	229	24	1331	18	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	748	1439	-	-	1430	732	8	0	0
Stage 1	8	8	-	-	1422	-	-	-	-
Stage 2	740	1431	-	-	8	-	-	-	-
Critical Hdwy	7.5	6.5	-	-	6.5	6.96	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	-	-	4	3.33	2.2	-	-
Pot Cap-1 Maneuver	305	134	0	0	136	361	1625	-	-
Stage 1	-	-	0	0	204	-	-	-	-
Stage 2	379	202	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	96	121	-	-	123	349	1613	-	-
Mov Cap-2 Maneuver	96	121	-	-	123	-	-	-	-
Stage 1	-	-	-	-	186	-	-	-	-
Stage 2	119	184	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	282.5	38	0.3
HCM LOS	F	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	1613	-	-	103	333
HCM Lane V/C Ratio	0.015	-	-	1.345	0.706
HCM Control Delay (s)	7.3	0.2	-	282.5	38
HCM Lane LOS	A	A	-	F	E
HCM 95th %tile Q(veh)	0	-	-	9.8	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	300	35	295	125	605	70	1000	55	380	855	70
Future Volume (veh/h)	280	300	35	295	125	605	70	1000	55	380	855	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.94	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1695	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	298	319	37	314	133	644	74	1064	0	404	910	74
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	4	7	2	2	0	4	10	4	3	3
Cap, veh/h	276	342	40	357	301	1000	99	966		363	1412	115
Arrive On Green	0.17	0.22	0.22	0.12	0.17	0.17	0.06	0.30	0.00	0.45	0.93	0.91
Sat Flow, veh/h	1654	1522	176	3057	1723	2408	1667	3221	1367	1615	3034	247
Grp Volume(v), veh/h	298	0	356	314	133	644	74	1064	0	404	487	497
Grp Sat Flow(s),veh/h/ln	1654	0	1698	1528	1723	1204	1667	1611	1367	1615	1624	1657
Q Serve(g_s), s	20.0	0.0	24.7	12.1	8.3	21.0	5.2	36.0	0.0	27.0	6.2	6.4
Cycle Q Clear(g_c), s	20.0	0.0	24.7	12.1	8.3	21.0	5.2	36.0	0.0	27.0	6.2	6.4
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	276	0	382	357	301	1000	99	966		363	756	771
V/C Ratio(X)	1.08	0.00	0.93	0.88	0.44	0.64	0.74	1.10		1.11	0.64	0.64
Avail Cap(c_a), veh/h	276	0	382	357	301	1000	153	966		363	756	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.45	0.45	0.45
Uniform Delay (d), s/veh	50.0	0.0	45.6	52.2	44.3	29.5	55.5	42.0	0.0	33.0	2.4	2.5
Incr Delay (d2), s/veh	77.5	0.0	29.2	21.3	0.8	1.3	7.9	60.7	0.0	67.1	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	0.0	13.5	5.7	3.6	7.8	2.4	22.4	0.0	15.3	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	127.5	0.0	74.8	73.5	45.0	30.8	63.5	102.7	0.0	100.1	4.4	4.4
LnGrp LOS	F	A	E	E	D	C	E	F		F	A	A
Approach Vol, veh/h		654			1091			1138	A		1388	
Approach Delay, s/veh		98.8			44.8			100.1			32.2	
Approach LOS		F			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	59.8	24.0	25.0	31.0	40.0	18.0	31.0
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	10.5	51.0	19.5	20.5	26.5	35.0	13.5	26.5
Max Q Clear Time (g_c+I1), s	7.2	8.4	22.0	23.0	29.0	38.0	14.1	26.7
Green Ext Time (p_c), s	0.0	17.2	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	63.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	0	110	10	0	35	50	1120	10	10	1130	35
Future Vol, veh/h	25	0	110	10	0	35	50	1120	10	10	1130	35
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	28	0	122	11	0	39	56	1244	11	11	1256	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2055	2686	661	2020	2700	646	1308	0	0	1263	0	0
Stage 1	1311	1311	-	1370	1370	-	-	-	-	-	-	-
Stage 2	744	1375	-	650	1330	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	33	22	410	35	22	419	514	-	-	557	-	-
Stage 1	171	231	-	157	216	-	-	-	-	-	-	-
Stage 2	377	215	-	429	226	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 25	18	405	21	18	412	508	-	-	553	-	-
Mov Cap-2 Maneuver	~ 25	18	-	21	18	-	-	-	-	-	-	-
Stage 1	150	212	-	139	191	-	-	-	-	-	-	-
Stage 2	301	190	-	278	207	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	96.6	77.7	0.5	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	508	-	-	25	405	21	412	553	-	-
HCM Lane V/C Ratio	0.109	-	-	1.111	0.302	0.529	0.094	0.02	-	-
HCM Control Delay (s)	13	-	-	$ 443.5	17.7	298.6	14.6	11.6	-	-
HCM Lane LOS	B	-	-	F	C	F	B	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	3.4	1.3	1.5	0.3	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	875	205	75	750	15	180	50	70	155	65	40
Future Volume (veh/h)	60	875	205	75	750	15	180	50	70	155	65	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	65	951	223	82	815	16	196	54	76	168	71	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	88	1379	323	112	1745	34	340	167	236	323	264	160
Arrive On Green	0.06	0.52	0.51	0.07	0.54	0.54	0.25	0.26	0.26	0.25	0.26	0.25
Sat Flow, veh/h	1537	2632	616	1628	3257	64	1273	645	908	1265	1018	617
Grp Volume(v), veh/h	65	591	583	82	406	425	196	0	130	168	0	114
Grp Sat Flow(s),veh/h/ln	1537	1637	1612	1628	1624	1698	1273	0	1553	1265	0	1635
Q Serve(g_s), s	3.4	21.9	22.1	4.0	12.6	12.6	11.9	0.0	5.5	10.2	0.0	4.5
Cycle Q Clear(g_c), s	3.4	21.9	22.1	4.0	12.6	12.6	16.4	0.0	5.5	15.7	0.0	4.5
Prop In Lane	1.00		0.38	1.00		0.04	1.00		0.58	1.00		0.38
Lane Grp Cap(c), veh/h	88	858	845	112	870	909	340	0	403	323	0	424
V/C Ratio(X)	0.74	0.69	0.69	0.73	0.47	0.47	0.58	0.00	0.32	0.52	0.00	0.27
Avail Cap(c_a), veh/h	189	985	970	220	997	1042	510	0	610	492	0	642
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.8	14.4	14.6	37.2	11.7	11.7	31.0	0.0	24.4	31.1	0.0	24.1
Incr Delay (d2), s/veh	8.6	3.9	4.0	6.6	1.5	1.4	1.1	0.0	0.3	1.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	8.2	8.2	1.8	4.5	4.7	3.7	0.0	2.0	3.2	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	18.3	18.6	43.8	13.2	13.1	32.1	0.0	24.7	32.4	0.0	24.4
LnGrp LOS	D	B	B	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h		1239			913			326			282	
Approach Delay, s/veh		19.9			15.9			29.2			29.2	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	46.7		25.1	8.7	47.6		25.1				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	10.5	48.0		31.5	9.5	49.0		31.5				
Max Q Clear Time (g_c+I1), s	6.0	24.1		17.7	5.4	14.6		18.4				
Green Ext Time (p_c), s	0.0	17.6		1.0	0.0	15.5		1.0				

Intersection Summary			
HCM 6th Ctrl Delay			20.6
HCM 6th LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	10.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Future Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	11	63	0	0	80	68	57	1494	28	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	907	1649	-	-	1635	776	2	0	0
Stage 1	2	2	-	-	1633	-	-	-	-
Stage 2	905	1647	-	-	2	-	-	-	-
Critical Hdwy	7.5	6.54	-	-	6.5	6.9	4.22	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.02	-	-	4	3.3	2.26	-	-
Pot Cap-1 Maneuver	234	98	0	0	102	345	1590	-	-
Stage 1	-	-	0	0	161	-	-	-	-
Stage 2	302	155	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	74	-	-	~ 77	341	1587	-	-
Mov Cap-2 Maneuver	-	74	-	-	~ 77	-	-	-	-
Stage 1	-	-	-	-	121	-	-	-	-
Stage 2	63	117	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		119.8	1
HCM LOS	-	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2
Capacity (veh/h)	1587	-	-	-	74	77	341
HCM Lane V/C Ratio	0.036	-	-	-	0.845	1.033	0.2
HCM Control Delay (s)	7.4	0.8	-	-	159.1	206.8	18.2
HCM Lane LOS	A	A	-	-	F	F	C
HCM 95th %tile Q(veh)	0.1	-	-	-	4.2	5.6	0.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	14.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	40	0	0	5	190	20	1105	15	0	0	0
Future Vol, veh/h	75	40	0	0	5	190	20	1105	15	0	0	0
Conflicting Peds, #/hr	23	0	27	27	0	23	8	0	34	34	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	3	0	4	0	6	0	7
Mvmt Flow	90	48	0	0	6	229	24	1331	18	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	748	1439	-	-	1430	732	8	0	0
Stage 1	8	8	-	-	1422	-	-	-	-
Stage 2	740	1431	-	-	8	-	-	-	-
Critical Hdwy	7.5	6.5	-	-	6.5	6.96	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	-	-	4	3.33	2.2	-	-
Pot Cap-1 Maneuver	305	134	0	0	136	361	1625	-	-
Stage 1	-	-	0	0	204	-	-	-	-
Stage 2	379	202	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	96	121	-	-	123	349	1613	-	-
Mov Cap-2 Maneuver	96	121	-	-	123	-	-	-	-
Stage 1	-	-	-	-	186	-	-	-	-
Stage 2	119	184	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	120.2	33.1	0.3
HCM LOS	F	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2
Capacity (veh/h)	1613	-	-	96	121	123	349
HCM Lane V/C Ratio	0.015	-	-	0.941	0.398	0.049	0.656
HCM Control Delay (s)	7.3	0.2	-	156	53.2	35.8	33
HCM Lane LOS	A	A	-	F	F	E	D
HCM 95th %tile Q(veh)	0	-	-	5.5	1.7	0.2	4.4

SECTION 3: OPERATIONS RESULTS

2040 HARNEY STREET EXTENSION RESULTS

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	75	50	1100	40	10	975
Future Vol, veh/h	75	50	1100	40	10	975
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	125	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	31	4	0	0	3
Mvmt Flow	80	53	1170	43	11	1037

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2229	1170	0	0	1213	0
Stage 1	1170	-	-	-	-	-
Stage 2	1059	-	-	-	-	-
Critical Hdwy	6.4	6.51	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.579	-	-	2.2	-
Pot Cap-1 Maneuver	~ 48	205	-	-	582	-
Stage 1	298	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 47	205	-	-	582	-
Mov Cap-2 Maneuver	164	-	-	-	-	-
Stage 1	298	-	-	-	-	-
Stage 2	330	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.5	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	178	582	-
HCM Lane V/C Ratio	-	-	0.747	0.018	-
HCM Control Delay (s)	-	-	68.5	11.3	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	4.8	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	760	145	65	495	290	130	75	70	300	100	40
Future Volume (veh/h)	60	760	145	65	495	290	130	75	70	300	100	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	65	826	158	71	538	315	141	82	76	326	109	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	87	960	184	95	602	494	447	247	679	401	114	45
Arrive On Green	0.06	0.35	0.34	0.06	0.35	0.35	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1537	2741	524	1628	1709	1402	822	520	1432	721	241	95
Grp Volume(v), veh/h	65	493	491	71	538	315	223	0	76	478	0	0
Grp Sat Flow(s),veh/h/ln	1537	1637	1628	1628	1709	1402	1342	0	1432	1058	0	0
Q Serve(g_s), s	4.3	28.8	28.8	4.4	30.5	19.3	0.0	0.0	3.0	35.5	0.0	0.0
Cycle Q Clear(g_c), s	4.3	28.8	28.8	4.4	30.5	19.3	10.5	0.0	3.0	46.0	0.0	0.0
Prop In Lane	1.00		0.32	1.00		1.00	0.63		1.00	0.68		0.09
Lane Grp Cap(c), veh/h	87	573	570	95	602	494	687	0	679	556	0	0
V/C Ratio(X)	0.75	0.86	0.86	0.75	0.89	0.64	0.32	0.00	0.11	0.86	0.00	0.00
Avail Cap(c_a), veh/h	90	590	587	95	616	505	692	0	684	560	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.7	31.0	31.2	47.6	31.4	27.8	17.0	0.0	15.0	31.6	0.0	0.0
Incr Delay (d2), s/veh	26.9	14.8	14.8	26.0	17.6	5.4	0.2	0.0	0.1	12.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	13.4	13.4	2.5	15.2	7.1	3.4	0.0	1.0	13.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	45.8	46.0	73.6	49.0	33.2	17.2	0.0	15.0	44.4	0.0	0.0
LnGrp LOS	E	D	D	E	D	C	B	A	B	D	A	A
Approach Vol, veh/h		1049			924			299			478	
Approach Delay, s/veh		47.7			45.5			16.6			44.4	
Approach LOS		D			D			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	40.0		52.7	9.8	40.2		52.7
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5
Max Green Setting (Gmax), s	5.5	36.0		48.5	5.5	36.0		48.5
Max Q Clear Time (g_c+I1), s	6.4	30.8		48.0	6.3	32.5		12.5
Green Ext Time (p_c), s	0.0	4.2		0.2	0.0	2.5		1.5

Intersection Summary	
HCM 6th Ctrl Delay	43.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	25.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	40	265	30	30	5	310	155	35	5	15	5
Future Vol, veh/h	5	40	265	30	30	5	310	155	35	5	15	5
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	0	0	0	0	0	1	0	0	0	0	0
Mvmt Flow	6	45	298	34	34	6	348	174	39	6	17	6
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	13.8	10.3	36.3	9.5
HCM LOS	B	B	E	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	0%	2%	46%	20%
Vol Thru, %	33%	0%	13%	46%	60%
Vol Right, %	0%	100%	85%	8%	20%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	465	35	310	65	25
LT Vol	310	0	5	30	5
Through Vol	155	0	40	30	15
RT Vol	0	35	265	5	5
Lane Flow Rate	522	39	348	73	28
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.883	0.055	0.511	0.128	0.048
Departure Headway (Hd)	6.087	5.025	5.281	6.329	6.113
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	596	713	679	564	583
Service Time	3.817	2.754	3.336	4.399	4.177
HCM Lane V/C Ratio	0.876	0.055	0.513	0.129	0.048
HCM Control Delay	38.4	8	13.8	10.3	9.5
HCM Lane LOS	E	A	B	B	A
HCM 95th-tile Q	10.3	0.2	2.9	0.4	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	75	50	1100	40	10	975
Future Volume (veh/h)	75	50	1100	40	10	975
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1750	1327	1695	1750	1750	1709
Adj Flow Rate, veh/h	80	53	1170	43	11	1037
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	31	4	0	0	3
Cap, veh/h	98	65	1257	1099	191	1383
Arrive On Green	0.10	0.10	0.74	0.74	0.02	0.81
Sat Flow, veh/h	949	629	1695	1483	1667	1709
Grp Volume(v), veh/h	134	0	1170	43	11	1037
Grp Sat Flow(s),veh/h/ln	1589	0	1695	1483	1667	1709
Q Serve(g_s), s	7.6	0.0	52.8	0.7	0.1	27.0
Cycle Q Clear(g_c), s	7.6	0.0	52.8	0.7	0.1	27.0
Prop In Lane	0.60	0.40		1.00	1.00	
Lane Grp Cap(c), veh/h	164	0	1257	1099	191	1383
V/C Ratio(X)	0.82	0.00	0.93	0.04	0.06	0.75
Avail Cap(c_a), veh/h	347	0	1518	1327	260	1716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	0.0	9.9	3.2	19.1	4.2
Incr Delay (d2), s/veh	9.4	0.0	9.5	0.0	0.1	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	14.7	0.1	0.1	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.6	0.0	19.4	3.2	19.2	5.7
LnGrp LOS	D	A	B	A	B	A
Approach Vol, veh/h	134		1213			1048
Approach Delay, s/veh	49.6		18.8			5.8
Approach LOS	D		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	71.9				78.1		13.5
Change Period (Y+Rc), s	5.0	6.0				6.0		4.0
Max Green Setting (Gmax), s	5.0	80.0				90.0		20.0
Max Q Clear Time (g_c+I1), s	2.1	54.8				29.0		9.6
Green Ext Time (p_c), s	0.0	11.2				10.6		0.2

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	760	145	65	495	290	130	75	70	300	100	40
Future Volume (veh/h)	60	760	145	65	495	290	130	75	70	300	100	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	65	826	158	71	538	315	141	82	76	326	109	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	88	1175	225	97	738	605	456	305	283	449	443	175
Arrive On Green	0.06	0.43	0.42	0.06	0.43	0.43	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1537	2741	524	1628	1709	1402	1229	821	761	1235	1192	470
Grp Volume(v), veh/h	65	493	491	71	538	315	141	0	158	326	0	152
Grp Sat Flow(s),veh/h/ln	1537	1637	1628	1628	1709	1402	1229	0	1582	1235	0	1662
Q Serve(g_s), s	3.6	21.2	21.2	3.7	22.4	14.1	7.8	0.0	6.0	21.7	0.0	5.4
Cycle Q Clear(g_c), s	3.6	21.2	21.2	3.7	22.4	14.1	13.2	0.0	6.0	27.7	0.0	5.4
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.48	1.00		0.28
Lane Grp Cap(c), veh/h	88	702	698	97	738	605	456	0	588	449	0	617
V/C Ratio(X)	0.74	0.70	0.70	0.73	0.73	0.52	0.31	0.00	0.27	0.73	0.00	0.25
Avail Cap(c_a), veh/h	125	820	815	133	856	702	600	0	774	594	0	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.9	20.1	20.2	39.7	20.2	17.9	23.6	0.0	18.8	28.9	0.0	18.7
Incr Delay (d2), s/veh	10.4	5.1	5.1	10.0	5.5	2.7	0.3	0.0	0.2	3.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	8.6	8.6	1.7	9.5	4.8	2.3	0.0	2.2	6.6	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	25.1	25.3	49.7	25.8	20.5	23.9	0.0	19.0	31.9	0.0	18.9
LnGrp LOS	D	C	C	D	C	C	C	A	B	C	A	B
Approach Vol, veh/h		1049			924			299			478	
Approach Delay, s/veh		26.8			25.8			21.3			27.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.1	40.8		35.9	8.9	41.1		35.9
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5
Max Green Setting (Gmax), s	6.5	42.0		41.5	6.5	42.0		41.5
Max Q Clear Time (g_c+I1), s	5.7	23.2		29.7	5.6	24.4		15.2
Green Ext Time (p_c), s	0.0	12.6		1.7	0.0	10.0		1.2

Intersection Summary			
HCM 6th Ctrl Delay			26.0
HCM 6th LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

APPENDIX I- TECHNICAL MEMORANDUM #9: FINANCE PROGRAM

FINANCE PROGRAM

DATE: February 18, 2021

TO: Project Management Team

FROM: Carl Springer, Kevin Chewuk, and Rochelle Starrett | DKS

SUBJECT: Newport Transportation System Plan
Finance Program (Task 5.4; Technical Memorandum #9)

Project #17081-007

This memorandum details the transportation funding that can reasonably be expected to be available through 2040. The funding assumptions will help prioritize the investments the City can make in the transportation system and will be utilized to develop reasonable budgeting assumptions when selecting a set of transportation improvements to meet identified needs over the next 20 years.

CURRENT FUNDING SOURCES

The City uses several primary funds for transportation, including the State Highway Trust, a local gas tax and utility fees, System Development Charges (SDC), Urban Renewal Agencies, in addition to other miscellaneous funds.

- **State Highway Trust**

The State Highway Trust Fund makes distributions from the state motor vehicle fuel tax, vehicle registration and title fees, driver license fees and truck weight-mile taxes. Cities and counties receive a share of State Highway Trust Fund monies, and by statute may use the money for any road-related purpose, including walking, biking, bridge, street, signal, and safety improvements.

- **Local Gas Tax**

Newport has an adopted local gas tax that is collected by fuel distributers. The local gas tax is one cent per gallon during the winter months (November 1st - May 31st) and increases to three cents per gallon during the summer months (June 1st - October 31st).

- **Stormwater Utility Fee**

Various recurring utility fees are collected monthly by all residences and businesses within the City, including a Capital Improvement Surcharge and Storm Drain Utility Fee. Beginning in fiscal year 2020 these fees are being replaced with a single Stormwater Utility Fee.

- **System Development Charges**

Transportation and stormwater SDC's are collected from new development. SDC's are a funding source for all capacity adding projects. The funds collected can pay for constructing or improving portions of roadways impacted by applicable development and include roadway improvements, bikeways and pedestrian facilities.

- **Urban Renewal Districts**

The South Beach and North Side Urban Renewal Districts use tax increment financing to fund various improvements that encourage local economic development, including roadway and intersection improvements, bikeways and pedestrian facilities. The North Side Urban Renewal District was formed to help pay for a significant portion of the projects that will come out of the TSP update. The South Beach Urban Renewal District has been established for many years and will terminate at the end of 2027. Projects that have already been programmed for the remaining phase will be included as funded projects in the TSP.

- **Other Miscellaneous Funds**

The City also currently uses funds from the Room Tax (Newport Fund #230), Public Parking (Newport Fund #211), and Line Undergrounding (Newport Fund #252) Funds, in addition to Local Improvement Districts. The Room Tax and Public Parking Funds are used for tourist-oriented street, sidewalk or parking improvements, while the Line Undergrounding Fund is used to cover utility undergrounding expenses associated with street improvements.

Local Improvement Districts (LIDs) fund capital transportation projects that benefit a specific group of property owners. LIDs require owner/voter approval and a specific project definition and are often used for sidewalks and pedestrian amenities that provide local benefit to residents along the subject street. Property owners are assessed a proportional share of the cost at the end of the project or the City may elect to allow for installment payments with interest.

REVENUES AND EXPENDITURES

The following sections detail the revenue and expenditure forecasts.

REVENUES

Current annual revenues include $665,000 from the State Highway Trust Fund, $180,000 from the local gas tax and $620,000 from the Stormwater Utility Fee (see Table 1). The City also currently receives approximately $705,000 in other revenues annually. This includes around $150,000 from the Room Tax Fund, $10,000 from the Public Parking Fund, $100,000 from the Line

Undergrounding Fund, $100,000 from Local Improvement Districts and $345,000 from other sources. Current annual SDC revenue for street and stormwater improvements is $225,000, with estimated annual revenue expected to increase to $510,000 based on forecasted yearly population and employment growth through 2040.

Assuming, as a conservative estimate[1], the same levels of funding occur in the future, Newport can expect to receive $43.4 million in State Highway Trust Fund, local gas tax, Stormwater Utility Fee and miscellaneous fee revenue through 2040. SDC's likely will provide an additional $10.2 million in revenue through 2040 (based on forecasted yearly population and employment growth through 2040).

The City estimates that the North Side Urban Renewal District will fund $37.8 million worth of project expenditures[2]. ODOT has also indicated that around $10.8 million in discretionary state and/or federal funds may be available to invest in Newport over the next 20 years[3] for system modernization and enhancement.

EXPENDITURES

Expenditures include personnel services, roadway striping, traffic control, vegetation trimming, street sweeping, maintenance, and roadway engineering.

The City estimates that it spends approximately $1.3 million per year (or $26.1 million through 2040) to maintain and operate the streets (see Table 1). This includes an escalation rate of 4.5 percent[4] on the current expenditures to account for rising costs and ensure that needed roadway maintenance and repair work will not be deferred through 2040. Note that the expenditures of the North Side Urban Renewal District were excluded from the total revenue for projects in the district, and therefore were not included as an expenditure in Table 1.

Deferring necessary repair and preservation means spending much more to fix the same streets later, and repair costs rise exponentially as streets are left unmaintained. Every $1 spent to keep a street in good condition avoids $6 to $14 needed later to rebuild the same street once it has deteriorated significantly[5].

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[1] This assumes the population growth rate in Newport will be roughly the same as the cost inflation rate, therefore, maintaining existing revenues through 2040.

[2] The total revenue for projects is $39.9 million. The total has been reduced to account for expenditures of the district.

[3] The State has not committed any future funding for projects in Newport. This assumption is for long-range planning purposes only. This estimate is based on assuming that Newport will receive a reasonable share of the state/federal funding projected to be available over the 20-year planning horizon in Region 2 and based on ODOT sustaining their current revenue structure. It is used to illustrate the degree of financial constraints faced by ODOT as of the writing of this document. Actual funding through state and federal sources may be higher or lower than the range of this estimate. This estimate does not include projects that might be funded through the federal Highway Safety Improvement Program (HSIP).

[4] Escalation rate of 4.5 percent based on the Construction Cost Index.

[5] Smart Growth America, American Association of State Highway Officials (AASHTO)

Heavy truck traffic and wet weather comprise two of the most critical factors in pavement deterioration[6]. Heavy trucks (particularly those hauling gravel, logs, construction materials, overseas containers, agricultural products, garbage) flex the pavement and create spaces underneath. Wet weather, with cracked pavement or poor drainage, can lead to water undermining pavement.

FUNDING SUMMARY

The City is expected to have about $102 million for street improvement needs (e.g., construction of new facilities) over the next 20 years, as shown in Table 1. This includes over $37.8 million to fund improvements in the North Side Urban Renewal District and around $10.8 million from state and/or federal funding sources to cover investments along state highways over the next 20 years.

TABLE 1: NEWPORT TRANSPORTATION REVENUE AND EXPENDITURES

REVENUES	AVERAGE ANNUAL AMOUNT	ESTIMATED AMOUNT THROUGH 2040
STATE HIGHWAY TRUST FUND	$665,000	$13,300,000
LOCAL GAS TAX	$180,000	$3,600,000
STORMWATER UTILITY FEE	$620,000	$12,400,000
SYSTEM DEVELOPMENT CHARGES	$510,000	$10,200,000
MISCELLANEOUS REVENUES	$705,000	$14,100,000
DISCRETIONARY STATE AND/OR FEDERAL FUNDS	$540,000	$10,800,000
NORTH SIDE URBAN RENEWAL DISTRICT	$1,892,500	$37,850,000
TOTAL REVENUES	**$5,112,500**	**$102,250,000**
EXPENDITURES	**AVERAGE ANNUAL AMOUNT**	**ESTIMATED AMOUNT THROUGH 2040**
PERSONNEL SERVICES	$445,000	$8,900,000
MATERIALS AND SERVICES	$550,000	$11,000,000
CAPITAL OUTLAY/MAINTENANCE	$310,000	$6,200,000
TOTAL EXPENDITURES	**$1,305,000**	**$26,100,000**

[6] Long-Term Pavement Performance, U.S. Department of Transportation, Federal Highway Administration

FUNDING SUMMARY	AVERAGE ANNUAL AMOUNT	ESTIMATED AMOUNT THROUGH 2040
FUNDING SUMMARY (REVENUE – EXPENDITURES)	$3,807,500	$76,150,000

POTENTIAL ADDITIONAL FUNDING SOURCES

New transportation funding options include local taxes, assessments and charges, and state and federal appropriations, grants, and loans. Factors that constrain these resources, include the willingness of local leadership and the electorate to burden citizens and businesses with taxes and fees; the portion of available local funds dedicated or diverted to transportation issues from other competing City programs; and the availability of state and federal funds. The City should consider all opportunities for providing or enhancing funding for the transportation improvements included in the TSP.

Counties and Cities have used the following sources to fund the capital and maintenance aspects of their transportation programs. As described below and summarized in Table 2, they may help to address existing or new needs identified in Newport's TSP.

TABLE 2: POTENTIAL FUNDING OPTIONS

FUNDING OPTION	ALLOWED USE OF FUNDS	ACTION REQUIRED TO IMPLEMENT	EXAMPLE CHARGE	POTENTIAL ADDITIONAL ANNUAL REVENUE
TRANSPORTATION UTILITY FEE	Capital improvements or maintenance	City Council action	$1 per month for residential units and $.01 per month per square foot for non-residential uses	$450,000
LOCAL FUEL TAX INCREASE	Capital improvements or maintenance	Voter Approval	+Four cents per gallon during the winter and +two cents per gallon during summer	$253,000
COUNTY VEHICLE REGISTRATION FEE	Capital improvements or maintenance	Voter Approval (County- wide)	$20 for passenger cars, and $5 for motorcycles per year	$400,000
PROPERTY TAX LEVY	Capital improvements or maintenance	Voter Approval	$0.20 per $1,000 in assessed value (per year, for 5 years)	$300,000 (per year, for 5 years)

FUNDING OPTION	ALLOWED USE OF FUNDS	ACTION REQUIRED TO IMPLEMENT	EXAMPLE CHARGE	POTENTIAL ADDITIONAL ANNUAL REVENUE
LOCAL IMPROVEMENT DISTRICTS	Capital improvements	Affected Property Owners	n/a	n/a
DEBT FINANCING	Capital improvements	Varies	n/a	n/a

TRANSPORTATION UTILITY FEE

A transportation utility fee is a recurring monthly charge that could be paid by all residences and businesses within the City. The City can base the fee on the estimated number of trips a particular land use generates or as a flat fee per residence or business. This fee is typically collected through regular utility billing; however, it could be collected as a separate stand-alone bill. Existing law places no express restrictions on the use of transportation utility fee funds, other than the restrictions that normally apply to the use of government funds. Some local agencies utilize the revenue for any transportation related project, including construction, improvements and repairs; however, many choose self-imposed restrictions or parameters on the use of the funds.

For every $1.00 per month in charged rates for residential units and $0.01 per month per 1,000 square feet of non-residential uses in the City, the City could expect to collect about $450,000 annually. Philomath, for example, charges a fee of $4 per month for single family residential units, $3.20 per month for multi-family units, and between $13.60 and $45.50 (based on type and size of the land use) per month for non-residential uses.

LOCAL FUEL TAX INCREASE

To estimate the potential revenue generated from a local fuel tax increase in Newport, the monthly gallons of fuel utilized in Newport was obtained. Newport fuel distributors collected revenue on around 767,000 gallons of fuel per month during the summer and $675,000 gallons of fuel per month during the winter. A local fuel tax increase to five cents per gallon year around could generate an additional $45,000 monthly, $253,000 annually or $5.0 million through 2040.

COUNTY VEHICLE REGISTRATION FEE

The State of Oregon currently requires vehicle owners to register their vehicles and then renew their registration on a 2-year or 4-year basis. The State's biennial registration fee is between $122 and $152 for non-electric passenger cars and $78 for motorcycles. In addition to the State fee, Multnomah, Washington, and Clackamas are the only Counties that also have a vehicle registration fee. The Multnomah County biennial fee is $112 for passenger vehicles and $78 for motorcycles, while the Washington and Clackamas County biennial fees are $60 for passenger vehicles and $34 and $30 respectively for motorcycles.

Vehicle registration fees for Counties in Oregon can be enacted by ordinance, but if a County has a population less than 350,000 residents (like Lincoln County), then the ordinance requires voter approval. Under State law, 40 percent of the collected fee must go to the Cities within a County, unless they agree to a different percentage.

Lincoln County has 49,876 registered passenger cars, and 1,716 registered motorcycles. As an example, with a biennial registration fee of $20 for passenger cars, and $5 for motorcycles, the County could expect to collect over $1 million annually, with $600,000 going to the County, and $400,000 distributed to Cities, including Newport.

PROPERTY TAX LEVY

Property tax levies are another funding option available to Cities. Voter approval is required to enact a local option tax, and the tax may be imposed for up to five years at a time, at which time a City will need voter approval if it desires to renew the levy. The only exception is that a levy for a specific capital project may be imposed for the expected useful life of the capital project up to a maximum of 10 years. Assuming a rate of $0.20 per $1,000 in assessed value as a five-year levy for the City, the City could expect to collect around $1.5 million over five years.

LOCAL IMPROVEMENT DISTRICTS

Local Improvement Districts (LIDs) can fund capital transportation projects that benefit a specific group of property owners. LIDs require owner/voter approval and a specific project definition. Assessments against benefiting properties pay for improvements. LIDs can supply match for other funds where a project has system wide benefit beyond benefiting the adjacent properties. LIDs are often used for sidewalks and pedestrian amenities that provide local benefit to residents along the subject street. Property owners are assessed a proportional share of the cost at the end of the project or the City may elect to allow for installment payments with interest.

DEBT FINANCING

While not a direct funding source, debt financing is another funding method. Through debt financing, available funds can be leveraged, and the cost can be spread over the project's useful life. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but it is also viewed as an equitable funding source for larger projects because it spreads the burden of repayment over existing and future customers who will benefit from the projects. One caution in relying on debt service is that a funding source must still be identified to fulfill annual repayment obligations. Three methods of debt financing are listed below:

- General Obligation (GO) Bonds – Subject to voter approval, a City can issue GO bonds to debt finance capital improvement projects. GO bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property throughout the City (i.e., a property tax increase). Depending on the critical nature of projects identified in the TSP and the willingness of the electorate to accept increased taxation for transportation improvements, voter approved GO bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.

- Limited Tax General Obligation (LTGO) Bonds – Limited Tax General Obligation (LTGO) Bonds are similar to General Obligation (GO) bonds; however, they do not have to be voted on by constituents. A City pledges its general revenues to bondholders along with the utility revenues. The advantages to this option are that it does not require reserves or coverage (such as Revenue bonds) and does not require a vote.
- Revenue Bonds – Revenue bonds are debt instruments secured by rate revenue. For a City to issue revenue bonds for transportation projects, it would need to identify a stable source of ongoing rate funding. Interest costs for revenue bonds are slightly higher than for general obligation bonds due to the perceived stability offered by the "full faith and credit" of a jurisdiction.

ODOT STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) FUNDING

ODOT has modified the process for selecting projects that receive STIP funding to allow local agencies to receive funding for projects off the state system. Projects that enhance system connectivity and improve multi-modal travel options are the focus. The updated TSP prepares the City to apply for STIP funding.

ODOT HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) FUNDING

With significantly more funding under the HSIP and direction from the Federal Highway Administration to address safety challenges on all public roads, ODOT will increase the amount of funding available for safety projects on local roads. ODOT will distribute safety funding to each ODOT region, which will collaborate with local governments to select projects that can reduce fatalities and serious injuries, regardless of whether they lie on a local road or a state highway.

MULTIMODAL ACTIVE TRANSPORTATION FUND

In 2017, the Oregon Legislature passed Keep Oregon Moving (House Bill 2017), which includes changes to the existing Connect Oregon Grant Fund program that necessitates aligning the implementing rules with the new statutes. The legislation bifurcated the program into two new parts, with a separate allocation of 7% for multimodal active transportation projects.

In 2019, the Oregon Legislature passed House Bill 2592 to clarify and amend House Bill 2017. The legislation establishes the Multimodal Active Transportation (MAT) Fund for bicycle and pedestrian projects, consisting of 7% of the Connect Oregon Fund plus revenues from Oregon's bicycle excise tax. The MAT is a separate grant program from Connect Oregon and requires a new set of administrative rules. The legislation also clarifies roles and responsibilities between ODOT and the Oregon Department of Parks and Recreation to provide funding to bicycle and pedestrian projects with up to $4M of lottery revenues.

SAFE ROUTES TO SCHOOL PROGRAMS

Safe Routes to School refers to efforts that improve, educate, or encourage children safely walking (by foot or mobility device) or biking to school. ODOT 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. Non-infrastructure programs focus on education and outreach to assure awareness and safe use of walking and biking routes. ODOT manages funding competitions for both infrastructure and non-infrastructure programs at the annual levels of $10 million (increasing to $15 million in 2023) and $300,000 respectively.

OREGON COMMUNITY PATHS (OCP)

Oregon Community Paths combines funds from the Multimodal Active Transportation Fund (formerly Connect Oregon Bike/Ped), Oregon Bicycle Excise Tax, and federal Transportation Alternatives Program to fund primarily off-street pedestrian and bicycle facilities.

IMMEDIATE OPPORTUNITY FUND

The purpose of the Immediate Opportunity Fund is to support primary economic development in Oregon through the construction and improvement of streets and roads. Access to this fund is discretionary and the fund may only be used when other sources of financial support are unavailable or insufficient. The Immediate Opportunity Fund is not a replacement or substitute for other funding sources.

FEDERAL LANDS ACCESS PROGRAM (FLAP)

The Federal Lands 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 program is funded by contract authority from the Highway Trust Fund and subject to obligation limitation. Funds will be allocated among the States using a statutory formula based on road mileage, number of bridges, land area, and visitation. Projects are selected by a Programming Decision Committee established in each State.

APPENDIX J- TECHNICAL MEMORANDUM #10: TRANSPORTATION STANDARDS

TRANSPORTATION STANDARDS MEMO

DATE: June 30, 2021

TO: Project Management Team

FROM: Rochelle Starrett, Kevin Chewuk, Carl Springer | DKS

SUBJECT: Newport TSP Update

Technical Memorandum #10: Transportation Standards

Project #17081-007

This document provides an overview of the transportation system standards recommended for Newport. Included is a detail of the recommended transportation system classifications, including multimodal corridors, to support the movement of all people, details on the recommended design of streets, and performance standards to ensure that the network functions as outlined in this document. Together, these standards will help ensure future facilities are designed appropriately and that all facilities are managed to serve their intended purpose.

MULTIMODAL STREET SYSTEM CLASSIFICATIONS AND CORRIDORS

All streets in Newport include a functional classification and proposed supplemental corridors to help support the movement of all people and help the city work towards achieving the transportation Goals and Objectives. Functional classifications from the 2012 Transportation System Plan (TSP) were reviewed to propose new functional classifications for Newport's streets. The proposed new functional classifications along with the existing roadway functional classification are summarized below. The 2021 TSP update also identifies new supplemental corridors for pedestrian, bicycle, and freight travel. The new corridors identify locations where special priorities for these modes are recommended and help to ensure the transportation system is comfortable, convenient, safe, and well-connected for all users. The roadway functional classification ultimately determines the facility type and cross-section design requirements for each mode.

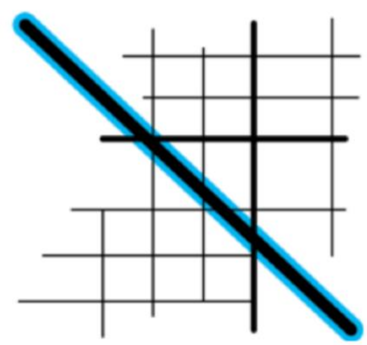
The 2021 TSP recommended functional classification map and 2021 TSP recommended supplemental corridors do not include the proposed US 101 or US 20 couplet alternatives for simplicity. In the event these alternatives are advanced through the 2021 TSP update, revisions to these maps will be required.

ROADWAY FUNCTIONAL CLASSIFICATION

The motor vehicle classifications for streets help support the movement of vehicles by indicating the street's intended level of mobility, access, and use for vehicles. A city's street functional classification system is an important tool for managing the transportation system. It is based on a hierarchical system of roads in which streets of a higher classification, such as arterials, are designed for a higher level of mobility for through movements, while streets of a lower classification are designed to facilitate access to adjacent land uses. From highest to lowest intended use, the recommended classifications are Arterial, Major Collector, Neighborhood Collector, and Local Streets. Streets with higher intended usage generally limit access to adjacent property in favor of more efficient motor vehicle traffic movement (i.e., mobility). Local roadways with lower intended usage have more driveway access and intersections, and generally accommodate shorter trips to nearby destinations.

This recommended set of classifications differs from those in the current 2012 TSP. The City currently uses the designations of Principal Arterial, Minor Arterial, Collector, and Local Streets.

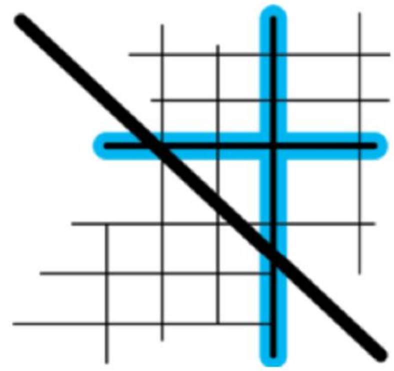
ARTERIAL STREETS



Arterial streets (seen at right) are primarily intended to serve regional and citywide traffic movement. Safety should be the highest priority on Arterials and separation should be provided between motor vehicles and people walking, and bicycling. Safe multimodal crossings should also be provided to key destinations. Arterials provide the primary connection to collector streets. Where an Arterial intersects with a Neighborhood Collector or Local Street, access management and/or turn restrictions may be employed to reduce traffic delay. The only Arterial streets in Newport are US 101 and US 20 which are also classified by the FHWA as Rural Other Principal Arterials.

MAJOR COLLECTOR STREETS

Major Collector Streets (seen at right) are intended to distribute traffic from Arterials to streets of the same or lower classification. Safety should be a high priority on Major Collectors. Where a Major Collector street intersects with a Neighborhood Collector or Local Street, access management and/or turn restrictions may be employed to reduce traffic delay.

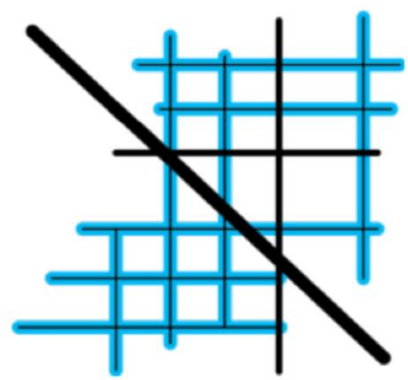


NEIGHBORHOOD COLLECTOR STREETS

Neighborhood Collector streets (seen at right) distribute traffic from Arterial or Major Collector streets to Local Streets. They are distinguishable from Major Collectors in that they principally serve residential areas. Neighborhood Collector streets should maintain slow vehicle operating speeds to accommodate safe use by all modes and through traffic should be discouraged. Where a Neighborhood Collector street intersects with a higher-classified street, access management and/or turn restrictions may be employed to reduce traffic delay and discourage through traffic.

LOCAL STREETS

All streets not classified as Arterial, Major Collector, or Neighborhood Collector streets are classified as Local Streets (seen at right). Local Streets provide local access and circulation for traffic, connect neighborhoods, and often function as through routes for pedestrians and bicyclists. Local Streets should maintain slow vehicle operating speeds to accommodate safe use by all modes.



Private Streets

Private Streets are a special type of Local Streets that are used to facilitate access to specific properties or small neighborhoods. Private Streets can include driveways or private roadway connections that serve four or fewer parcels;[1] the City of Newport is not responsible for maintenance on Private Streets. These streets are not shown on the following functional classification maps.

RECOMMENDED CHANGES TO ROADWAY CLASSIFICATIONS

Figure 1 shows the recommended functional classifications in Newport. These are recommended to better reflect the intended function in the movement of motor vehicles. Due to Newport's unique

[1] *Newport Municipal Code: 13.05.005 Section J.*
https://www.newportoregon.gov/dept/adm/documents/newportmunicipalcode.pdf

topography and environmental constraints, typical spacing guidelines for arterial and collector streets cannot always be applied. The 2021 TSP recommends maintaining US 101 and US 20 as Arterials in conjunction with an off-highway network of collector streets. This change recognizes that many of Newport's existing Minor Arterial roads function as collector streets rather than minor arterials. The 2021 TSP also recommends splitting the collector designation into a new Major Collector and a new Neighborhood Collector classification to identify locations on collectors where local access needs should be accommodated while maintaining a local street character for pedestrians and bicyclists. Introducing two levels of collectors will better establish transportation priorities for different streets in Newport.

The current functional classifications from the 2012 Newport TSP[2] were reviewed to identify locations where reclassifications should be considered. The recommended reclassifications summarized in Figure 1 and Table 1 will provide better system spacing and connectivity.

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES

ROADWAY	EXTENTS	EXISTING FUNCTIONAL CLASSIFICATION	RECOMMENDED FUNCTIONAL CLASSIFICATION
NE 31ST ST	US 101 and NE Harney St	Arterial	Local
SE MOORE DR	HWY 20 and SE Bay Blvd	Minor Arterial	Major Collector
SE BAY BLVD	SE Moor Dr and City Limits	Minor Arterial	Major Collector
SE MARINE SCIENCE DR	US 101	Minor Arterial	Major Collector
SW ABALONE ST	US 101 and SW Abalone St	Minor Arterial	Major Collector
SE FERRY SLIP RD	SE Marine Science Dr and Ash St	Minor Arterial	Major Collector
NE HARNEY ST	End of Road and Hwy 20	Minor Arterial	Major Collector
NE HARNEY ST	NE 31st St and NE Big Creek Rd	Minor Arterial	Neighborhood Collector
NE AVERY ST	City Limits and NE 73rd St	Collector	Major Collector

[2] *Newport Transportation System Plan*, 2012. https://www.oregon.gov/ODOT/Planning/TPOD/tsp/city/city_of_newport_tsp_2012.pdf

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	EXTENTS	EXISTING FUNCTIONAL CLASSIFICATION	RECOMMENDED FUNCTIONAL CLASSIFICATION
NE 73RD ST	NE Avery St and US 101	Collector	Major Collector
NW/NE 11TH ST	NW Oceanview St and NE Eads St	Collector	Major Collector
NW 15TH ST	NW Oceanview Dr and US 101	Collector	Major Collector
NW/SW NYE ST	NW 11th St and SW 2nd St	Collector	Major Collector
NE BENTON ST	NE 12th St and NE 3rd St	Collector	Major Collector
SE COOS ST	NE 3rd St and SE 2nd St	Collector	Major Collector
SE 2ND ST	SE Coos St and SE Benton St	Collector	Major Collector
SW 7TH STREET	SW 2nd St and SW Hurbert St	Collector	Major Collector
SE/SW 10TH ST	SE 2nd St and SW Angle St	Collector	Major Collector
SE FOGARTY ST	4th St and SE Bay Blvd	Collector	Major Collector
SW ELIZABETH ST	W Olive St and SW Bayler St	Collector	Major Collector
ASH ST	SE Ferry Slip Rd and SE 40th St	Collector	Major Collector
SE 40TH ST/SE HARBOR DRIVE	US 101 and SE College Way	Collector	Major Collector
SE 62ND PL	US 101 and End of Road	Collector	Major Collector
SW 9TH ST	SW Angle St and SW Bay St	Collector	Major Collector
SW NATERLIN DR	US 101 and SW Bay St	Collector	Major Collector

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	**EXTENTS**	**EXISTING FUNCTIONAL CLASSIFICATION**	**RECOMMENDED FUNCTIONAL CLASSIFICATION**
SW BAY ST	SW Naterlin Dr and SW Bay Blvd	Collector	Major Collector
SW BAY BLVD	SW Bay St and SE Moore Dr	Collector	Major Collector
NW 6TH ST	NW Nye St and US 101	Collector	Major Collector
NE 6TH ST	US 101 and NE Benton St	Collector	Major Collector
NE 3RD ST	NE Eads St and NE Harney St	Collector	Major Collector
NE YAQUINA HEIGHTS DR	NE Harney St and US 101	Collector	Major Collector
SW CANYON WAY	SW 10th St and SW Fall St	Collector	Major Collector
SW HURBERT ST	SW 10th St and SW 7th St	Collector	Major Collector
SW FALL ST	SW Canyon Way and SW Bay Blvd	Collector	Major Collector
SE 35TH ST	SE Ferry Slid Rd and End of Road	Collector	Major Collector
60TH ST	US 101 and NW Gladys St	Collector	Neighborhood Collector
55TH ST	58th St and US 101	Collector	Neighborhood Collector
NE 36TH ST	US 101 and NE Harney St	Collector	Neighborhood Collector
NW OCEANVIEW ST	US 101 and NW 12th St	Collector	Neighborhood Collector
NW EDENVIEW WAY	NW Oceanview St and NW 20th St	Collector	Neighborhood Collector

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	**EXTENTS**	**EXISTING FUNCTIONAL CLASSIFICATION**	**RECOMMENDED FUNCTIONAL CLASSIFICATION**
NW/NE 20TH ST	NW Edenview way and NE Crestview Pl	Collector	Neighborhood Collector
NW SPRING ST	NW 12th St and NW 8th St	Collector	Neighborhood Collector
NW 8TH ST	NW Spring St and NW Coast St	Collector	Neighborhood Collector
NW NYE ST	NW 15th St and NW 11th St	Collector	Neighborhood Collector
NE 12TH ST	US 101 and NE Eads St	Collector	Neighborhood Collector
NE EADS ST	12th Street and Hwy 20	Collector	Neighborhood Street
NE 6TH ST	NE Benton St and NE Eads St	Collector	Neighborhood Collector
NW 6TH ST	NW Coast St and NW Nye St	Collector	Neighborhood Collector
NW 3RD ST	US 101 and NW Cliff St	Collector	Neighborhood Collector
W OLIVE ST	US 101 and SW Elizabeth St	Collector	Neighborhood Collector
SW 7TH ST	SW Hurbert St and SW Bayley St	Collector	Neighborhood Collector
SW HURBERT ST	SW 7th St and SW 2nd St	Collector	Neighborhood Collector
SW ABBEY ST	SW 6th St and SW 11th St	Collector	Neighborhood Collector
SW HARBOR WAY	SW 11th St and SW 13th St	Collector	Neighborhood Collector
SW 13TH ST	SW Harbor Way and SW Bay St	Collector	Neighborhood Collector

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	EXTENTS	EXISTING FUNCTIONAL CLASSIFICATION	RECOMMENDED FUNCTIONAL CLASSIFICATION
NW COAST ST	NW 11th St and SW 2nd St	Collector	Neighborhood Collector
SW 2ND ST	SW Elizabeth St and SW Nye St	Collector	Neighborhood Collector
NE 7TH ST	NE Eads St and NE 7th Dr	Collector	Neighborhood Collector
NE 6TH ST	NE 7th Dr and End of Road	Collector	Neighborhood Collector
SW HARTFIELD DR	SW 10th St and SW Bay Blvd	Collector	Neighborhood Collector
60TH ST	NW Gladys St and NW Biggs St	Collector	Local
NW BIGGS ST	NW 60th St and NW 55th St	Collector	Local
NW NYE ST	NW 15th St and NW 16th St	Collector	Local
NE BENTON ST	NE 11th St and NE 12th St	Collector	Local
NE 1ST ST	US 101 and Eads Street	Collector	Local
SW 2ND ST	NW Nye St and SW Angle St	Collector	Local
SW ALDER ST/SW NEFF WAY	SW 2nd St and US 101	Collector	Local
SE 50TH ST/SE 50TH PL	US 101 and End of road	Collector	Local
SE 4TH ST	SE Fogarty St and SE Harney St	Collector	Local
SE HARNEY ST	SE 4th St and SE 2nd St	Collector	Local
SE 2ND ST	SE Harney St and SE Moore Dr	Collector	Local

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	EXTENTS	EXISTING FUNCTIONAL CLASSIFICATION	RECOMMENDED FUNCTIONAL CLASSIFICATION
SE 32ND ST	US 101 and SE Ferry Slip Rd	Collector	Local
SE FOGARTY ST	Hwy 20 and SE 4th St	Local	Major Collector
SW ELIZABETH ST	SW Bayler St and SW Government St	Local	Major Collector
SW GOVERNMENT ST	SW Elizabeth St and Yaquina Bay State Park	Local	Major Collector
YAQUINA BAY STATE PARK	SW Elizabeth St and SW Naterlin Dr	Local	Major Collector
NW GLADYS ST	NW 60th St and NW 55th St	Local	Neighborhood Collector
55TH ST	Pinery and 58th St	Local	Neighborhood Collector
NE 71ST ST	NE Avery St and Iron Mountain Rd	Local	Neighborhood Collector
NW 12TH ST	NW Nye St and US 101	Local	Neighborhood Collector
NW 77TH ST	US 101 and End of Road	Local	Private
NE 70TH ST/NE 70TH ST	NE Avery St and End of Road	Local	Private
NW 68TH ST	US 101 and End of Road	Local	Private
NE WINDHILL DR	NE 54th St and Evergreen Ln	Local	Private
EVERGREEN LN	NE 54h St and End of Road	Local	Private
NE 56TH ST	Evergreen Ln and 57th St	Local	Private

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	**EXTENTS**	**EXISTING FUNCTIONAL CLASSIFICATION**	**RECOMMENDED FUNCTIONAL CLASSIFICATION**
NE 57TH ST	Evergreen Ln and NE 56th St	Local	Private
NE 55TH ST	Evergreen Ln and NE 54th St	Local	Private
NE 54TH ST	NE 55th St and Evergreen Ln	Local	Private
NE 58TH ST/NE 58TH CT	NE Deer Ln and End of Road	Local	Private
NE DEER LN	End of Rd and NE 58th St	Local	Private
NE 60TH CT	NE Deer Ln and Evergreen Ln	Local	Private
NE 59TH ST	NE Deer Ln and End of Road	Local	Private
NE 60TH ST	Evergreen Ln and NE Deer Ln	Local	Private
NE 61ST ST	Evergreen Ln and NE Deer Ln	Local	Private
NE 62ND ST	NE Deer Ln and End of Rd	Local	Private
NE 32ND ST	NE 31st and NE Douglas St	Local	Private
NE DOUGLAS ST	NE 32nd St and NE 35th St	Local	Private
NE COOS ST	NE 32nd St and NE 35th St	Local	Private
NE BENTON ST	NE 32nd St and NE 35th St	Local	Private
NE 33RD ST/NE 33RD DR	NE Benton St and NE Avery St	Local	Private
NE AVERY ST	NE 33rd St and NE 35th St	Local	Private

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	EXTENTS	EXISTING FUNCTIONAL CLASSIFICATION	RECOMMENDED FUNCTIONAL CLASSIFICATION
NE 35TH ST	NE Douglas St and End of Road	Local	Private
NW CHEROKEE LN	NW Wade Way and End of Road	Local	Private
NW 42ND ST	End of Road and US 101	Local	Private
NW 43RD ST	End of Road and US 101	Local	Private
NW 44TH ST	End of Road and US 101	Local	Private
NW 45TH ST	End of Road and US 101	Local	Private
NW 46TH ST	End of Road and US 101	Local	Private
NW 48TH ST	End of Road and US 101	Local	Private
NW 33RD ST	NW Oceanview Dr and End of Road	Local	Private
NE 47TH ST	US 101 and End of Road	Local	Private
NE 50TH ST	US 101 and End of Rd	Local	Private
SW 62ND ST	US 101 ad SW Arbor Dr	Local	Private
SW ARBOR DR	End of Road and End of Road	Local	Private
SW 60TH LOOP	SW Arbor Dr and End of Road	Local	Private
SW 59TH ST	SW Arbor Dr and End of Road	Local	Private
SW 58TH ST	SW Arbor Dr and SW Cupola Dr	Local	Private

TABLE 1: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION CHANGES			
ROADWAY	**EXTENTS**	**EXISTING FUNCTIONAL CLASSIFICATION**	**RECOMMENDED FUNCTIONAL CLASSIFICATION**
SW BARNACLE CT	SW 58th St and End of Road	Local	Private
SW 61ST ST	End of Road and SW Cupola Dr	Local	Private
SW CUPOLA DR	SW 61st and End of Road	Local	Private
SE DOGWOOD ST	SE 35th St and End of Road	Local	Private
SW ANCHOR WAY	US 101 and End of Road	Local	Private

FIGURE 1A: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION – AGATE BEACH

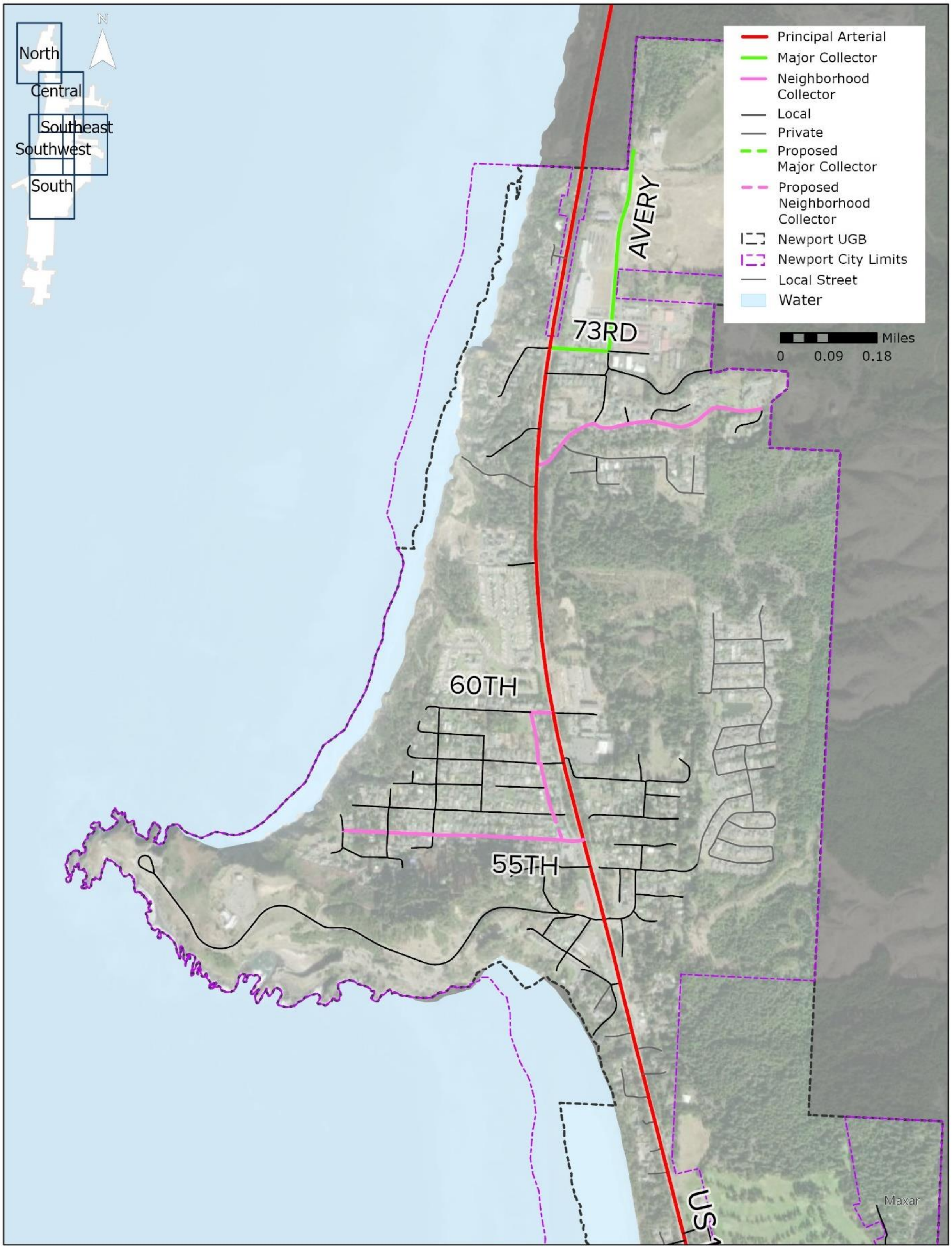


FIGURE 1B: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION – OCEANVIEW/HARNEY

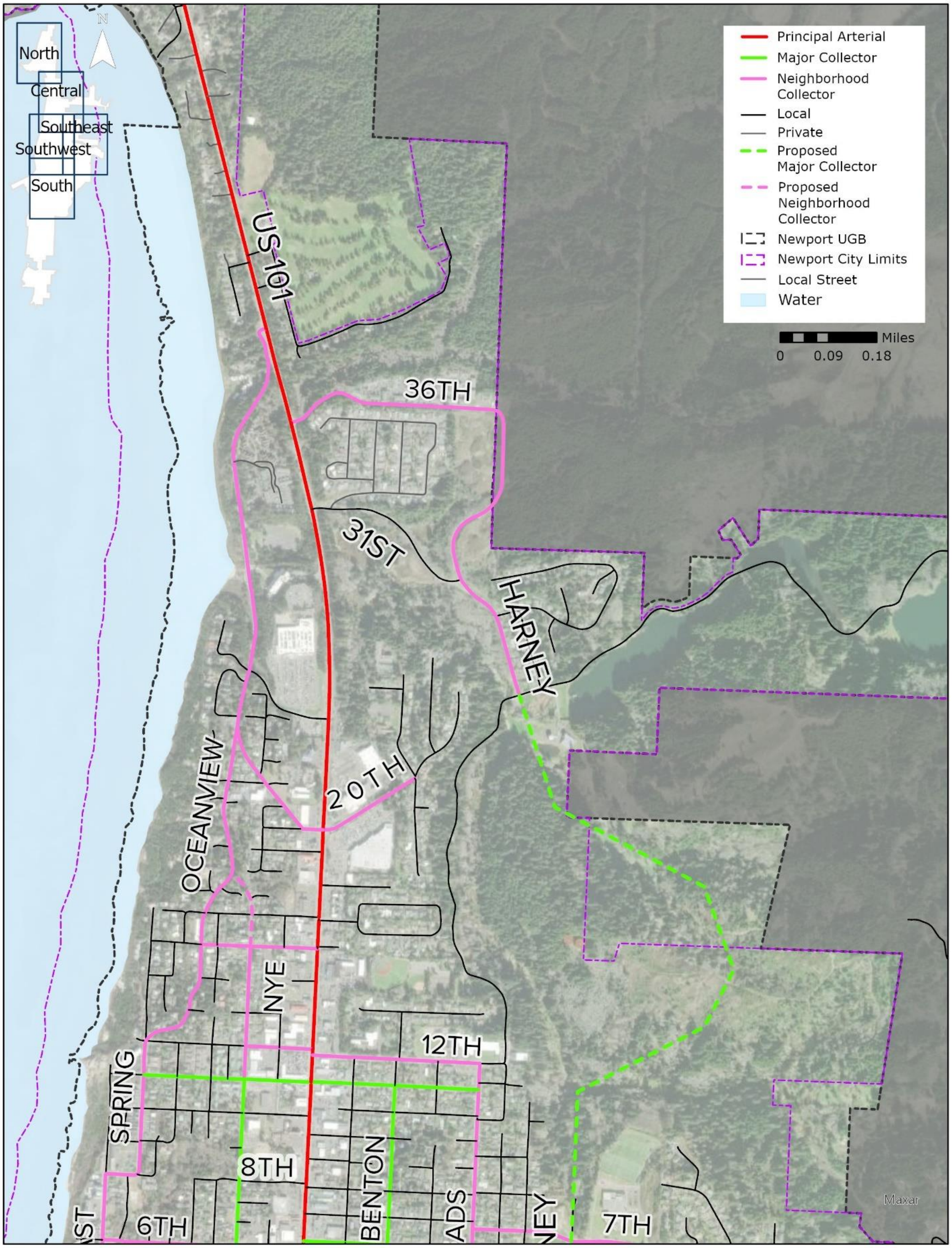


FIGURE 1C: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION – DOWNTOWN

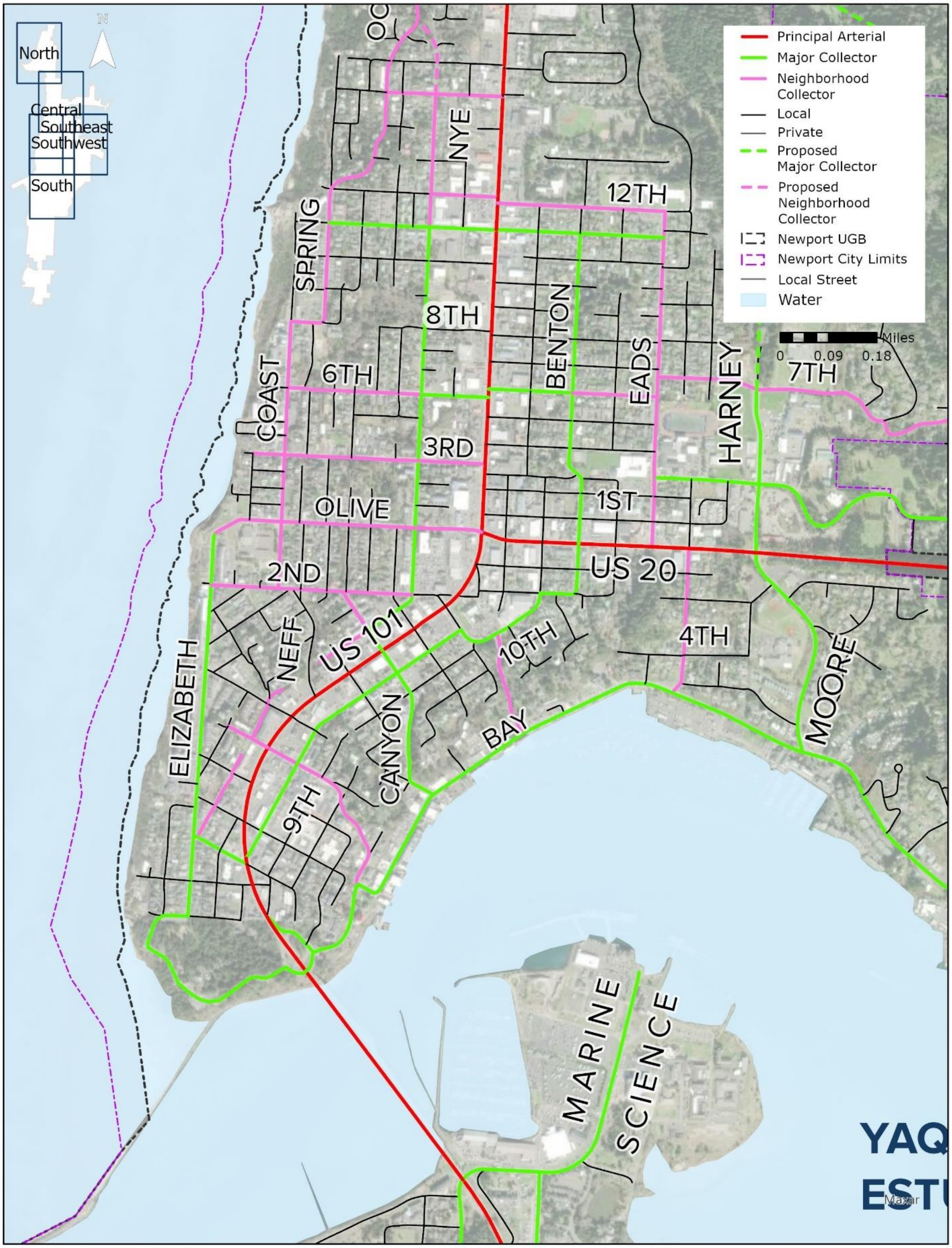


FIGURE 1D: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION – EAST NEWPORT

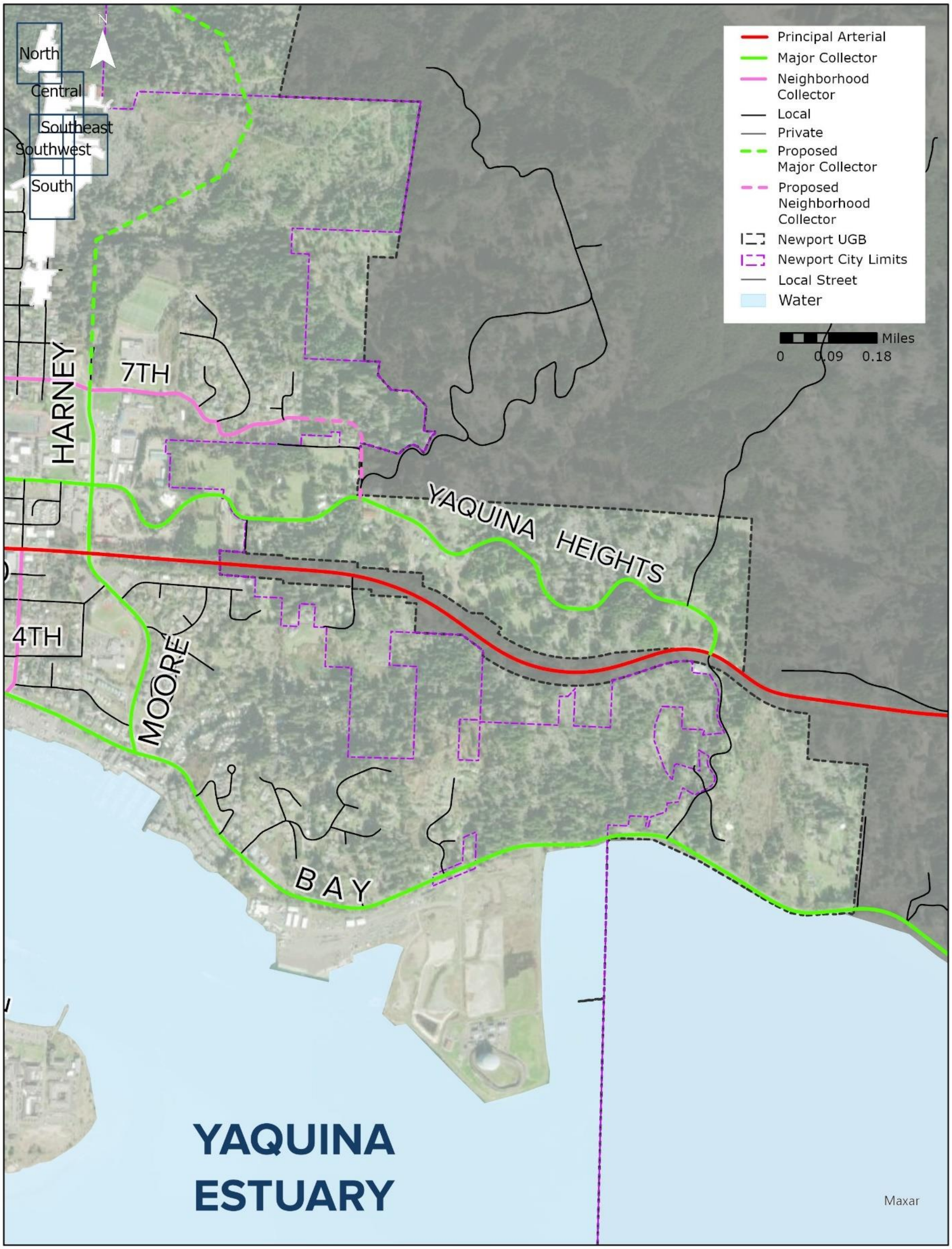
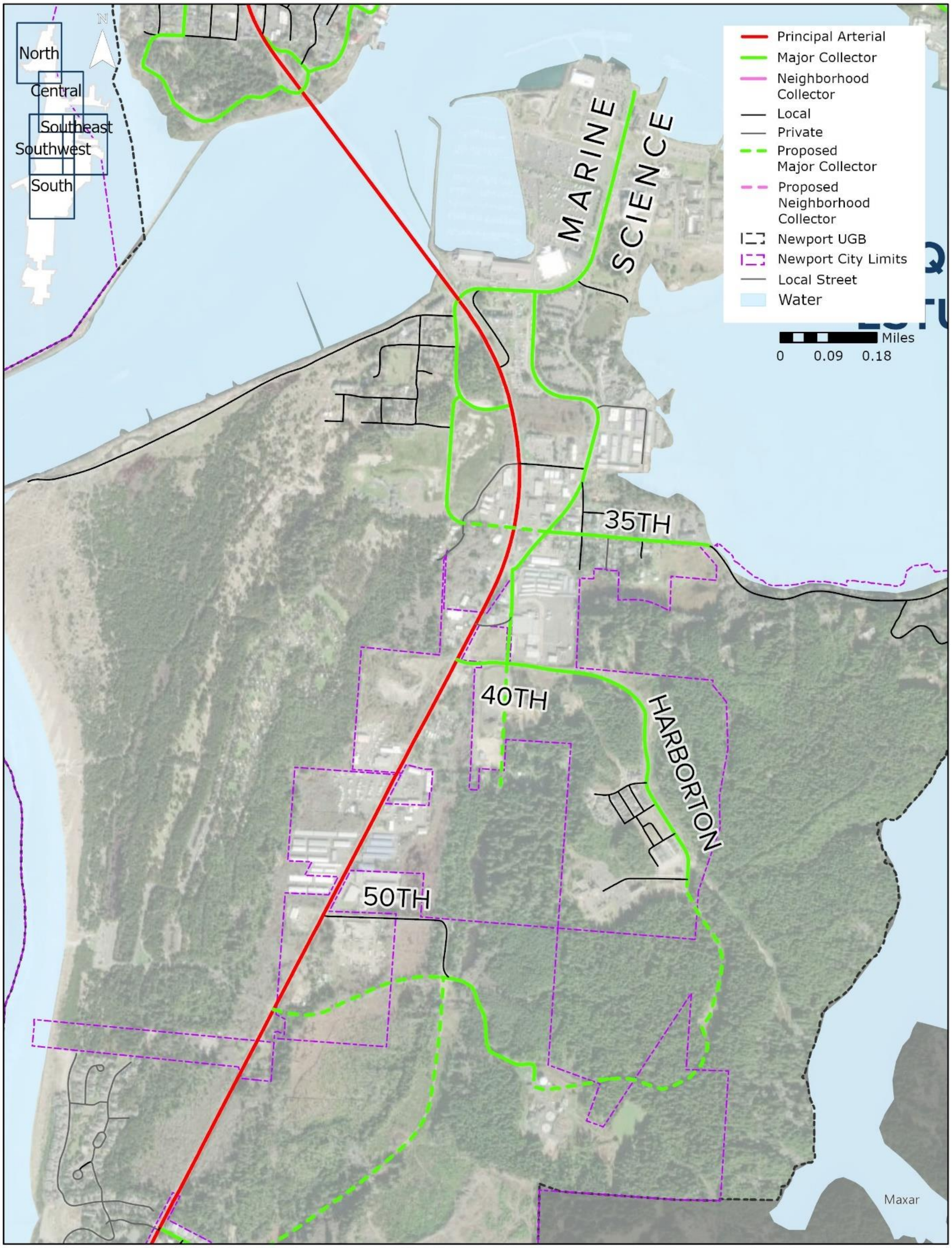


FIGURE 1E: RECOMMENDED ROADWAY FUNCTIONAL CLASSIFICATION – SOUTH BEACH



FREIGHT AND TRUCK CORRIDORS

Newport currently has two designated statewide freight routes. US 101 (north of US 20) is a National Network freight route while US 20 is a designated freight route in the Oregon Highway Plan (OHP). The National Network designates a set of highways based on geometric specifications (e.g., 12 feet travel lanes) specifically for use by large trucks while the OHP identifies freight routes based on the tonnage carried. Both of these corridors are also identified freight reduction review routes that requires the Mobility Advisory Committee to review and approve proposed changes to any reduction in the vehicle carrying capacity of these routes.[3] US 101 south of US 20 is not a National Network freight route, OHP freight route, or reduction review route.

It is also recommended that the city identify local truck routes to supplement the statewide system. The proposed local network, summarized in Figure 2, includes NE 73rd Street, NE Avery Street, NE 36th Street, NE Harney Street, SW/E Bay Boulevard, SE Moore Drive, Yaquina Bay Road, US 101 (south of US 20), SE Marine Science Drive, SE Ferry Slip Road, SE 35th Street, and the future extensions of SE 50th Street and SE 62nd Street.

Newport will benefit from ensuring that its truck routes are designed to accommodate the needs of industrial and commercial activity. Establishing local truck routes that connect industrial areas with the state highway system and implementing freight-specific design treatments makes these routes more desirable for freight travel which can protect residential neighborhoods from freight traffic. Having designated freight routes will help the city better coordinate and improve its efforts regarding both freight and non-freight transportation system users, including the following:

- **Roadway and Intersection Improvements** can be designed for freight vehicles with adjustments for turn radii, sight distance, lane width, turn pocket lengths, and pavement design. Designated local trucks routes should provide wider travel lanes (i.e., 12 feet travel lanes). The intersection/roadway geometry and pavement design should also accommodate turning movements or loads from the identified design vehicle and be consistent with city code.
- **Bicycle and Pedestrian Improvements** – such as protected or separated bike facilities, enhanced pedestrian crossings, and other safety improvements – can be identified to reduce freight impacts to other road users, particularly along bikeways and walkways.
- **Roadway Durability** can be increased by using concrete instead of asphalt in areas with significant freight traffic.
- **Coordination with Businesses and Adjacent Jurisdictions** can ensure that local and regional freight traffic uses Newport's freight routes to travel within the City.

[3] Freight reduction review routes are governed by ORS 366.215. Changes to the horizontal or vertical clearance of the roadway are considered to reduce vehicle carrying capacity. More information on freight reduction review routes is available here: https://www.oregon.gov/ODOT/Planning/Documents/ORS_366.215_Implementation_Guidance.pdf

FIGURE 2A: NEWPORT FREIGHT NETWORK – AGATE BEACH

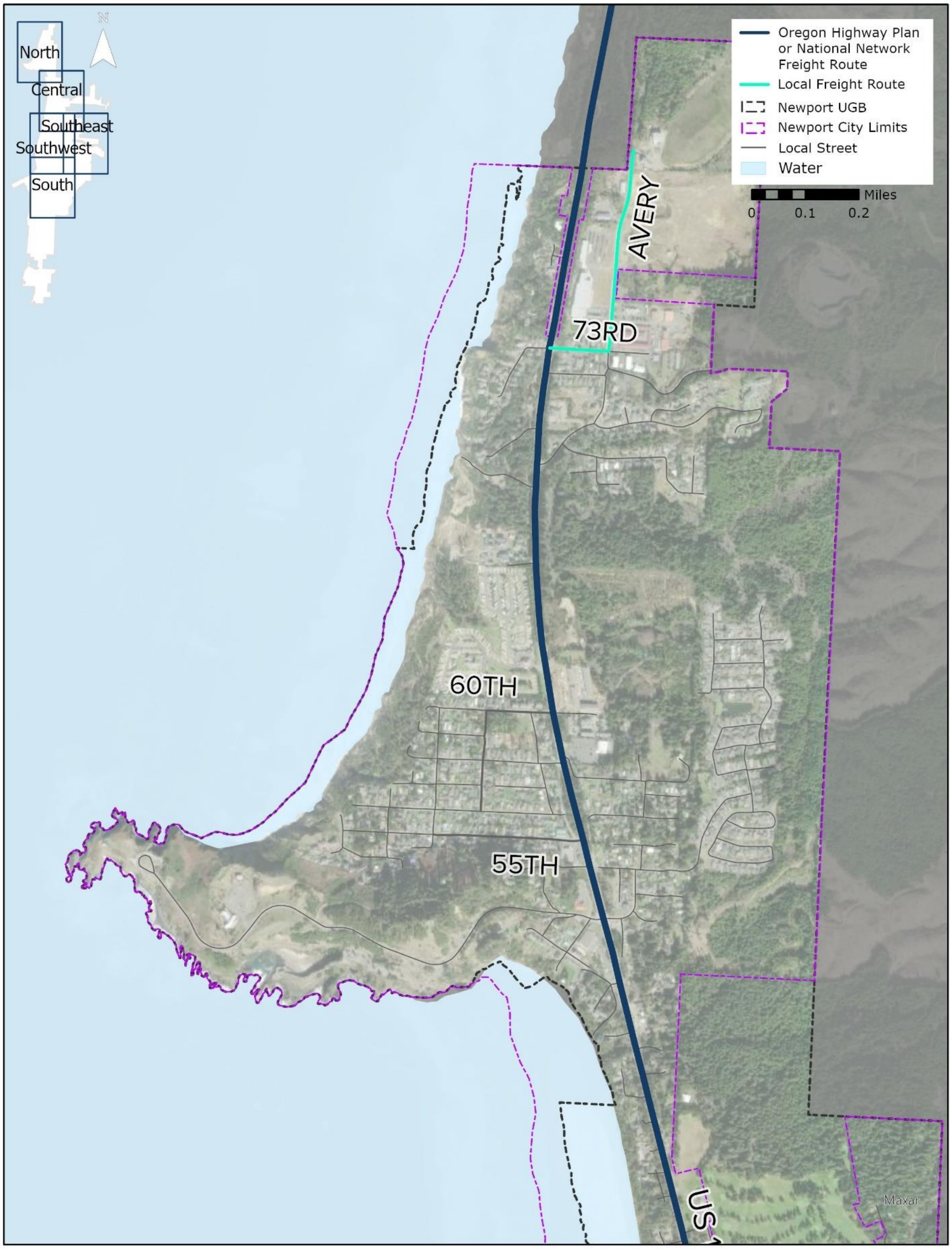


FIGURE 2B: NEWPORT FREIGHT NETWORK – OCEANVIEW/HARNEY

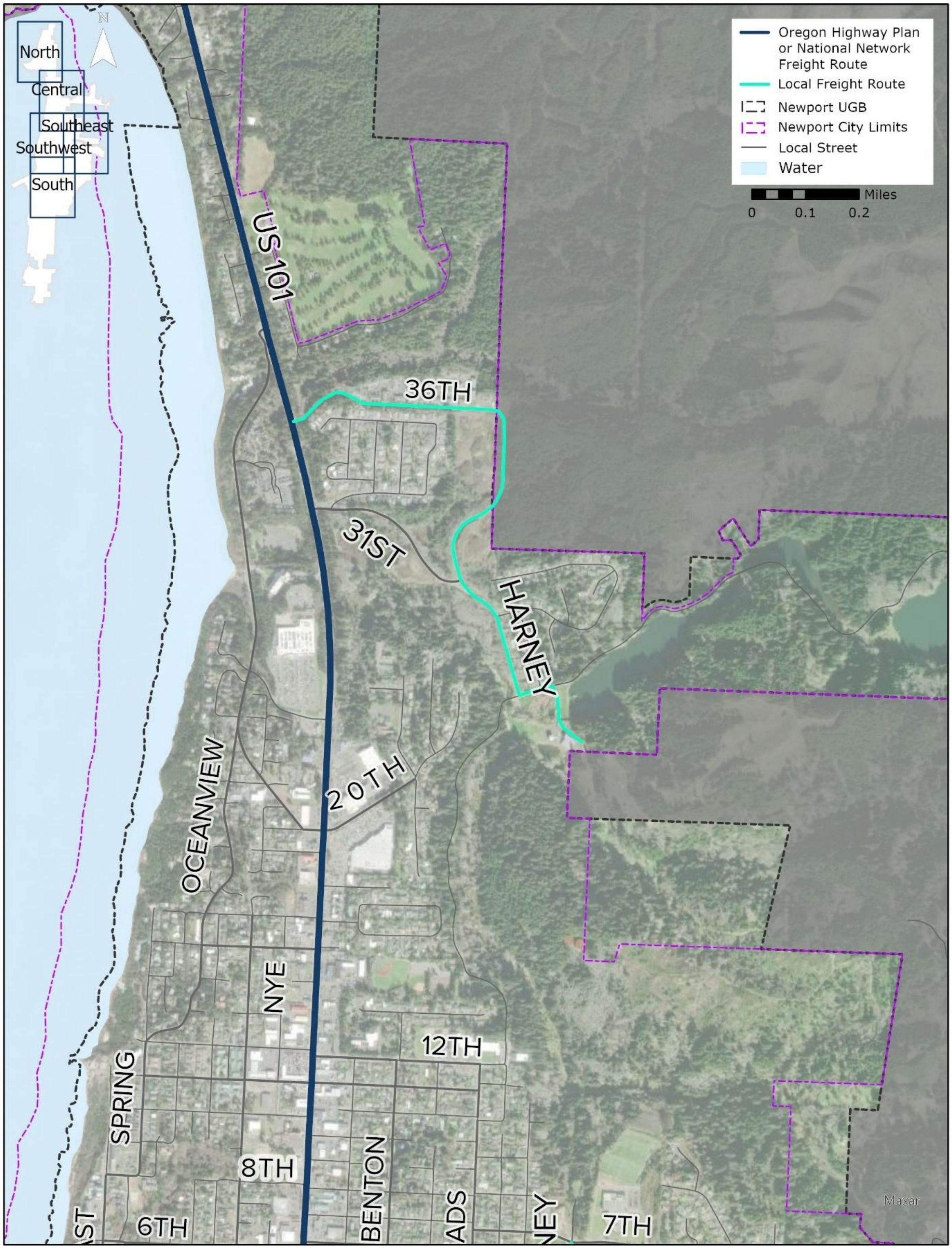


FIGURE 2C: NEWPORT FREIGHT NETWORK – DOWNTOWN

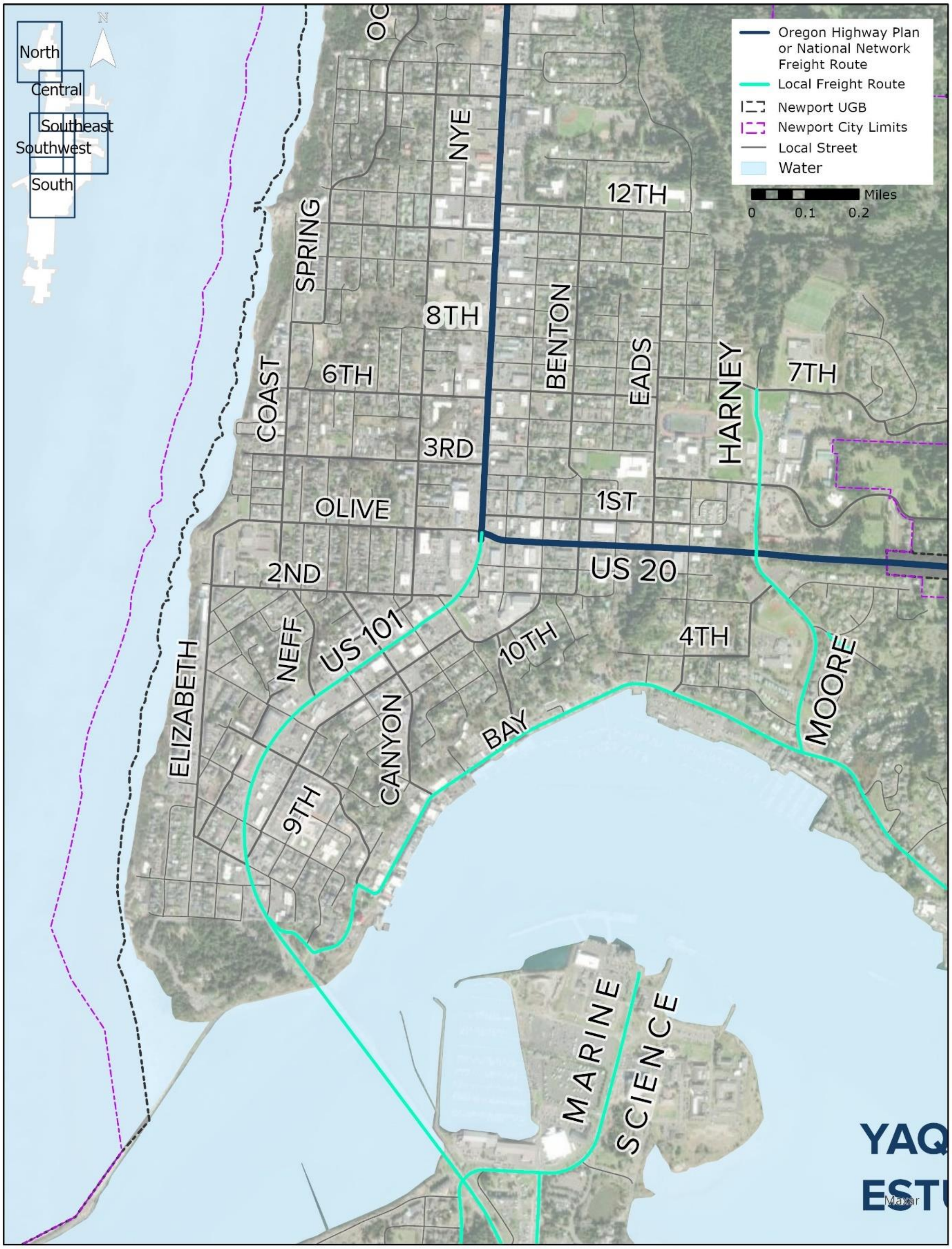


FIGURE 2D: NEWPORT FREIGHT NETWORK – EAST NEWPORT

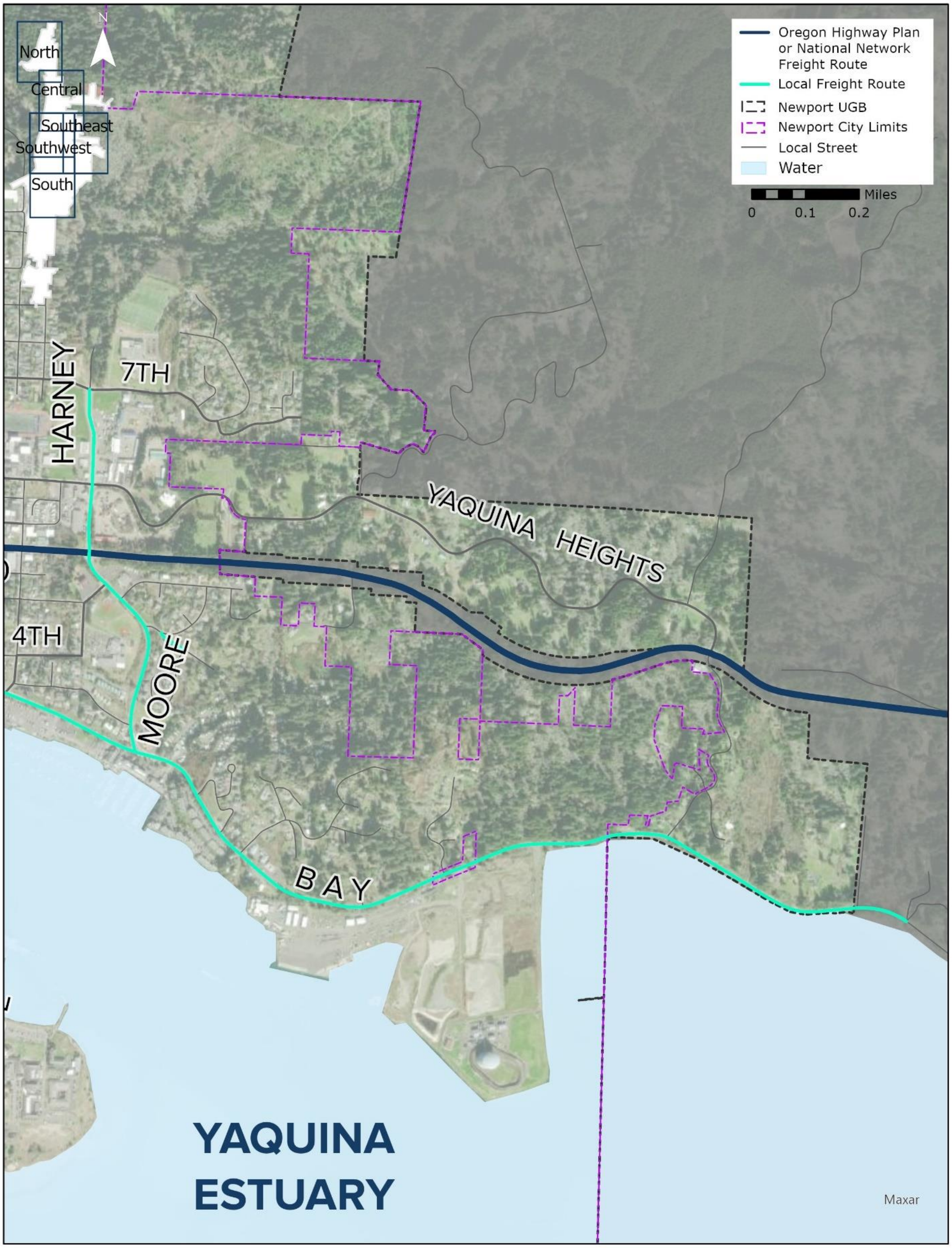
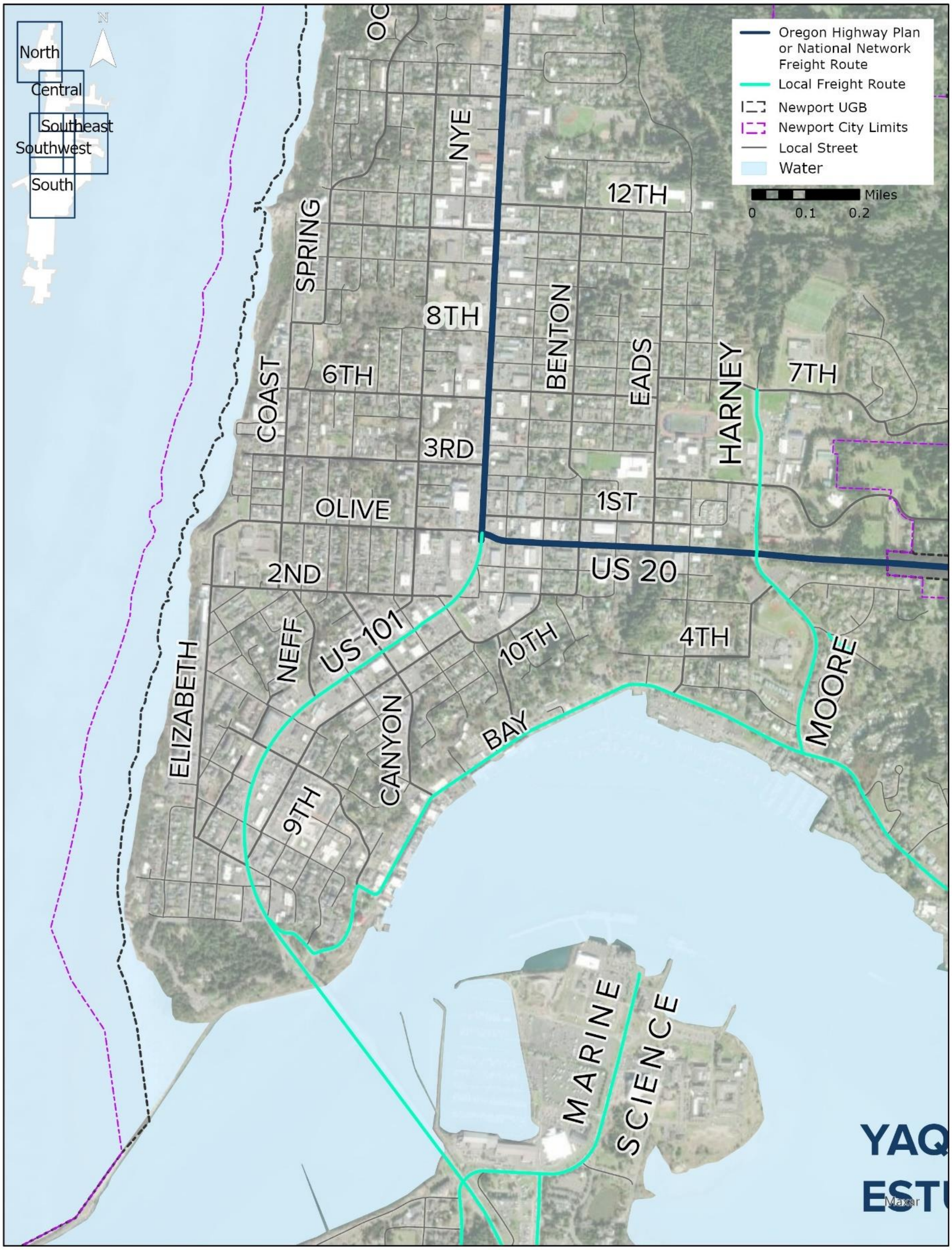


FIGURE 2E: NEWPORT FREIGHT NETWORK – SOUTH BEACH



PEDESTRIAN CORRIDORS

Identifying pedestrian corridors helps to support pedestrian movement and access to adjacent land use by identifying priority routes that connect popular destinations where pedestrian travel should be prioritized. The pedestrian corridors are applied to prioritize sidewalk infill projects and to determine the appropriate (i.e., preferred or acceptable) sidewalk configuration in constrained roadway conditions. Figure 3 shows the recommended pedestrian corridors in Newport, including Major Pedestrian streets and Neighborhood Pedestrian streets. All other streets are Local Pedestrian streets.

MAJOR PEDESTRIAN STREET

A Major Pedestrian street includes the most important corridors for pedestrian travel that link different parts of the city and provide access to Newport's existing attractions (e.g., Nye Beach, Bayfront). These streets should include safe, convenient, and attractive facilities for pedestrians.

NEIGHBORHOOD PEDESTRIAN STREET

A Neighborhood Pedestrian street includes those connecting to Major Pedestrian streets and those providing access to schools, pedestrian trails, parks, open spaces, and other significant destinations. These streets may include safe, convenient, and attractive facilities for pedestrians.

LOCAL PEDESTRIAN STREET

All streets not classified as Major Pedestrian or Neighborhood Pedestrian streets are classified as Local Pedestrian streets. Local Pedestrian streets provide local access and circulation for pedestrians and must include safe and convenient facilities for pedestrians that are appropriate to the local street context.

FIGURE 3A: NEWPORT'S PROPOSED PEDESTRIAN CORRIDORS – AGATE BEACH

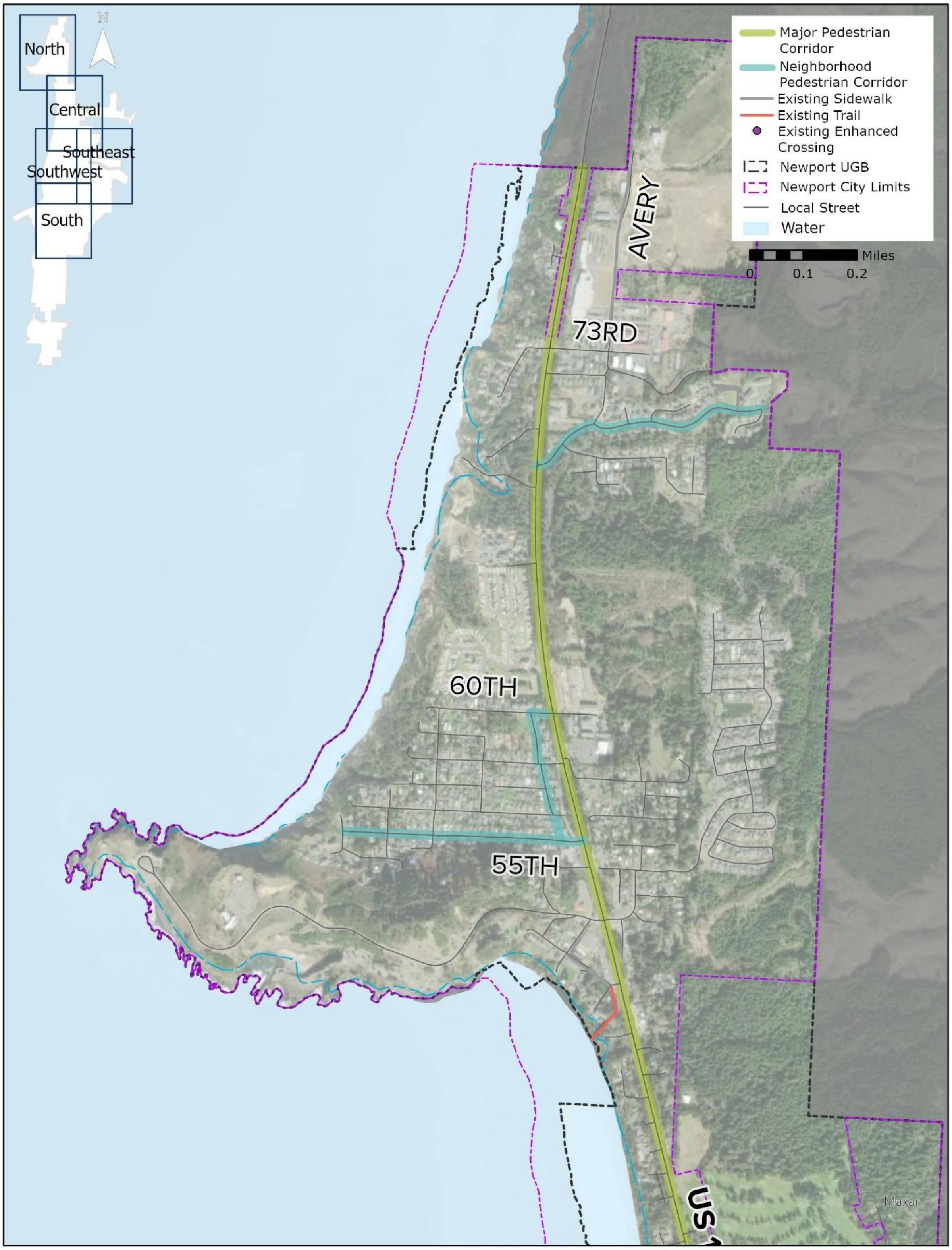


FIGURE 3B: NEWPORT'S PROPOSED PEDESTRIAN CORRIDORS – NYE BEACH

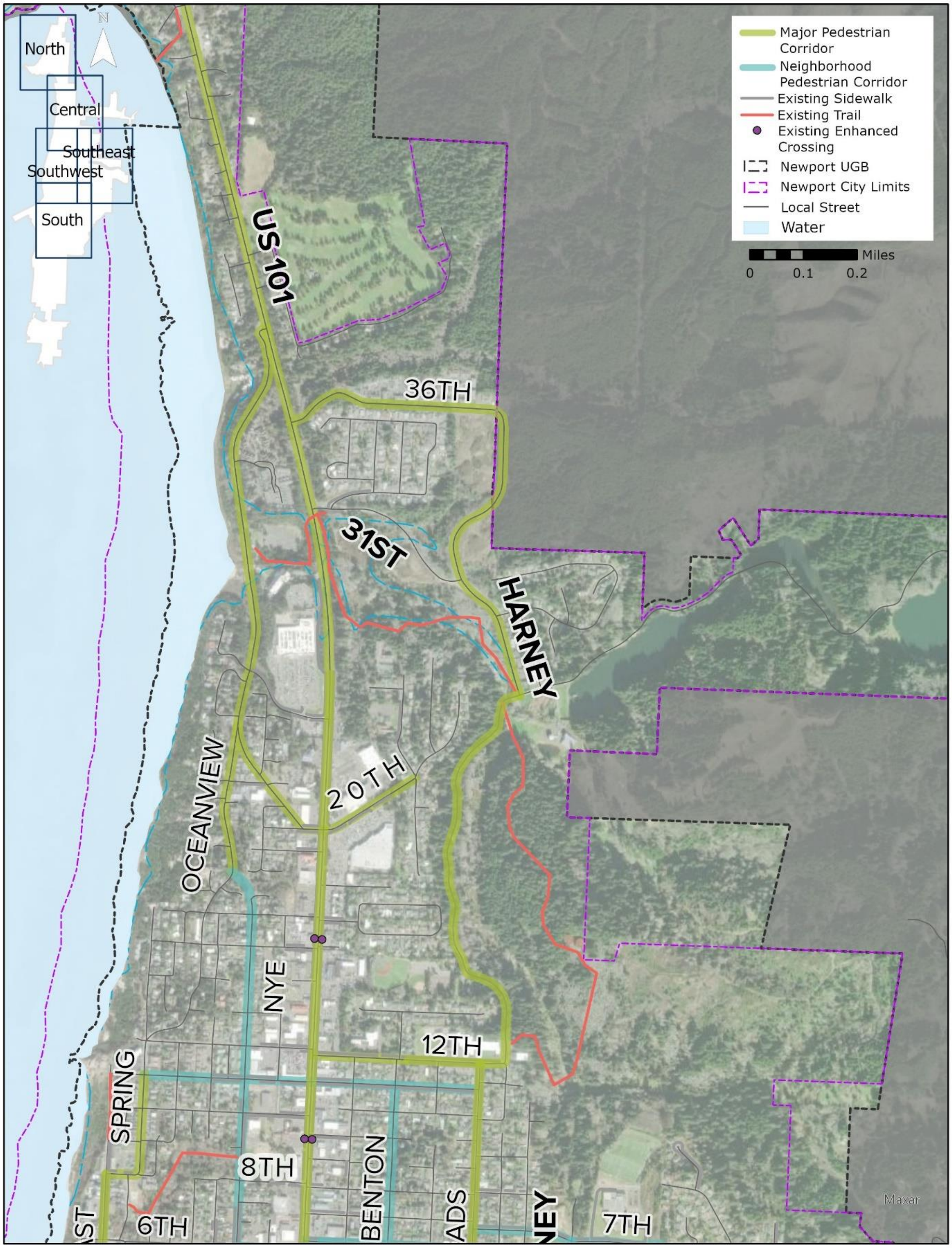


FIGURE 3C: NEWPORT'S PROPOSED PEDESTRIAN CORRIDORS – DOWNTOWN

FIGURE 3D: NEWPORT'S PROPOSED PEDESTRIAN CORRIDORS – EAST

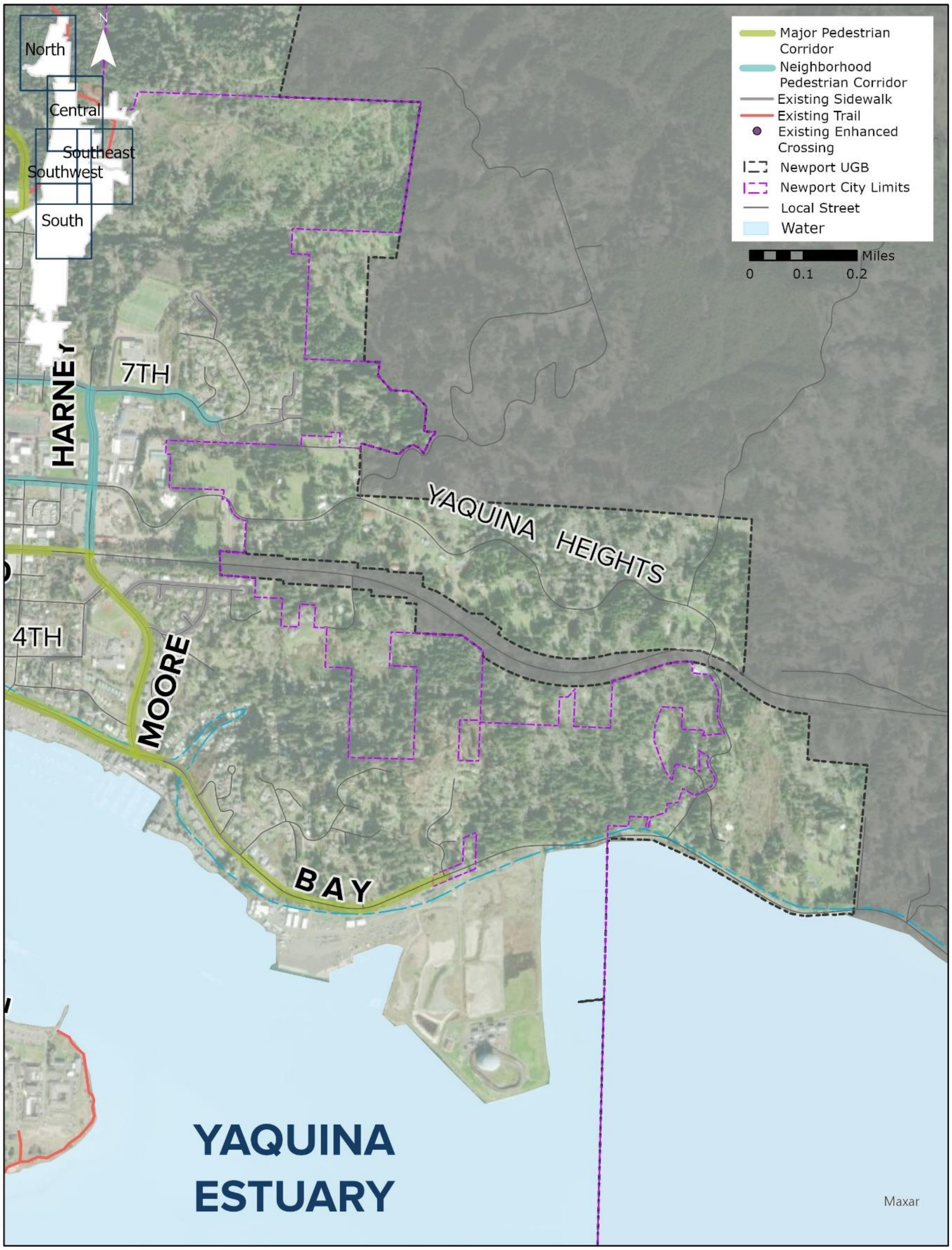
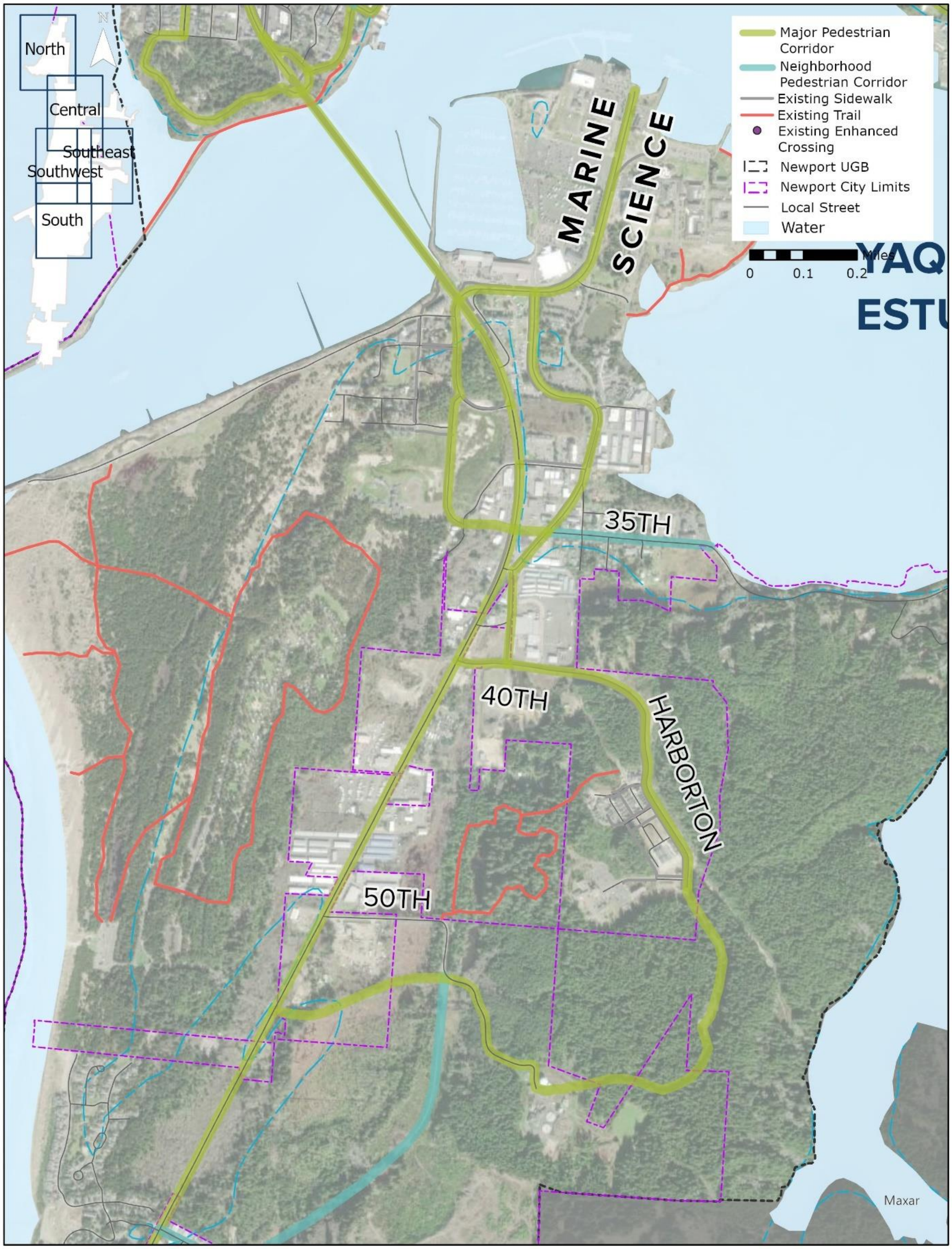


FIGURE 3E: NEWPORT'S PROPOSED PEDESTRIAN CORRIDORS – SOUTH BEACH



BICYCLE CORRIDORS

Identifying bicycle corridors helps to support the movement of people riding bikes. The bicycle corridors are applied to prioritize bicycle improvement projects and to determine the appropriate (i.e., preferred or acceptable) bicycle facility in constrained roadway conditions. Figure 4 shows the recommended bicycle corridors for Newport, including Major Bicycle, Neighborhood Bicycle, and Local Bicycle streets. The identified corridors are intended to provide a complete and connected bicycle network to facilitate travel for Newport's residents on city streets. Where either US 101 or US 20 provide the only travel connection, a corridor was also identified on the state system. However, bicycle facilities constructed on state roadways are subject to review and approval by ODOT based on guidance from the Blueprint for Urban Design (BUD)[4] and the Highway Design Manual (HDM),[5] and consequently, lack of a bicycle corridor designation on US 101 or US 20 does not preclude the construction of future bicycle improvements.

MAJOR BICYCLE STREET

A Major Bicycle street includes corridors linking different parts of the city, and those providing primary access to key attractions within Newport. The bike facilities should be high quality for the roadway functional classification and emphasize safe, convenient, and comfortable bicycle travel. Although both US 101 and US 20 provide key connections for bicycle travel within Newport, without significant capital improvements, these streets will likely remain a barrier for bicyclists. Where feasible, a Major Bicycle street has been designated on parallel city streets that are more suitable to bicycle travel.

NEIGHBORHOOD BICYCLE STREET

A Neighborhood Bicycle street includes those connecting to Major Bicycle streets and those providing access to schools, bicycle paths, parks, open spaces, and other significant destinations. These routes establish direct and convenient bicycle routes and provide bicycle facility coverage within ¼ of a mile of any given point in the city. These routes may include wayfinding to direct bicyclists to other areas of Newport

LOCAL BICYCLE STREET

All streets not classified as Major Bicycle or Neighborhood Bicycle streets are classified as Local Bicycle streets. Local Bicycle streets provide local access and circulation for bicyclists in a shared roadway environment (without shared lane markings). The low vehicle speeds and volumes make them suitable for shared bicycle travel.

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[4] ODOT. *Blueprint for Urban Design.* https://www.oregon.gov/odot/Engineering/Documents_RoadwayEng/Blueprint-for-Urban-Design_v1.pdf. 2020.

[5] ODOT. *Highway Design Manual.* https://www.oregon.gov/odot/Engineering/Pages/Hwy-Design-Manual.aspx. 2012.

FIGURE 4A: NEWPORT'S PROPOSED BICYCLE CORRIDORS – AGATE BEACH

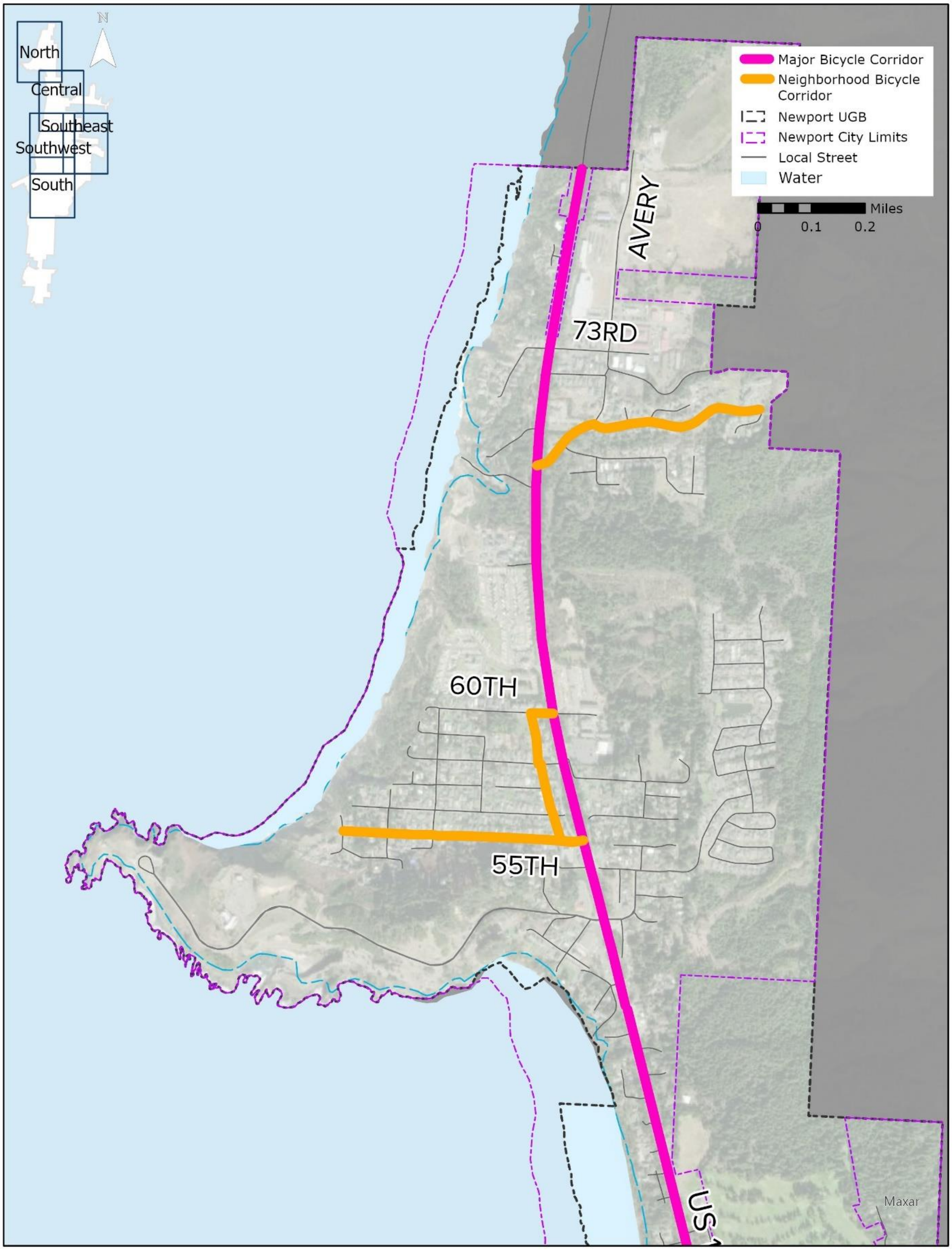


FIGURE 4B: NEWPORT'S PROPOSED BICYCLE CORRIDORS – NYE BEACH

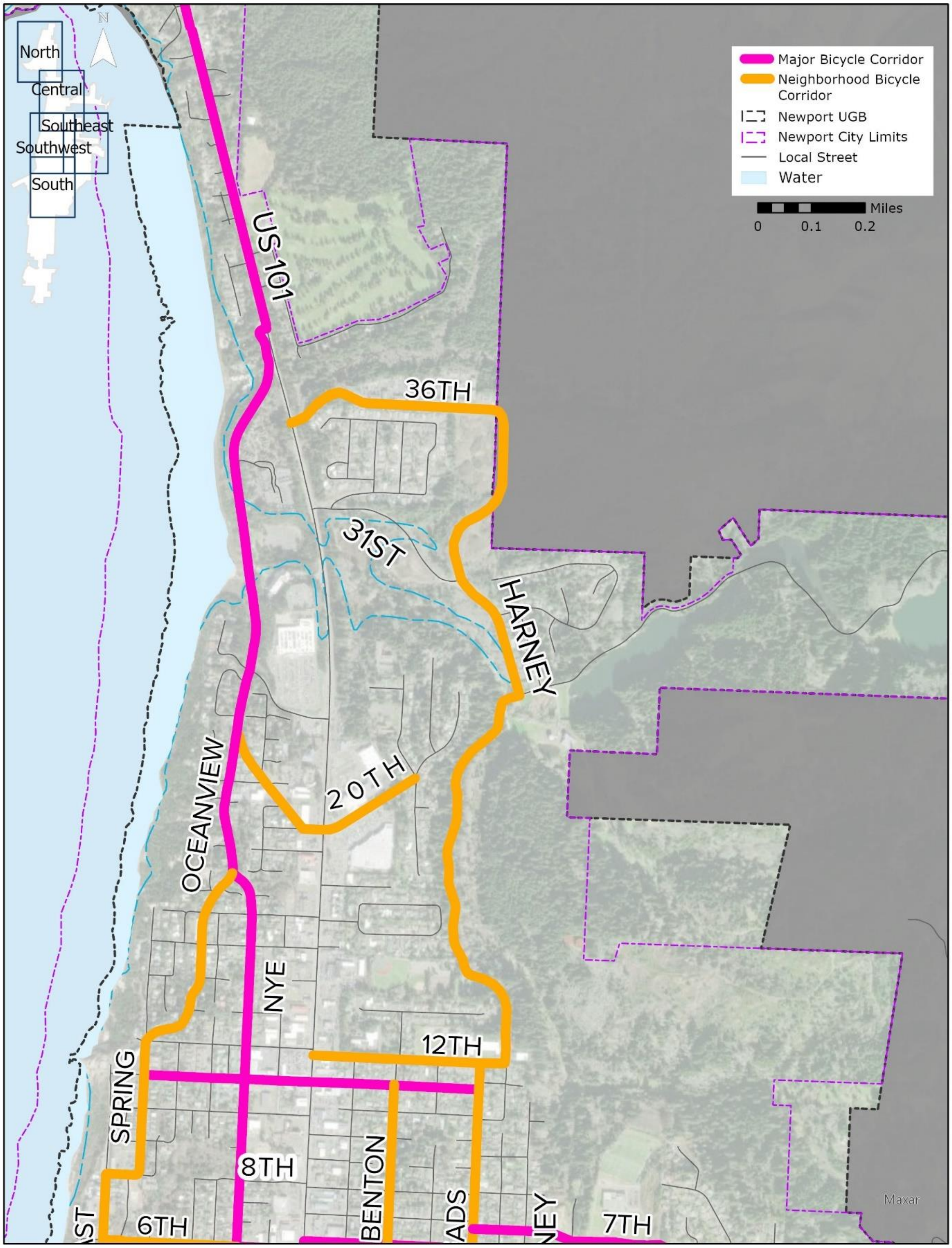


FIGURE 4C: NEWPORT'S PROPOSED BICYCLE CORRIDORS – DOWNTOWN

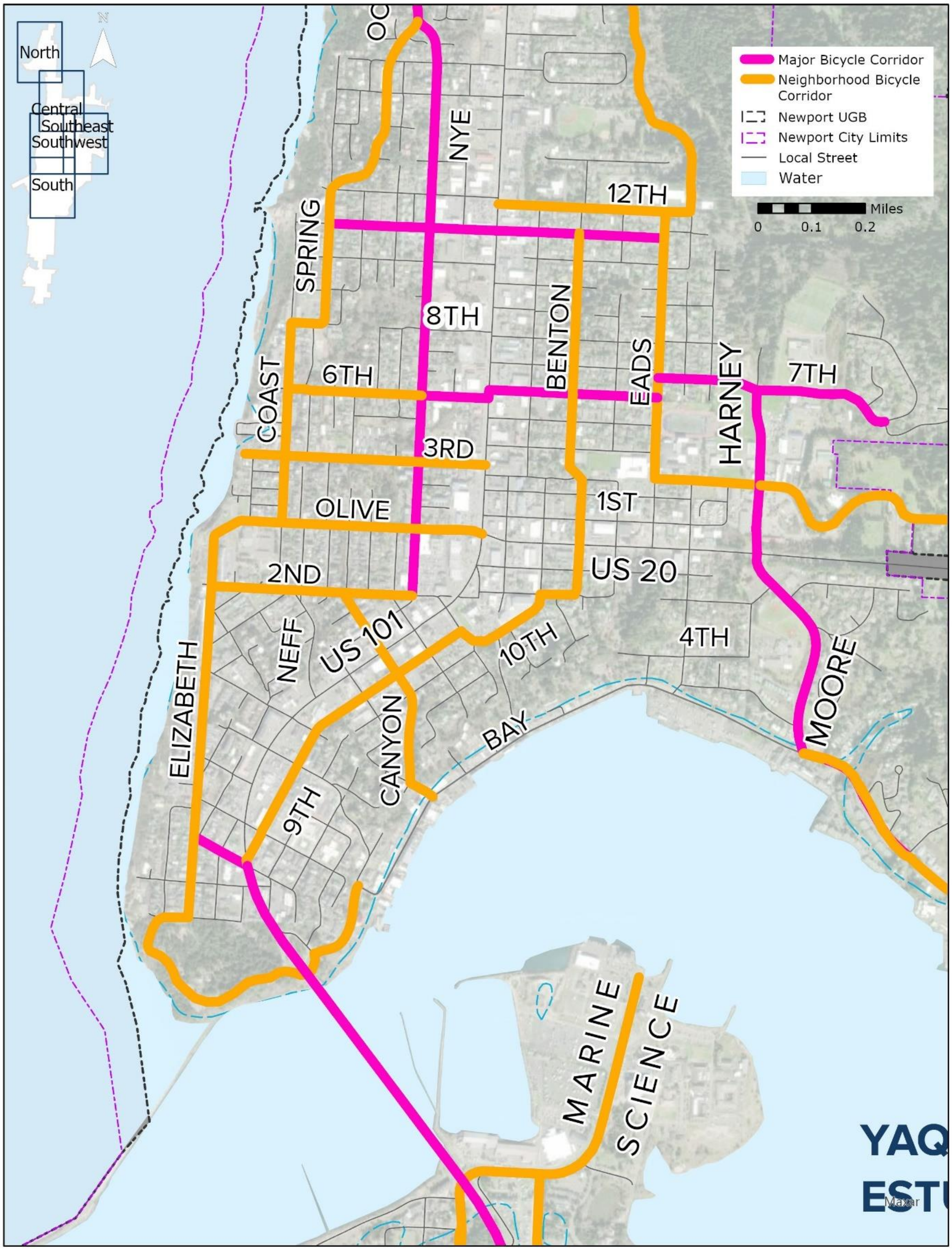


FIGURE 4D: NEWPORT'S PROPOSED BICYCLE CORRIDORS – EAST

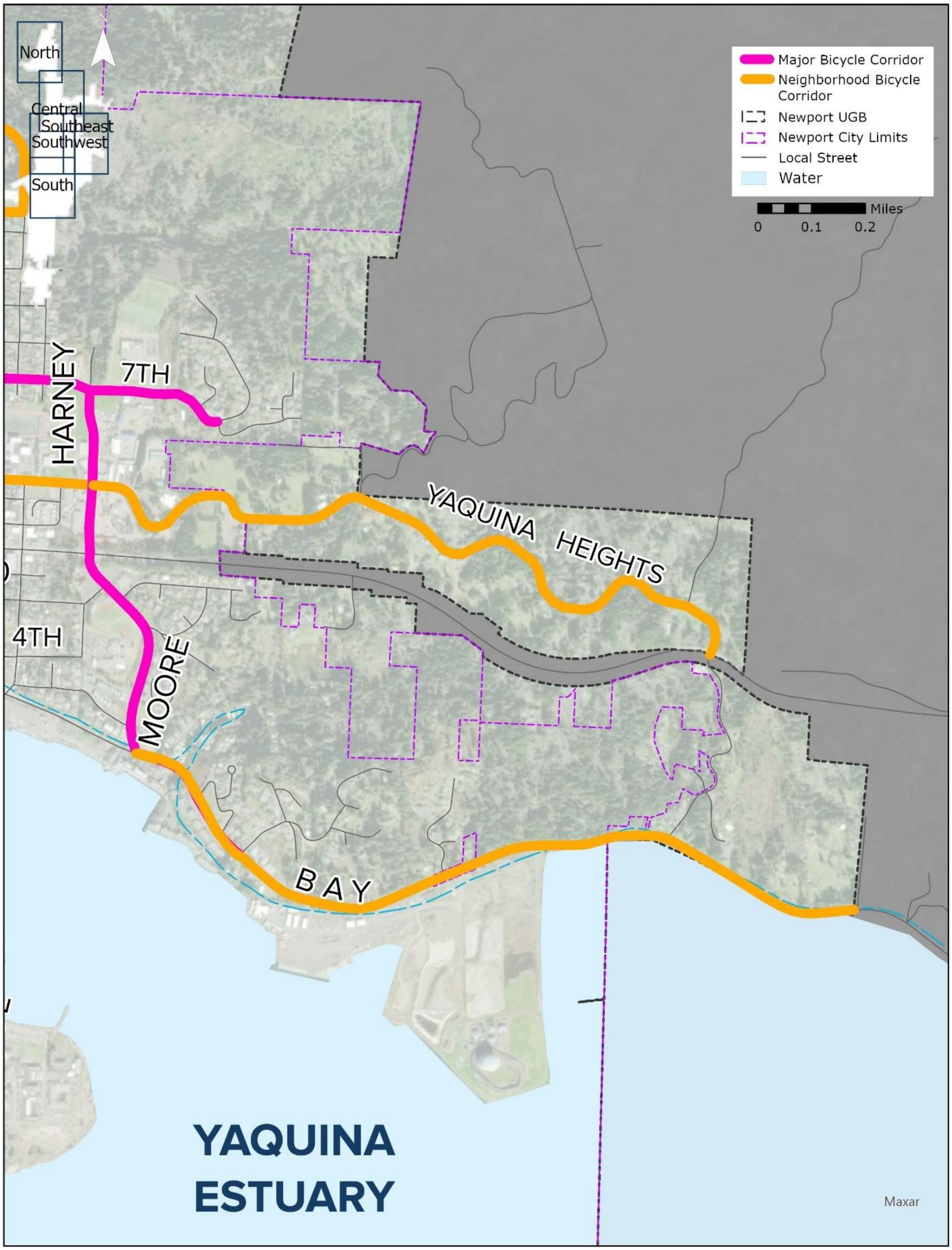
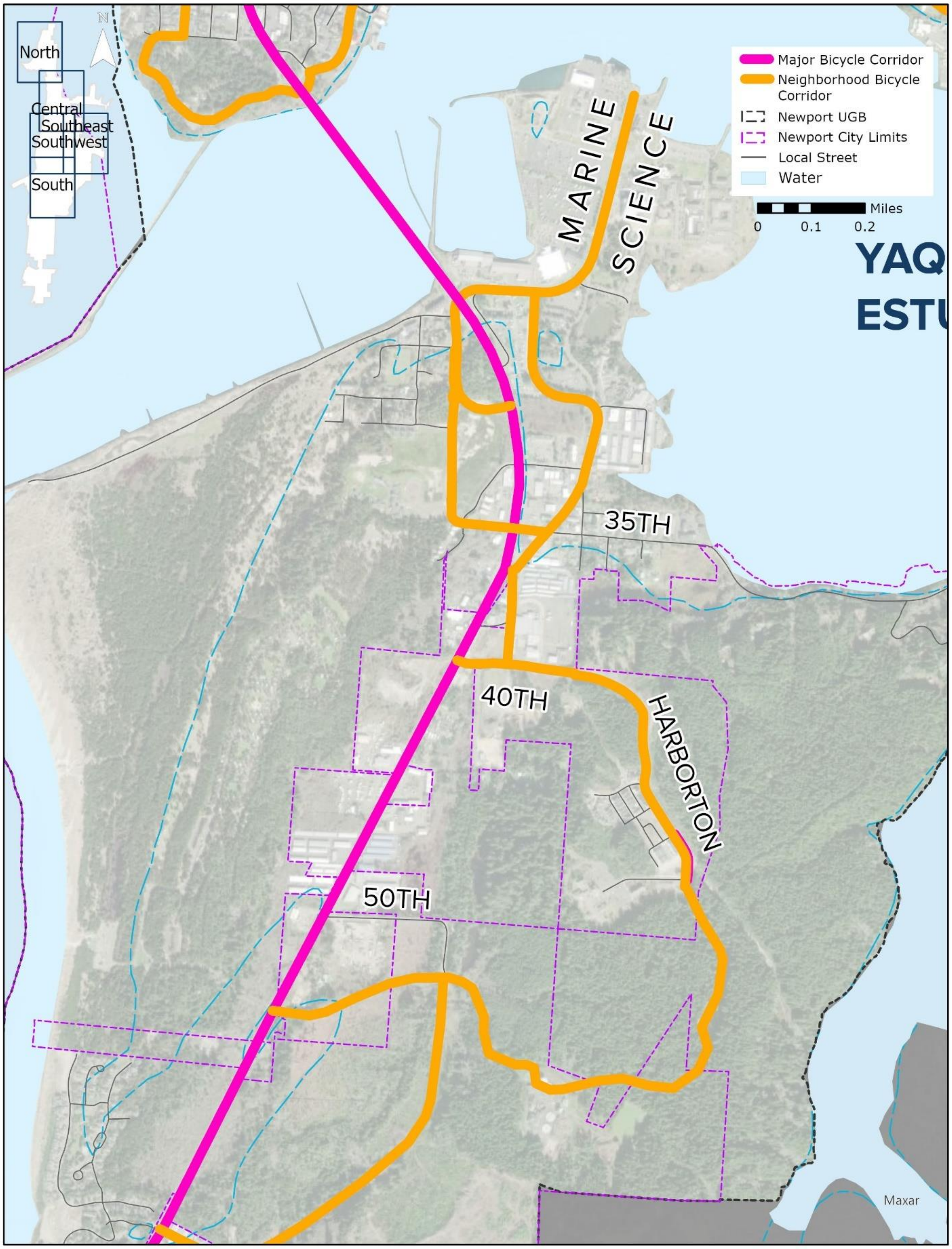


FIGURE 4E: NEWPORT'S PROPOSED BICYCLE CORRIDORS – SOUTH BEACH



MULTIMODAL NETWORK DESIGN

The recommended design of the streets in Newport is based on the functional classifications for motor vehicles. The recommended designs are intended to be implemented in newly developing or redeveloping areas of the city, where constrained conditions do not limit the ability to construct the typical cross-section described in the following sections. The construction or reconstruction of some streets may be constrained by challenging topography or environmentally sensitive, historic, or developed areas, and various minimum design parameters are outlined for these locations. Even unconstrained locations may be candidate locations to apply the minimum design parameters if they function as low-volume local streets (i.e., fewer than 500 vehicles per day).

Roadway cross-section design elements include travel lanes, curbs, planter strips, sidewalks on both sides of the road, and bicycle facilities. The following sections detail both preferred (for application in unconstrained locations) and minimum element widths (for application in constrained locations or for low-volume local streets) for each of Newport's functional classifications along with guidance for identifying an acceptable street cross-section in constrained locations. Acceptable street cross-sections are derived from the preferred cross-section standard based on the street's pedestrian and bicycle corridor classification. Preferred element widths should be implemented in most locations; minimum element widths require a documented constraint (e.g., topography, environmental, existing buildings) and approval by the City Engineer and Planning Director. The minimum element widths were expanded to allow flexibility in the width of specific elements depending on the multimodal corridors detailed above. The existing minimum right-of-way width and roadway width for the City of Newport are outlined in the Municipal Code (13.05.015).

Although this technical memo provides guidance for the preferred facilities on Arterial streets, both US 101 and US 20 are under the state's jurisdiction and are subject to the design criteria in the Highway Design Manual (HDM),[6] other ODOT manuals, and the companion document, the Blueprint for Urban Design (BUD).[7] The BUD supplements existing design manuals and provides enhanced design guidance until a full design manual update can be completed. The recommended guidance is consistent with the BUD, and the recommended urban contexts for US 101 and US 20 in Newport are provided in the appendix.

TRAVEL LANES AND PARKING

The vehicle classifications and freight corridors determine the design parameters for travel lanes of each street. This is the throughway for drivers, including cars, buses, and trucks. Table 2 provides the recommended travel lane and on-street parking requirements. The vehicle functional classification of the street is the starting point to determine the number of through lanes, lane

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[6] ODOT. *Highway Design Manual.* https://www.oregon.gov/odot/Engineering/Pages/Hwy-Design-Manual.aspx. 2012.

[7] ODOT. *Blueprint for Urban Design.* https://www.oregon.gov/odot/Engineering/Documents_RoadwayEng/Blueprint-for-Urban-Design_v1.pdf. 2020.

widths, and median and left-turn lane requirements. However, freight corridors takes precedence when determining the appropriate lane width regardless of the functional classification. Streets identified as part of Newport's truck network may include travel lanes up to 12 feet wide although 11 feet travel lanes are also acceptable. Wider lanes (over 12 feet) should only be used for short distances at intersections, where needed. Streets that require a median/ center turn lane should include a minimum 6-foot-wide pedestrian refuge at marked crossings. Otherwise, the median can be reduced to a minimum of 4 feet at midblock locations, before widening at intersections for left-turn lanes (where required or needed).

Select low-volume Local Streets (i.e., fewer than 500 vehicles per day) are also candidates for a Shared Streets treatment where all roadway users share a single, unmarked travel lane that is narrower than a traditional Local Street. Shared Streets require vehicle traffic to yield to pedestrians and bicyclists within the roadway which is reinforced by the narrow pavement width. The design of these streets is similar to many of Newport's existing, low-volume streets. Shared Streets are intended as an alternative to Local Street design where widening is not feasible, and this treatment supersedes the requirements of the Oregon Fire Code by authority granted to the City under ORS 368.039.

TABLE 2: RECOMMENDED TRAVEL LANE AND ON-STREET PARKING REQUIREMENTS					
ROADWAY CLASSIFICATION	ARTERIAL STREET[1]	MAJOR COLLECTOR STREET	NEIGHBORHOOD COLLECTOR STREET	LOCAL STREET	SHARED STREET[2]
TYPICAL THROUGH LANES (BOTH DIRECTIONS)	2 to 4	2	2	2	1
MINIMUM LANE WIDTH	11-12 ft.[3]	10 ft.[4]	10 ft.[4]	10 ft.	16 ft.
MEDIAN/ CENTER TURN LANE [5]	Optional 11-14 ft. median/ center turn lane[6]	Optional 11 ft. center turn lane [7]	None	None	None
MINIMUM ON-STREET PARKING WIDTH	Context dependent, 7-8 ft. where applicable	Optional 8 ft. preferred, 7 ft. allowed in residential areas[8]	Optional 8 ft. preferred, 7 ft. allowed in residential areas [8]	Optional 8 ft. preferred, 7 ft. allowed in residential areas [8]	None

Notes:

1. Although guidance is provided for Arterial streets, these are under state jurisdiction. Values presented in this table are consistent with the Blueprint for Urban Design (BUD). For detailed design recommendations on US 101 and US 20, the identified urban contexts for Newport are provided in the appendix and the BUD is publicly available.
2. Shared Street conditions may apply to local streets that carry fewer than 500 vehicles per day.
3. 11 ft. travel lanes are preferred for most urban contexts within Newport. 11 ft. travel lanes are standard for central business district areas in the BUD. Adjustments may be required for freight reduction review routes. Final lane width recommendations are subject to review and approval by ODOT.
4. Travel lanes up to 12 ft. may be permitted for designated local truck routes only.
5. A minimum 6-foot-wide pedestrian refuge should be provided at marked crossings. Otherwise, a median can be reduced to a minimum of 4 feet at midblock locations, before widening at intersections for left-turn lanes (where required or needed).
6. The BUD recommends a 14 ft. lane for speeds above 40 mph. Final lane width recommendations are subject to review and approval by ODOT.
7. Center left-turn lane required at intersections with Arterials; minimum 6-foot-wide median required where refuge is needed for pedestrian/bicycle street crossings.
8. 8 feet width required in commercial areas and 7 feet width allowed in residential areas. Provision of on-street parking (one-side only) should be limited to City streets (not on a designated freight route) with a minimum 28 ft. paved width in commercial areas or a minimum 27 ft. in residential areas. Provision of on-street parking (both sides) should be limited to City streets (not on a designated freight route) with a minimum 36 ft. paved width in commercial areas or a minimum 34 ft. in residential areas. For designated freight routes, on-street parking may only be provided with an additional 4 ft. paved width. On-street parking may be eliminated on one or both sides if adequate parking is provided off-street or to accommodate bicycle/pedestrian facilities.

NEIGHBORHOOD TRAFFIC MANAGEMENT TOOLS

Neighborhood Traffic Management (NTM) describes strategies that can be deployed to slow traffic, and potentially reduce volumes, creating a more inviting environment for pedestrians and bicyclists. NTM strategies are primarily traffic calming techniques for improving neighborhood livability on local streets. These strategies are most appropriate on Local Streets and Neighborhood Collectors, although a limited set of strategies can also be applied to Major Collectors and Arterials in special cases. NTM strategies on Arterial roadways requires review and approval by ODOT. 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. Examples of tools are shown in Figure 5.

FIGURE 5: SUMMARY OF NEIGHBORHOOD TRAFFIC MANAGEMENT STRATEGIES

Chicanes

www.pedbikeimages.org/Dan Burden

Chokers

www.pedbikeimages.org/Dan Burden

Curb Extensions

www.pedbikeimages.org/Carl Sundstrom

Diverters

www.pedbikeimages.org/Adam Fukushima

Median Islands

www.pedbikeimages.org/Dan Burden

Raised Crosswalks

www.pedbikeimages.org/Tom Harned

Speed Cushions

NACTO Urban Street Design Guide

Speed Hump

www.pedbikeimages.org/Dan Burden

Traffic Circles

www.pedbikeimages.org/Carl Sundstrom

Table 3, below, lists common NTM applications. Any NTM project should include coordination with emergency response staff to ensure that public safety is not compromised. NTM strategies implemented on a state facility would require coordination with ODOT regarding freight mobility considerations.

TABLE 3: APPLICATION OF NTM STRATEGIES

APPLICATION	USE BY FUNCTIONAL CLASSIFICATION				IMPACT	
	ARTERIALS *	MAJOR COLLECTORS	NEIGHBORHOOD COLLECTORS	LOCAL STREETS	SPEED REDUCTION	TRAFFIC DIVERSION
CHICANES				✓	✓	✓
CHOKERS				✓	✓	✓
CURB EXTENSIONS	✓	✓	✓	✓	✓	
DIVERTERS (WITH EMERGENCY VEHICLE PASS-THROUGH)		✓	✓	✓		✓
MEDIAN ISLANDS	✓	✓	✓	✓	✓	
RAISED CROSSWALKS			✓	✓	✓	✓
SPEED CUSHIONS (WITH EMERGENCY VEHICLE PASS-THROUGH)			✓	✓	✓	✓
SPEED HUMP			✓	✓	✓	✓
TRAFFIC CIRCLES			✓	✓	✓	✓

*Traffic calming strategies on Arterials require review and approval by ODOT

SIDEWALKS

Sidewalks provide for pedestrian movement and access, enhance pedestrian connectivity, and promote walking. The recommended pedestrian facilities in Newport intend to encourage walking by making it more attractive. Vehicle functional classification determine the appropriate pedestrian facilities along streets, including the width of the throughway for pedestrians and the buffer from the vehicle travel way. Sidewalk may be provided on one side of the street only where significant topographical constraints exist as determined by the City Engineer and Planning Director. The sidewalk encompasses four zones, including the frontage, pedestrian throughway, furnishings/landscape, and the buffer (i.e., on-street parking or bike facilities). The recommended configuration for each of these zones is provided in Table 4.

FIGURE 6: SIDEWALK ZONES

- The **frontage** describes the section where a pedestrian interacts with the adjacent buildings or private property and includes entryways and outdoor seating. This zone is typically between 1 and 3 feet wide for Major Pedestrian streets and ½ foot for other streets. It may include a concrete or natural surface depending on the adjacent land use.

- The **pedestrian throughway** is the accessible zone in which pedestrians travel. It includes a minimum eight-foot-wide clear throughway along Major Pedestrian, a minimum six-foot-wide clear throughway for Neighborhood Pedestrian streets, and five-feet wide clear throughway along Local Pedestrian streets.

- The **furnishings/ landscape** zone is the sidewalk section located between the pedestrian throughway and the curb, and includes street furnishings or landscaping (e.g., benches, lighting, bicycle parking, tree wells, and/or plantings). If adjacent to on-street parking, it should also include a clearance distance between any curbside parking and the street furnishing area or landscape strip (i.e., so vehicles parking, or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches, into the furnishings/landscape strip. It should include a minimum width of four feet.

- The **buffer** is the space between the pedestrian throughway and the vehicle travel way, and may consist of bike facilities, on-street parking, curb extensions, or other elements. This is also the location where users will access transit. It should include a minimum width between four and 12 feet, depending on the pedestrian classification, and encompasses the width of on-street parking, bike facilities, and furnishings/landscape zone.

TABLE 4: PREFERRED SIDEWALK CONFIGURATION

FUNCTIONAL CLASSIFICATION	ARTERIAL OR MAJOR COLLECTOR		NEIGHBORHOOD COLLECTOR	LOCAL STREET[1]
	COMMERCIAL	RESIDENTIAL		
PREFERRED CONFIGURATION				
FRONTAGE	3 ft. (City) 1-4 ft. (ODOT)	1 ft. (City) 1 ft. (ODOT)	0.5 ft.	0.5 ft.
PEDESTRIAN THROUGHWAY	8 ft. (City) 8-10 ft. (ODOT)	8 ft. (City) 8 ft. (ODOT)	6 ft.	5 ft.
FURNISHINGS/ LANDSCAPE (INCLUDES CURB)[2]	4 ft. (City) 5.5-6.5 ft. (ODOT)	4 ft. (City) 6.5 ft. (ODOT)	4 ft.	4 ft.
DESIRED WALKWAY WIDTH	15 ft. (City) Variable (ODOT)[4]	13 ft. (City) Variable (ODOT)[4]	10.5 ft.	9.5 ft.
DESIRED BUFFER (PEDESTRIAN THROUGHWAY TO VEHICLE TRAVEL WAY)[3]	12 ft. (City) Variable (ODOT)[4]	12 ft. (City) Variable (ODOT)[4]	4 ft.	4 ft.

Notes:

1. Shared Streets do not require sidewalk
2. Furnishings/landscape width may be reduced to the “acceptable” standard if bike facilities or on-street parking is included within the buffer zone
3. Includes width of on-street parking, bike facilities, and furnishings/landscape zone, if provided
4. Desired walkway and buffer width for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in the BUD.

The construction or reconstruction of some streets may be constrained by challenging topography or environmentally sensitive, historic, or developed areas. These roadways may require modified designs to allow for reasonable construction costs. Guidance for modifications to the standard sidewalk designs is provided in Table 5. The preferred sidewalk element widths, documented in Table 4, should be implemented in most locations; minimum element widths, summarized in Table 5, require a documented constraint (e.g., topography, environmental, existing buildings) and approval by the City Engineer and Planning Director. Any modification of a standard sidewalk design requires justification of any constraints (e.g., topography, environmental, existing buildings) and approval of an acceptable deviation prior to construction. Sidewalk facilities constructed on state facilities are subject to review and approval by ODOT based on guidance from the BUD.

TABLE 5: ACCEPTABLE SIDEWALK CONFIGURATION				
FUNCTIONAL CLASSIFICATION	**ARTERIAL OR MAJOR COLLECTOR**		**NEIGHBORHOOD COLLECTOR**	**LOCAL STREET[1]**
	COMMERCIAL	**RESIDENTIAL**		
ACCEPTABLE CONFIGURATION				
FRONTAGE	0.5 ft. (City) 1-2 ft. (ODOT)	0.5 ft. (City) 1 ft. ODOT	0.5 ft.	0.5 ft.
PEDESTRIAN THROUGHWAY	8 ft. (City)[3] 5-8 ft. (ODOT)	6 ft. (City) 5 ft. (ODOT)	6 ft.	5 ft.
FURNISHINGS/ LANDSCAPE (INCLUDES CURB)	3 ft. (City) 0.5 ft. (ODOT)	3 ft. (City) 0.5 ft. (ODOT)	0.5 ft.	0.5 ft.
MINIMUM WALKWAY WIDTH	11.5 ft. (City) Variable (ODOT)[4]	9.5 ft. (City) Variable (ODOT)[4]	7 ft.	6 ft.
RECOMMENDED MINIMUM BUFFER (PEDESTRIAN THROUGHWAY TO VEHICLE TRAVEL WAY)[2]	3 ft. (City) Variable (ODOT)[4]	3 ft. (City) Variable (ODOT)[4]	0.5 ft.	0.5 ft.

Notes:

1. Shared Streets do not require sidewalk
2. Includes width of on-street parking, bike facilities, and furnishings/landscape zone
3. In highly constrained locations, the landscape buffer may be eliminated to meet the required 8 ft. pedestrian throughway with approval from the City Engineer and Planning Director
4. Desired walkway and buffer width for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in the BUD.

BICYCLE FACILITIES

Bike facilities help support the movement of people riding bikes. Streets should be safe and comfortable for bicyclists of all ages and abilities to encourage ridership. Building high quality bicycle infrastructure can improve transportation safety, minimize public health risks, reduce congestion, and provide more equitable access to transportation. The preferred and acceptable bicycle facilities can be seen in Table 6. Vehicle function classification is used to determine the appropriate facilities along streets. The preferred treatments are recommended to include protected or separated facilities from the vehicle travel way along Arterial and Major Collector streets and bicycle lanes along Neighborhood Collector streets. A shared street environment will be provided on Newport's Local Streets.

The construction or reconstruction of some streets may be constrained by challenging topography or environmentally sensitive, historic, or developed areas. These roadways may require modified designs to allow for reasonable construction costs. Guidance for modifications to the preferred bike facility is provided in Table 6. Any modification of a standard bike facility requires justification of any constraints (e.g., topography, environmental, existing buildings) and approval of an acceptable deviation prior to construction.

TABLE 6: PREFERRED AND ACCEPTABLE BICYCLE FACILITIES

VEHICLE CLASSIFICATION	ARTERIAL OR MAJOR COLLECTOR	NEIGHBORHOOD COLLECTOR	LOCAL STREET
PREFERRED BIKE FACILITY (UNCONSTRAINED CONDITIONS)	Protected or separated facilities from the vehicle travel way (e.g., shared use path, separated bicycle lanes)	Bicycle lanes	Shared streets without shared lane markings
ACCEPTABLE BIKE FACILITY (CONSTRAINED CONDITIONS)[1]	Bicycle lanes	Shared streets with shared lane markings	Shared streets without shared lane markings

Notes:

1. Any modification of a standard bike facility requires justification of any constraints (e.g., topography, environmental, existing buildings) and approval of an acceptable deviation prior to construction.

BICYCLE FACILITY OPTIONS

Table 7 shows bicycle facility options and recommended configurations. In general, facilities that are protected or separated from the vehicle travel way include a 10-foot two-way or 6-foot one-way cycle track, 10-foot shared use path, or 8-foot buffered bike lanes. Non-buffered bike lanes should be a minimum of 6-feet wide, while some shared streets should include shared lane markings, with vehicle speed and volume management. The preferred bicycle facility types, documented in Table 6, should be implemented in most locations while implementation of an acceptable bicycle facility requires a documented constraint (e.g., topography, environmental, existing buildings) and approval by the City Engineer and Planning Director. Bicycle facilities constructed on state facilities are subject to review and approval by ODOT based on guidance from the BUD.

TABLE 7: BICYCLE FACILITY OPTIONS AND RECOMMENDED CONFIGURATIONS		
BICYCLE FACILITY TYPE	**RECOMMENDED CONFIGURATION**	**RECOMMENDED DESIGN PARAMETERS**
TWO-WAY CYCLE TRACK (PROTECTED/ SEPARATED FACILITY)[1]		Option: At sidewalk grade
		Minimum width: 12 ft.
		Minimum buffer: Up to 6 ft. from vehicle travel way; consider a buffer or other delineation to separate bicycle facility from sidewalk
		Option: At roadway grade
		Minimum width: 12 ft.
		Minimum buffer: Up to 6 ft. from vehicle travel way; 0 ft. from sidewalk
ONE-WAY CYCLE TRACK (PROTECTED/ SEPARATED FACILITY)[1]		Option: At sidewalk grade
		Minimum width: 8 ft.
		Minimum buffer: Up to 6 ft. from vehicle travel way; consider a buffer or other delineation to separate bicycle facility from sidewalk
		Option: At roadway grade
		Minimum width: 8 ft.
		Minimum buffer: Up to 6 ft. from vehicle travel way; 0 ft. from sidewalk
SHARED USE PATH (PROTECTED/ SEPARATED FACILITY)[1]		Minimum width: 12 ft.
		Minimum shoulder: 2 ft. on each side
		Minimum buffer: Up to 6 ft. from vehicle travel way
BUFFERED BIKE LANES (PROTECTED FACILITY)[1]		Minimum width: 8 ft. (5 ft. bike lane with 3 ft. buffer)

TABLE 7: BICYCLE FACILITY OPTIONS AND RECOMMENDED CONFIGURATIONS		
BICYCLE FACILITY TYPE	**RECOMMENDED CONFIGURATION**	**RECOMMENDED DESIGN PARAMETERS**
BIKE LANES[1]		Minimum width: 6 ft.
SHARED STREET		Optional treatments: Shared lane markings, vehicle speed and volume management

Notes:

1. Desired bicycle facility and buffer width for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in the BUD.

PREFERRED STREET CROSS-SECTIONS FOR CITY STREETS

To determine the typical cross-section for a street implemented in newly developing or redeveloping areas of the city, the motor vehicle functional classification is used to determine the design requirements for each mode. In unconstrained conditions, the preferred facility design requirements should be met for all modes (see Tables 2, 4, 6, and 7 earlier in this document). The recommended preferred cross-sections for Major Collectors, Neighborhood Collectors, and Local Streets in unconstrained conditions are provided below in Figures 7, 8, and 9/9B, respectively. The preferred Local Street cross-sections include options for parking on one side of the street only and no on-street parking. The provision of parking on one side of the street only should be determined based on the availability of off-street parking as determined by the City Engineer and Planning Director. All typical cross-sections provided below assume that the street is not located on a designated local freight route. Local freight routes may require travel lanes up to 12 ft. although 11 ft. travel lanes are also acceptable.

No typical cross-sections are provided for Arterials in Newport since these streets are subject to review and approval by ODOT. Design guidance from ODOT can be found in the BUD and is summarized in Tables 2, 4, 6, and 7 earlier in this document. ODOT's design guidance is context dependent which provides flexibility in specific element widths when determining typical cross-sections.

FIGURE 7: PREFERRED MAJOR COLLECTOR TYPICAL CROSS-SECTION (SOURCE: STREETMIX)

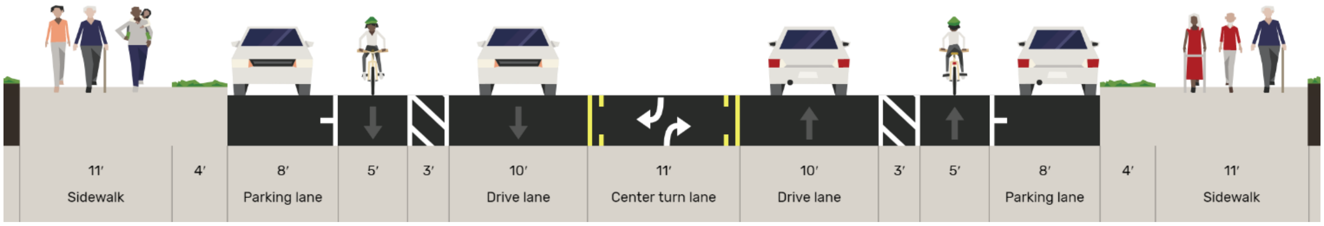


FIGURE 8: PREFERRED NEIGHBORHOOD COLLECTOR TYPICAL CROSS-SECTION (SOURCE: STREETMIX)

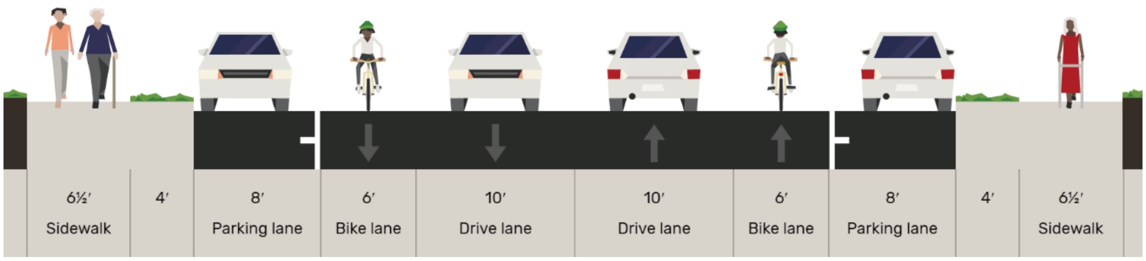


FIGURE 9A: PREFERRED LOCAL STREET TYPICAL CROSS-SECTION – PARKING ONE SIDE ONLY (SOURCE: STREETMIX)

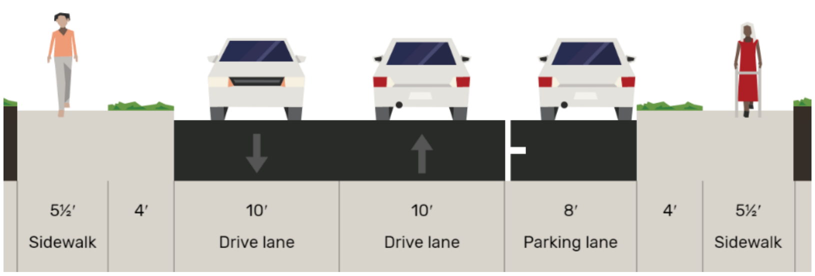
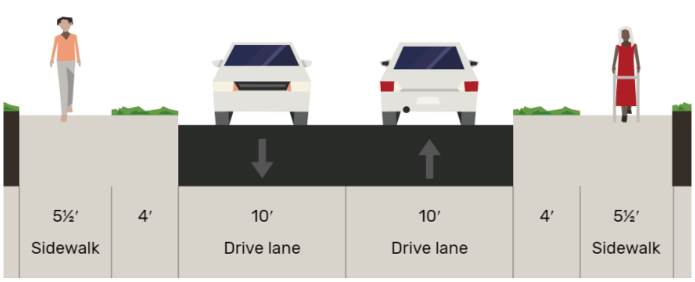


FIGURE 9B: PREFERRED LOCAL STREET TYPICAL CROSS-SECTION – NO PARKING (SOURCE: STREETMIX)



ACCEPTABLE STREET CROSS-SECTIONS FOR CITY STREETS

The preferred designs recommended in the previous section (Preferred Street Cross-Sections for City Streets) are intended to be implemented in newly developing or redeveloping areas of the city (e.g., areas where two or more adjacent parcels redevelop concurrently, subdivisions constructed on existing parcels), where constrained conditions do not limit the ability to construct the typical cross-section. The construction or reconstruction of some streets may be constrained by challenging topography or environmentally sensitive, historic, or developed areas, and various acceptable design parameters are provided for these locations. Constrained conditions may apply when the required width of the street cross-section (i.e., the sum of the recommended widths of travel lanes, on-street parking, pedestrian, and bicycle facilities) exceeds the available right-of-way.

If the required cross-section is wider than the available right-of-way, coordination with the City of Newport is required to determine whether right-of-way acquisition is necessary or design elements can be narrowed or removed. For locations with constrained right-of-way, guidance for determining an acceptable street cross-section is summarized in Table 7 and typical constrained cross-sections are summarized below in Figures 10, 11, and 12A/12B/12C. The steps outlined in Table 8 provide guidance on the order in which cross-section elements should be reduced to acceptable minimum standards based on the designated pedestrian or bicycle corridors. Any modifications to the preferred street cross-section will require findings that the proposal meets defined constraints (e.g., topography, environmental, existing buildings) and approval of an acceptable deviation from the City Engineer and Planning Director prior to construction. Constrained conditions on ODOT facilities will require review and approval by ODOT

TABLE 8: PROCESS FOR DETERMINING STREET CROSS-SECTIONS IN CONSTRAINED CONDITIONS				
ANY NON-ARTERIAL[1] STREET FUNCTIONAL CLASSIFICATION WITH:	**STEPS TO REDUCE LOWER PRIORITY STREET COMPONENTS[5]**			
	STEP 1	**STEP 2**	**STEP 3**	**STEP 4**
EQUAL PEDESTRIAN AND BICYCLE CORRIDORS[2]	Eliminate on-street parking on one or both sides	Reduce sidewalk frontage zone to acceptable width	Choose acceptable bike facility	Reduce the furnishings/ landscape zone or pedestrian throughway to acceptable width
HIGHER PEDESTRIAN VS. BICYCLE CORRIDORS [3]		Implement acceptable bike facility	Reduce sidewalk frontage zone to acceptable width	
HIGHER BICYCLE VS. PEDESTRIAN CORRIDORS[4]		Reduce sidewalk frontage zone to acceptable width	Reduce the furnishings/ landscape zone or pedestrian throughway to acceptable width	Implement acceptable bike facility

Notes:

1. The street cross-section for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in the BUD.
2. Includes Major Pedestrian vs. Major Bicycle corridor, Neighborhood Pedestrian vs. Neighborhood Bicycle corridor, or Local Pedestrian vs. Local Bicycle corridor.
3. Includes Major Pedestrian vs. Neighborhood or Local Bicycle corridor, or Neighborhood Pedestrian vs. Local Bicycle corridor.
4. Includes Major Bicycle vs. Neighborhood or Local Pedestrian corridor, or Neighborhood Bicycle vs. Local Pedestrian corridor
5. Local Streets that carry less than 500 vehicles per day are candidates for shared street treatments in lieu of this process

FIGURE 10: ACCEPTABLE MAJOR COLLECTOR TYPICAL CROSS-SECTION (SOURCE: STREETMIX)

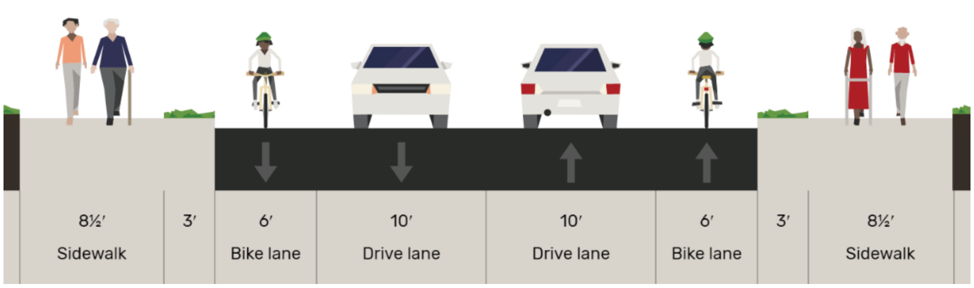


FIGURE 11: ACCEPTABLE NEIGHBORHOOD COLLECTOR TYPICAL CROSS-SECTION (SOURCE: STREETMIX)

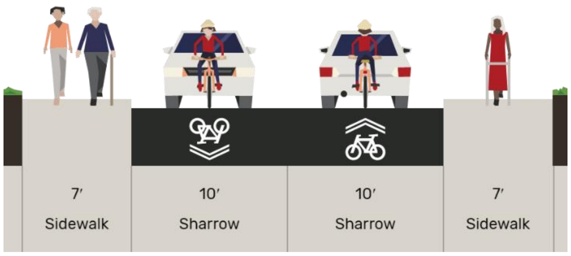


FIGURE 12A: ACCEPTABLE LOCAL STREET TYPICAL CROSS-SECTION – PARKING ONE SIDE ONLY (SOURCE: STREETMIX)

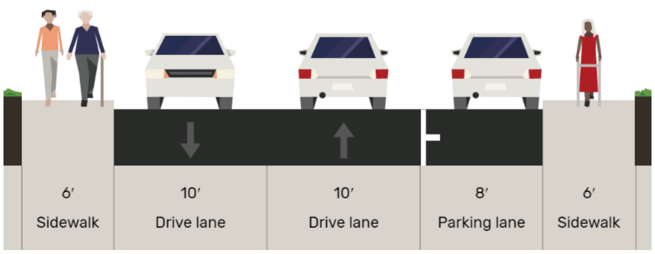


FIGURE 12B: ACCEPTABLE LOCAL STREET TYPICAL CROSS-SECTION – NO PARKING (SOURCE: STREETMIX)

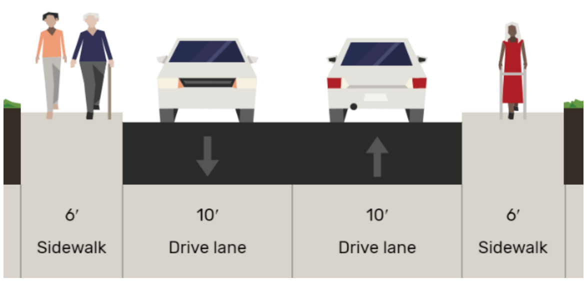
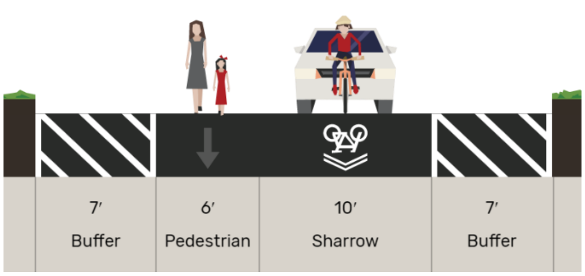


FIGURE 12C: ACCEPTABLE LOCAL STREET TYPICAL CROSS-SECTION – SHARED STREET (SOURCE: STREETMIX)



SEPARATED PEDESTRIAN AND BICYCLE FACILITIES

Some pedestrian and bicycle facilities may be separated from the right-of-way of a street. These facilities include pedestrian trails, pedestrian and bicycle accessways, and shared use paths. These facilities serve a variety of recreation and transportation needs for pedestrians and bicyclists.

PEDESTRIAN TRAIL

Pedestrian trails are typically located in parks or natural areas and provide opportunities for both pedestrian circulation and recreation. They are recommended to include a minimum width of 5 feet (see Table 9) and may include a hard or soft surface.

ACCESSWAY

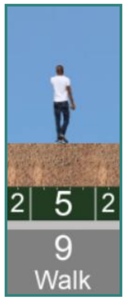
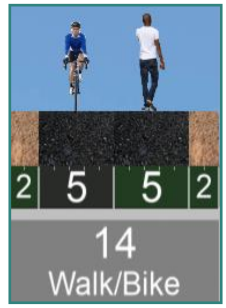
Accessways provide short path segments between disconnected streets or localized recreational walking and biking opportunities. Accessways must be on public easements or rights-of-way and have minimum paved surface of 8 feet, with a 2-foot shoulder on each side, and 12 feet of right-of-way. Accessways should be provided in any locations where the length between existing pedestrian and bicycle connections exceeds the maximum allowable length identified in Table 10.

SHARED USE PATH

Shared use paths provide off-roadway facilities for walking and biking travel. Depending on their location, they can serve both recreational and citywide circulation needs. Shared use path designs vary in surface types and widths. Hard surfaces are generally better for bicycle travel. Widths need to provide ample space for both walking and biking and should be able to accommodate maintenance vehicles.

A shared use path is recommended to be at least 10 feet wide, with a 2-foot shoulder on each side, and 14 feet of right-of-way (see Table 9). In areas with significant walking or biking demand (e.g., Nye Beach Area, Oregon Coast Bike Route) or on ODOT facilities, that path is recommended to be 12 feet wide, with a 2-foot shoulder on each side and a total right-of-way of 16 feet (see Table 9). A shared use path may be narrowed to 8 feet over short distances to address environmental or right-of-way constraints.

TABLE 9: SEPARATED PEDESTRIAN AND BICYCLE FACILITIES RECOMMENDED DESIGNS

FACILITY OPTIONS	PEDESTRIAN TRAIL DESIGN	ACCESSWAY DESIGN	TYPICAL SHARED USE PATH DESIGN	HIGH-DEMAND SHARED USE PATH DESIGN[1]
RECOMMENDED CONFIGURATION				

Notes:

1. **HIGH-DEMAND SHARED USE PATH IS REQUIRED PARALLEL TO ODOT FACILITIES AND IN OTHER AREAS WITH SIGNIFICANT WALKING OR BIKING DEMAND (E.G., NYE BEACH AREA, OREGON COAST BIKE ROUTE)**

STREET CROSSINGS

Streets with high traffic volumes and/or speeds in areas with trail crossings, or nearby transit stops, residential uses, schools, parks, shopping and employment destinations generally require enhanced street crossings with treatments, such as marked crosswalks, high visibility crossings, and curb extensions to improve the safety and convenience for pedestrians. Crossings should be consistent with the recommended transportation facility spacing standards shown in Table 10. Street crossings along US 101 or US 20 should be provided between every 250 to 1,500 feet, depending on the urban context, as summarized in Table 3-9 of the BUD. Exceptions include where the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use or other factors that may prevent safe crossing. All crossings on state facilities require review and approval by ODOT.

Enhanced pedestrian crossing treatments should be considered on high speed or high volume roads (*e.g.* US 101, US 20) at transit stops, trail crossings, and at Major Pedestrian street highway crossings that connect major destinations (*e.g.* parks, grocery stores, schools) to residential areas. The recommended enhanced pedestrian crossing treatment should be determined using the National Cooperative Highway Research Program (NCHRP) Report 562, Improving Pedestrian Safety at Unsignalized Intersections. These guidelines for pedestrian crossing treatments are based on vehicle speed on the major street, pedestrian crossing distance, peak hour pedestrian volume, peak hour vehicle volume, and local parameters such as motorist compliance, pedestrian walking speed, and pedestrian start-up and clearance time. NCHRP Report 562 includes worksheets for inputting the variables above and identifying the appropriate treatment type. It is recommended that these guidelines be reviewed with all traffic studies for any potential street crossing associated with new development in the city.

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

It is recommended that neighborhood traffic impacts be reviewed with all traffic studies associated with new development in the city. Any development that would be expected to increase through-trips on existing residential-adjacent Neighborhood Collector or Local Streets by 40 or more vehicles during the evening peak hour or 400 vehicles per day will require assessment and mitigation of residential street impacts. Through-trips are defined as those to and from a proposed development that have neither an origin nor a destination in the neighborhood. The study shall include all of the following:

- Existing number of through-trips per day on adjacent residential Local Streets or Neighborhood Collector streets.
- Projected number of through-trips per day on adjacent residential Local Streets or Neighborhood Collector streets that will be added by the proposed development.

A Neighborhood Collector or Local Street is considered impacted if volumes are increased above 1,500 average daily trips on Neighborhood Collector streets or 1,200 average daily trips on Local Streets. Volume and speed management tools must be provided to mitigate for the impacts of projected through-trips consistent with Table 3.

In addition, a formal neighborhood traffic management program is recommended to respond to neighborhood concerns outside of the development review process. The process should be initiated by a citizen filed request that includes petition signatures of impacted neighbors or business owners and include a preliminary evaluation on vehicle travel speeds or volumes along the petitioned street. If a problem were 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 to twelve months after implementation, the device should be reevaluated for effectiveness.

PERFORMANCE STANDARDS

Performance standards are applied to the operation and design of transportation facilities to ensure that the network functions as intended. In Newport, this includes performance standards for vehicles and overall system connectivity.

TRANSPORTATION FACILITY AND ACCESS SPACING STANDARDS

Transportation facility and access spacing standards include a broad set of techniques that balance the need to provide for efficient, safe, and timely multimodal travel with the ability to allow access to individual destinations. These standards help create a system of direct, continuous, and connected transportation facilities to minimize out-of-direction travel and decrease travel times for all users, while enhancing safety for people walking, biking and driving by reducing conflict points.

Currently, the city restricts driveways onto Arterial streets to spacing of 500 feet where practical,[8] and limits blocks to 1,000 feet in length between corners.[9] Table 10 identifies recommended maximum and minimum public roadway intersection, minimum private access, and maximum pedestrian and bicycle connection spacing standards for streets in Newport. New streets or redeveloping properties must comply with these standards to the extent practical, as determined by the city engineer. As the opportunity arises through redevelopment, streets or driveways not complying with these standards could improve with strategies such as shared access points, access restrictions (through the use of a median or channelization islands), or closure of unnecessary access points, as feasible.

All Arterial streets in Newport are under ODOT jurisdiction. See the Oregon Highway Plan and Blueprint for Urban Design for spacing standards along US 101 and US 20.

TABLE 10: TRANSPORTATION FACILITY AND ACCESS SPACING STANDARDS[1]

	ARTERIALS[4]	MAJOR COLLECTORS	NEIGHBORHOOD COLLECTORS	LOCAL STREETS
MAXIMUM BLOCK LENGTH (PUBLIC STREET TO PUBLIC STREET)		1,000 feet	1,000 feet	1,000 feet
MINIMUM BLOCK LENGTH (PUBLIC STREET TO PUBLIC STREET)		200 feet	150 feet	125 feet
MAXIMUM LENGTH BETWEEN PEDESTRIAN/BICYCLE CONNECTIONS (PUBLIC STREET TO PUBLIC STREET, PUBLIC STREET TO CONNECTION **OR** CONNECTION **TO** CONNECTION**)**[2]		300 feet	300 feet	300 feet
MINIMUM DRIVEWAY SPACING (DRIVEWAY TO DRIVEWAY)	350-1,320 feet	100 feet	75 feet	N/A
MINIMUM INTERSECTION SET BACK (FULL ACCESS DRIVEWAYS ONLY)[3]	350-1,320 feet	150 feet	75 feet	25 feet

[8] City of Newport Municipal Code 14.14.120

[9] City of Newport Municipal Code 13.05.020

TABLE 10: TRANSPORTATION FACILITY AND ACCESS SPACING STANDARDS[1]				
	ARTERIALS[4]	MAJOR COLLECTORS	NEIGHBORHOOD COLLECTORS	LOCAL STREETS
MINIMUM INTERSECTION SET BACK (RIGHT-IN/RIGHT-OUT DRIVEWAYS ONLY)[3]	350-1,320 feet	75 feet	50 feet	25 feet

Notes:

1. All distances measured from the edge of adjacent approaches.
2. Mid-block pedestrian and bicycle connections must be provided when the block length exceeds 300 feet to ensure convenient access for all users. Mid-block pedestrian and bicycle connections must be provided on a public easement or right-of-way every 300 feet, unless the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use or other factors that may prevent safe crossing. When the block length is less than 300 feet, mid-block pedestrian and bicycle connections are not required.
3. A property must construct access to a lower classified roadway, where possible
4. All Arterial streets in Newport are under ODOT jurisdiction. ODOT facilities are subject to access spacing guidelines in the Oregon Highway Plan (see Table 14 of Appendix C) and the Blueprint for Urban Design which vary based on posted speed and urban context

VEHICLE MOBILITY STANDARDS

Mobility standards for streets and intersections in Newport provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur. Two common methods currently used in Oregon to gauge traffic operations for motor vehicles are volume to capacity (v/c) ratios and level of service (LOS), described below. Vehicle miles travelled (VMT) is a new mobility standard that is currently being considered by Oregon, but there is currently no guidance or legislation for its implementation. VMT provides a more comprehensive look at transportation impacts by encouraging compact development that supports active transportation and transit over traditional vehicle mobility standards which can encourage developments on the periphery of urban areas. As part of the next TSP update, Newport should consider implementing a VMT mobility standard if additional guidance for implementation is provided by ODOT at that time.

- Volume-to-capacity (v/c) ratio: A v/c ratio is a decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. The ratio is the peak hour traffic volume divided by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. A ratio approaching 1.00 indicates increased congestion and reduced performance.
- Level of service (LOS): LOS is a “report card” rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay is excessive, and demand exceeds capacity, typically resulting in long queues and delays.

The City of Newport does not currently have adopted mobility standards for motor vehicles. It is recommended that the City of Newport consider adopting mobility standards to include both a v/c ratio and LOS standard. Having both a LOS (delay-based) and v/c (congestion-based) standard can be helpful in situations where one metric may not be enough, such as an all-way stop where one approach is over capacity but the overall intersection delay meets standards. The City of Newport should also introduce mobility standards that depend on the intersection control which can better capture acceptable levels of performance across different intersection control types. Table 11, below, summarizes recommended mobility targets.

TABLE 11: RECOMMENDED VEHICLE MOBILITY STANDARDS FOR LOCAL STREETS

INTERSECTION TYPE	PROPOSED MOBILITY STANDARD	REPORTING MEASURE
SIGNALIZED	LOS D and v/c ≤0.90	Intersection
ALL-WAY STOP OR ROUNDABOUTS	LOS D and v/c ≤0.90	Worst Approach
TWO-WAY STOP [1]	LOS E and v/c ≤0.95	Worst Major Approach/Worst Minor Approach

NOTES:

1. APPLIES TO APPROACHES THAT SERVE MORE THAN 20 VEHICLES; THERE IS NO STANDARD FOR APPROACHES SERVING LOWER VOLUMES.

For State facilities, mobility targets are v/c ratio based and listed in the OHP. Alternative mobility targets have previously been adopted on US 101 in South Beach. Table 12 lists the existing mobility targets for state facilities in Newport. Note that the need for alternative mobility targets will be evaluated and discussed in Technical Memorandum #11: Alternative Mobility Targets.

TABLE 12: EXISTING MOBILITY TARGETS FOR US 20 AND US 101

ROADWAY	EXTENTS	ADOPTED V/C MOBILITY TARGET	
		SIGNALIZED	UNSIGNALIZED[1]
US 101	North Urban Growth Boundary to NE 20th Street	≤ 0.80	≤ 0.80/0.90
US 101	NE 20th Street to SE 40th Street[2]	≤ 0.90 except US 101/SE 32nd St: ≤0.99	≤ 0.90/0.95

TABLE 12: EXISTING MOBILITY TARGETS FOR US 20 AND US 101			
ROADWAY	EXTENTS	ADOPTED V/C MOBILITY TARGET	
		SIGNALIZED	UNSIGNALIZED[1]
		US 101/SE 35th St: ≤0.99	
US 101	SE 40th Street to south Urban Growth Boundary[2]	≤ 0.80 except US 101/SE 40th St: ≤0.99 US 101/SE 50th St: ≤0.85 US 101/South Beach State Park Entrance: ≤0.85	≤ 0.80/0.90
US 20	Urban Growth Boundary to Moore Drive	≤ 0.80	≤ 0.80/0.90
US 20	Moore Drive to US 101	≤ 0.85	≤ 0.85/0.95

Notes:

1. For unsignalized intersections, the mobility target is listed for major approach/minor approach.
2. Alternative mobility targets have been adopted in South Beach.

[A] For unsignalized intersections, the mobility target is listed for major approach/minor approach.

[B] Alternative mobility targets have been adopted in South Beach.

LIFELINE ROUTES

Newport's location on the Oregon Coast makes it vulnerable to both earthquakes and tsunamis. Statewide planning efforts have previously identified seismic lifeline routes and tsunami evacuation routes within Newport. No additional emergency routes are recommended in the 2021 TSP.

The Oregon Seismic Lifeline Routes are a set of streets designated to facilitate emergency response and rapid economic recovery following a disaster. These routes include three tiers of streets, and higher tier routes are prioritized for seismic retrofits on the existing state-owned facilities.[10] Within Newport, US 101 (north of US 20) is a designated Tier 1 lifeline route. Both US 101 (south of US

[10] CH2MHill. *Seismic Lifelines Evaluation, Vulnerability Synthesis, and Identification*, 2012. https://www.oregon.gov/ODOT/Planning/Documents/Seismic-Lifelines-Evaluation-Vulnerability-Synthese-Identification.pdf

20) and US 20 are designated Tier 3 lifeline routes.[11] These routes are identified below in Figure 13.

While much of Newport is outside of the tsunami hazard area, the beach front, creek drainages, and the south beach area will need to evacuate in the event of a tsunami. The tsunami hazard areas and identified evacuation assembly areas are also identified below in Figure 13. Specific evacuation routes for each low-lying area are also available online.[12]

Ensuring the lifeline and evacuation routes serve their intended purpose both during and following a disaster will be critical to ensure public safety and facilitate recovery. Transportation projects which promote seismic resilience on lifeline routes, pedestrian or bicycle facilities on evacuation routes, or other wayfinding projects should be prioritized in the 2021 TSP.

---

[11] Figure 6-1. *Seismic Lifelines Evaluation, Vulnerability Synthesis, and Identification*, 2012. https://www.oregon.gov/ODOT/Planning/Documents/Seismic-Lifelines-Evaluation-Vulnerability-Synthese-Identification.pdf

[12] *Detailed, Neighborhood-Specific Tsunami Evacuation Routes.* https://www.oregongeology.org/tsuclearinghouse/pubs-evacbro_neighborhoods.htm

FIGURE 13A: LIFELINE ROUTES – AGATE BEACH

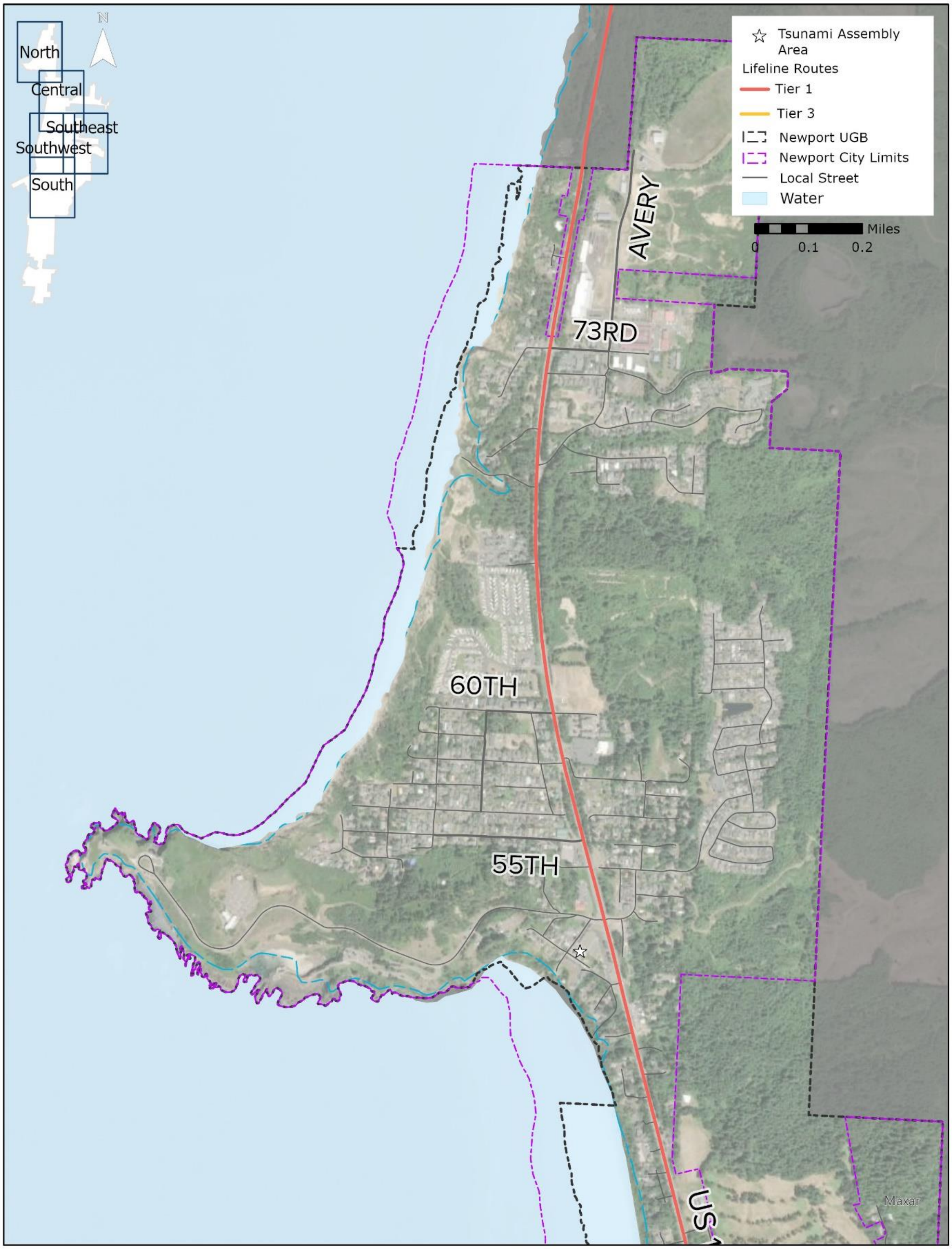


FIGURE 13B: LIFELINE ROUTES – NYE BEACH

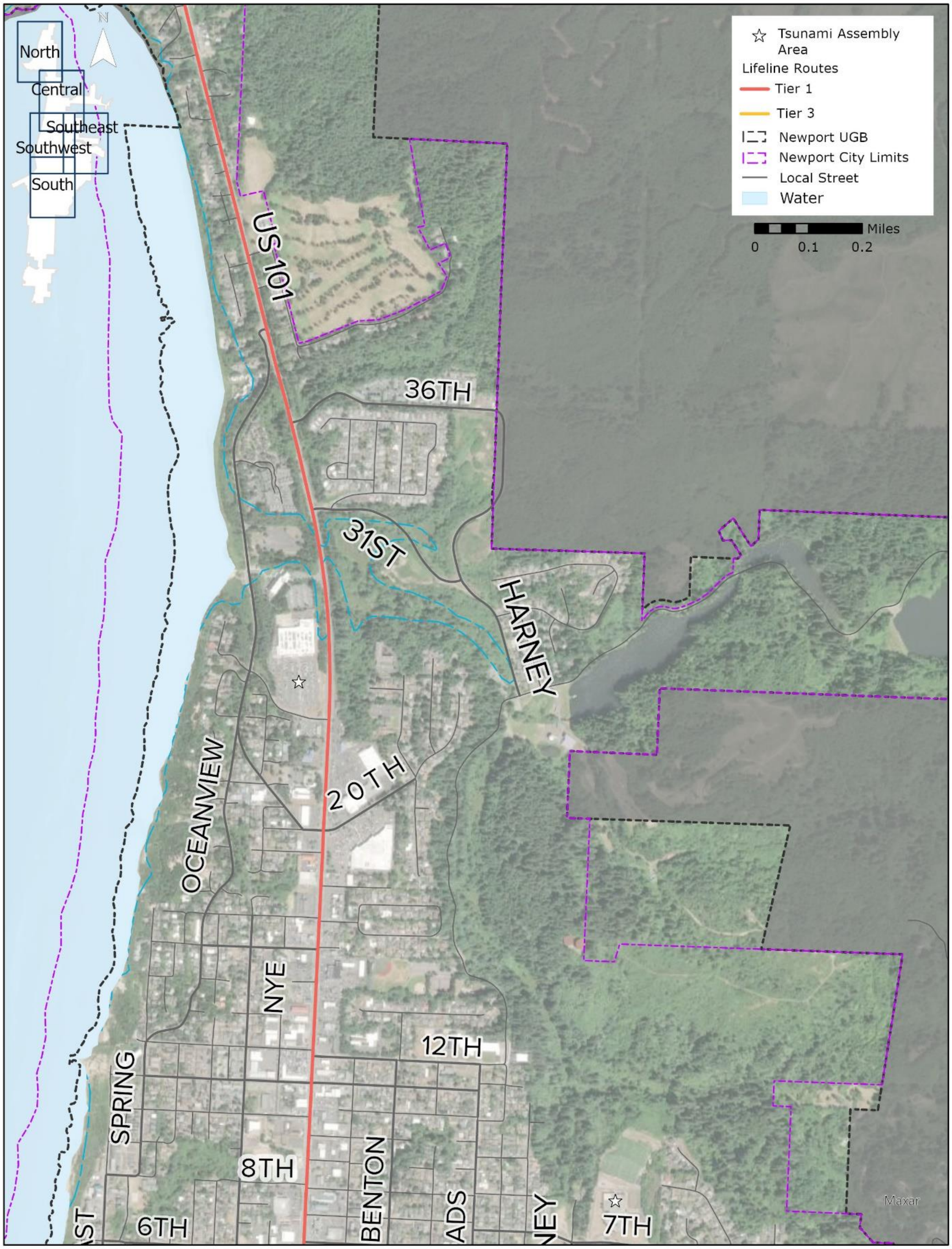


FIGURE 13C: LIFELINE ROUTES – DOWNTOWN

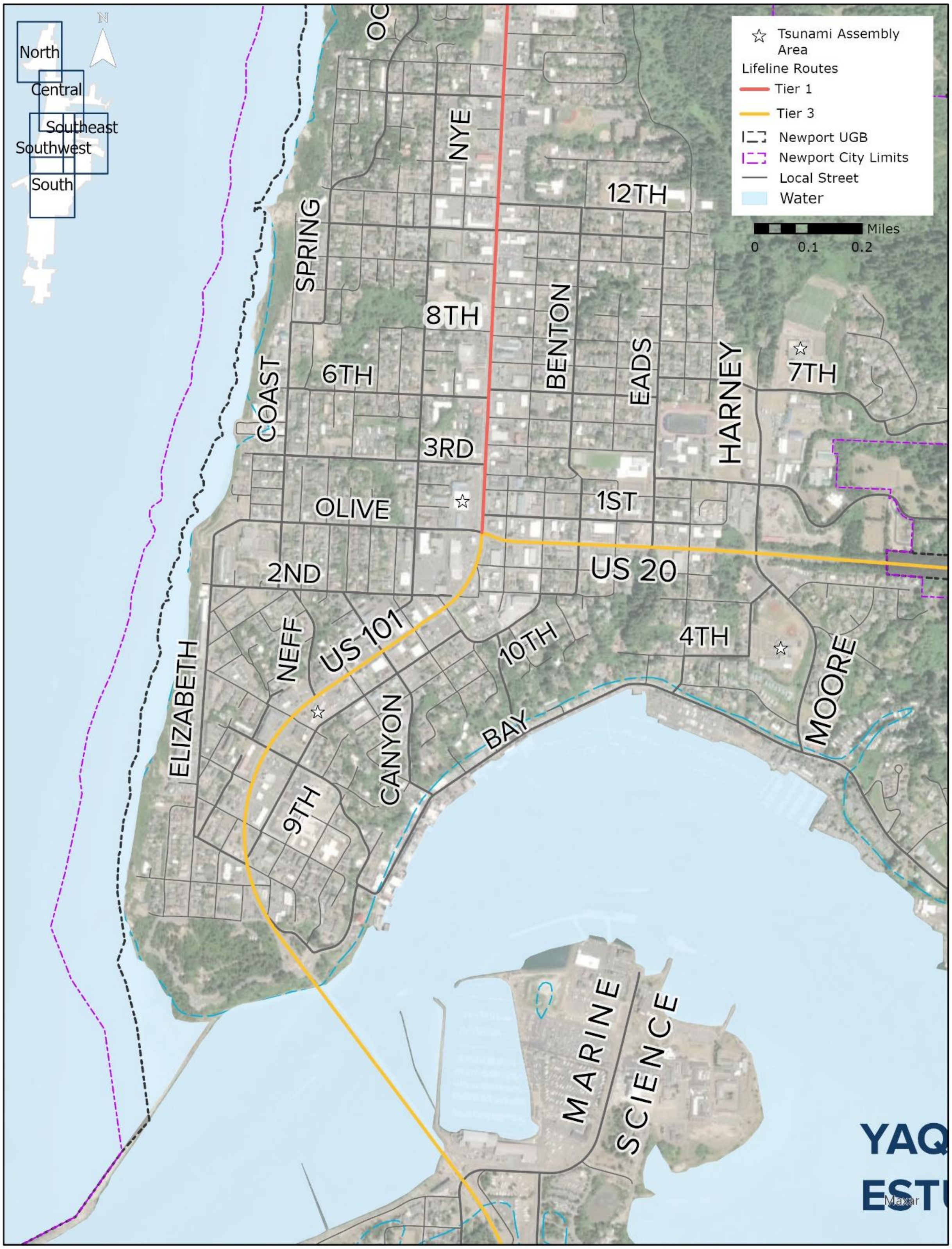


FIGURE 13D: LIFELINE ROUTES – EAST NEWPORT

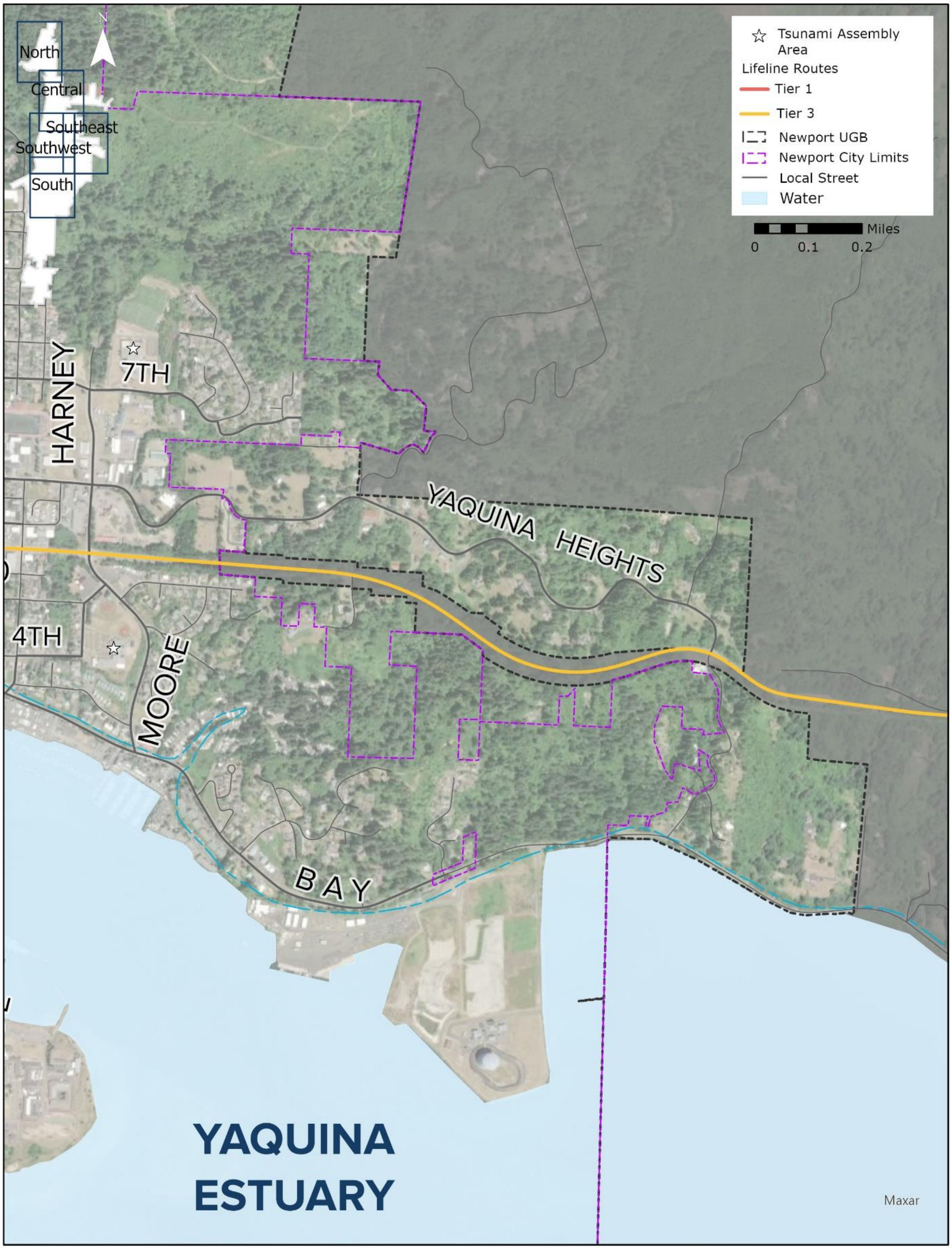
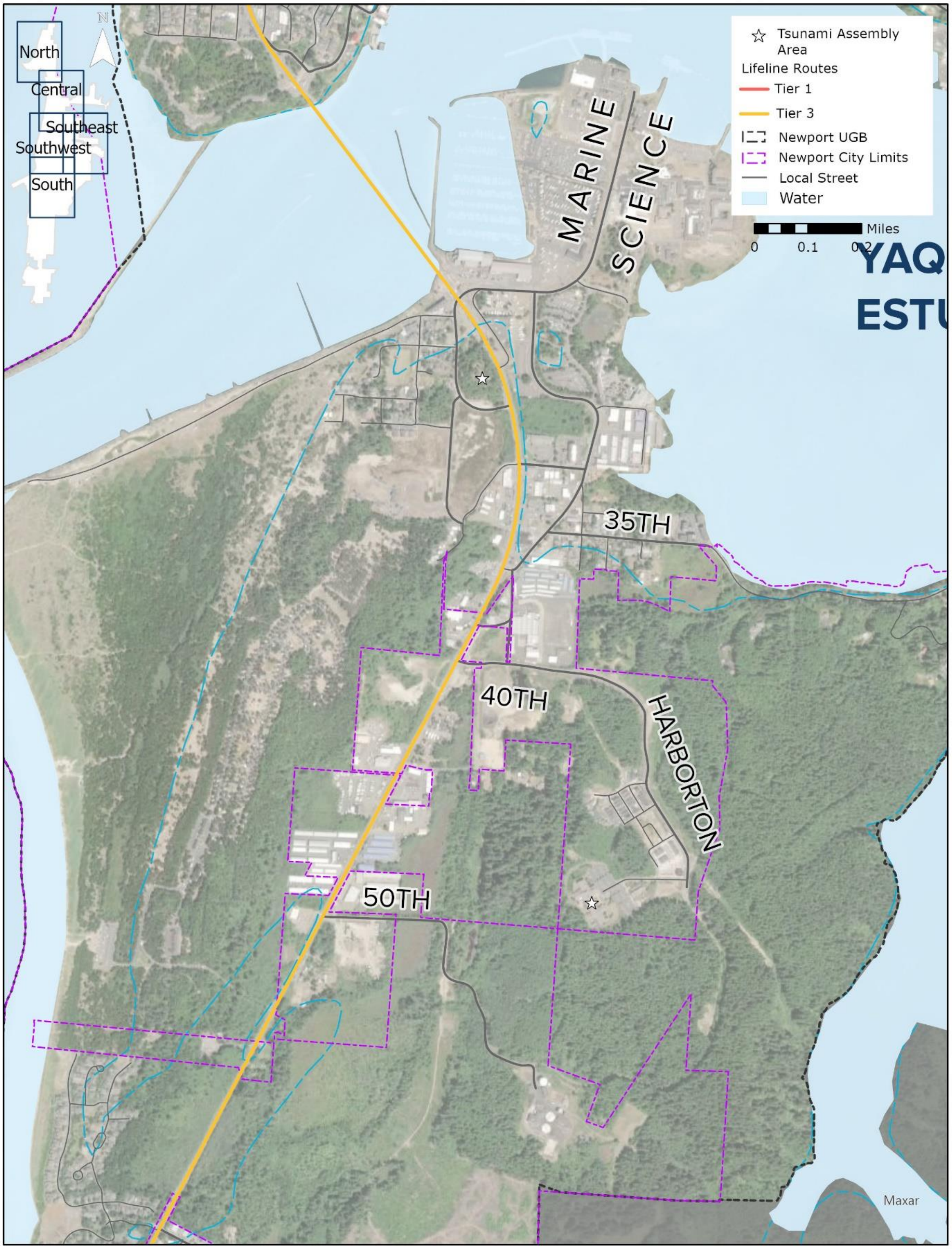


FIGURE 13E: LIFELINE ROUTES – SOUTH BEACH



STREET STORMWATER DRAINAGE MANAGEMENT

The City of Newport Municipal Code states that drainage facilities should be designed to consider the capacity and grade necessary to maintain unrestricted flow from areas draining from a new land division and to allow extension of the system to serve such areas.

Newport has neighborhoods with significant stormwater constraints, including Agate Beach, where landslide hazards and coastal erosion are common on the western edge of the neighborhood. As transportation improvements are constructed in Agate Beach, stormwater management will be critical to ensure that runoff from roadway improvements do not contribute to these existing hazards which could result in significant property damage. Potential management strategies could include requiring permeable pavement or bioswales which would hold stormwater prior to infiltration. These solutions could mitigate runoff which could impact the coastal bluffs in this neighborhood.

In addition to the coastal hazards, previous grading practices within the Agate Beach neighborhood could lead to excessive settlement for roadways and pathways due to the nature of the underlying soil. These settlement considerations could require flexible pavement or unimproved roadway/natural surface pathway standards which are more resilient to ground settlement.

Prior to construction of any transportation improvements within the Agate Beach neighborhood, a geotechnical and stormwater investigation will need to be completed to further detail any potential challenges or stormwater concerns for this area. A summary of the specific hazards facing Agate Beach is provided in the appendix.

[PLACE HOLDER FOR ADDITIONAL TEXT FROM THE CIVIL ENGINEERING SUB CONSULTANT]

ITS COORDINATION GUIDELINES

WHY ITS?

Intelligent Transportation Systems (ITS) involve the application of advanced technologies and proven management techniques to relieve congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. ITS focuses on increasing the efficiency of the existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g., travel lanes). Efficiency is achieved by providing services and information to travelers so that they can make better travel decisions and to transportation system operators so they can better manage the system. Quantifiable benefits from ITS include:

- Reduced vehicle delays
- Reduced crashes
- Improved air quality
- Reduced fuel consumption
- Improved travel times

This technology is supported by communications systems, which include wireless radio Bluetooth and Wi-Fi, microwave systems, and fiber optics. ITS and the supporting communication systems allow agencies to monitor and manage the transportation system remotely.

WHEN TO CONSIDER INTELLIGENT TRANSPORTATION SYSTEMS?

ITS solutions should be considered for a variety of reasons, but often depend on the context of a specific problem. The following list of situations are times to consider implementing ITS:

- To maximize the use of existing infrastructure and improve the efficient movement of vehicles before building more lanes
- To mitigate the impact of work zones, seasonal congestion, high crash locations, or adverse weather conditions
- To increase traveler information for road users to make informed decisions about their travel options including mode choice, travel time, and/or travel routing
- To increase the ability for agencies to monitor traffic conditions and make data-driven decisions remotely

General ITS strategies are summarized below in Table 13 while individual ITS components are summarized in Table 14.

TABLE 13: GENERAL ITS STRATEGIES		
CATEGORY	**TOOL**	**POTENTIAL APPLICATIONS TO CONSIDER FOR NEWPORT**
REGIONAL TRANSPORTATION MANAGEMENT	• Traffic Surveillance • Regional Traffic Management • Transportation Demand Management • Roadside Lighting • Railroad Grade Crossings	• Monitor traffic on US 101 and US 20 to respond to incidents
ARTERIAL MANAGEMENT	• Enhanced Traffic Signal Operations • Pedestrian and Bicycle Operations and Safety	• Implement enhanced signal operations to facilitate travel on US 101 during peak summer travel
INCIDENT AND EMERGENCY MANAGEMENT	• Regional Incident and Emergency Management • Emergency Vehicle Routing and Signal Preemption • Regional Alert System	• Implement signal preemption to facilitate travel to and from the hospital
TRAVELER INFORMATION	• Roadside Traveler Information Dissemination • Regional Traveler Information • Trip Planning and Routing • Parking Availability Information and Guidance	• Monitor and notify public of parking availability
REGIONAL OPERATIONS COORDINATION AND PLANNING	• Multi-Agency Operations Coordination and Planning	• Coordinate with ODOT for Yaquina Bay Bridge planning • Coordinate with Lincoln County Transit
PUBLIC TRANSPORTATION MANAGEMENT	• Advanced Transit Operations Management • Regional Transit Fare Integration • Transit Surveillance and Security • Multi-Modal Travel Coordination • Real-time Transit Information • Transit Signal Priority	• Coordinate with coastal transit agencies to support an integrated transit fare for travel on US 101
ROAD WEATHER OPERATIONS	• Road Weather Information Systems • Weather-Adaptive Traffic Management • Winter Roadway Maintenance	• Distribute information on US 20 conditions for regional travel

TABLE 13: GENERAL ITS STRATEGIES		
CATEGORY	**TOOL**	**POTENTIAL APPLICATIONS TO CONSIDER FOR NEWPORT**
MAINTENANCE AND CONSTRUCTION	• Maintenance and Construction Management • Work Zone Management	• Provide real time work zone management for major projects on US 101 and US 20
REGIONAL DATA ARCHIVING	• Regional Transportation Data Archive	○ Establish a local traffic count data archive
REGIONAL COMMUNICATIONS INFRASTRUCTURE MANAGEMENT	• Communications Infrastructure Coordination	• Install communications infrastructure at signals on US 101 and US 20

TABLE 14: EXAMPLES OF ITS ELEMENTS	
ITS ELEMENT	**DESCRIPTION**
TRAFFIC CAMERAS (CCTV)	Closed-circuit television that help agency operators detect and quickly respond to congestion, incidents, and other problems on the road. The camera images can be broadcasted to the public, to the media, and to other emergency responders and public agencies.
ROAD/WEATHER INFORMATION SYSTEMS (RWIS)	RWIS stations are installed along the roadway with instruments and equipment, which provide weather and road surface condition observations. This information is used to help with decisions on maintenance strategies and to provide information to drivers. These stations may measure: • Air and road surface temperature • Barometric pressure • Humidity • Wind speed and direction • Precipitation • Visibility • Road surface condition (dry, wet, freezing, etc)

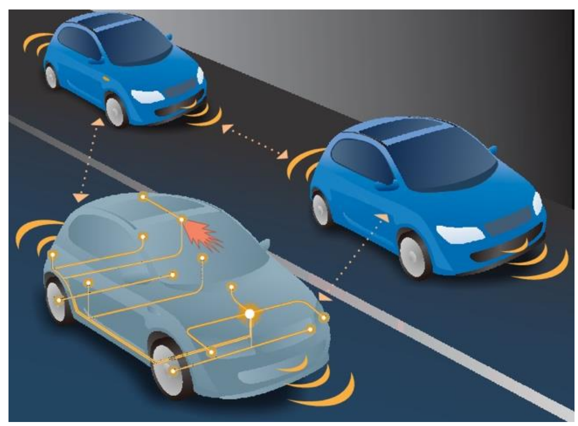
ELECTRIC VEHICLES

Electric Vehicles (EVs) have been on the road for decades, but are becoming more economically feasible as the production costs of batteries decline, the potential range increases, and vehicle fuel prices increase. EVs rely on an electric engine to travel, eliminating tailpipe emissions, and can be more sustainable depending on the source used to generate electricity. Although increases in vehicle range have increased, EVs still require charging infrastructure for longer-distance trips or for local residents who lack charging infrastructure at their homes.

To accommodate a future where electric vehicles are the majority of the vehicle fleet, additional charging infrastructure will be required. Cities, electric utilities, regions, and states will need to work together to create enough reliable electricity supply to fulfill the increased electrical demand. Oregon HB 2180 allows city planning directors to require EV charging facilities as part of commercial, multifamily residential, or mixed-use buildings with five or more dwelling units[13]. Currently, Newport has also budgeted funds to install EV charging at the Oregon Coast Aquarium, City Hall, and the Earnest Bloch Memorial Wayside.

CONNECTED, AUTONOMOUS, AND SHARED VEHICLES

Emerging transportation technologies will shape streets, communities, and daily lives for generations. Vehicles are becoming more connected, automated, and shared. While the timing of when these advances will occur is uncertain, they will have significant impacts on how a community plans, designs, builds, and uses the transportation system. Below are some important emerging transportation technology terms and definitions that provide the basis for the impacts, policies and action items discussed in the following sections.



- **Connected vehicles** (CVs) will enable communications between vehicles, infrastructure, and other road users. This means that vehicles will be able to assist human drivers and prevent crashes while making the system operate more smoothly.
- **Automated vehicles** (AVs) will, to varying degrees, take over driving functions and allow travelers to focus their attention on other matters. Vehicles with combined automated functions like lane keeping and adaptive cruise control exist today. In the future, more sophisticated sensing and programming technology will allow vehicles to operate with little to no operator oversight.
- **Shared vehicles** (SVs) allow ride-hailing companies to offer customers access to vehicles through cell phone applications. Ride-hailing applications give on-demand transportation with comparable convenience to car ownership without the hassle of maintenance and parking. Examples of shared vehicles include companies like Uber and Lyft.

Many of these technologies will not be exclusive of the others and it is important to think of the host of implications that arise from the combination of them. These vehicles are referred to as

[13] *House Bill 2180*. https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2180/Enrolled

connected, automated, and shared (CAS) vehicles. These technologies can also be implemented in coordination with existing EV technology.

IMPACTS OF CAS VEHICLES

CONGESTION AND ROAD CAPACITY

There are several competing forces that will unfold as connected, automated, and shared vehicles are deployed. It is difficult to predict how these vehicles will influence congestion and road capacity.

- AVs will provide a more relaxing or productive ride experience and people may have less resistance to longer commutes.
- Shared AVs are projected to have lower fuel and operating costs, making them less expensive on a per mile basis than private vehicle ownership. This may increase demand for auto-based travel in the future.
- CV technology will allow vehicles to operate safely with closer following distance, less unnecessary braking, and better coordinated traffic control. This will increase road capacity in the long run when CVs and AVs comprise most of the public and private fleet of vehicles.
- In the near term, since AVs make up a fraction of the fleet of vehicles, road capacity could decrease as AVs will operate more slowly and cautiously than regular vehicles.
- A new class of traffic – zero-occupant vehicles – will increase traffic congestion. These could include AVs making deliveries or shared AVs circulating around the city and traveling to their next rider.
- Roadways may need to be redesigned or better maintained to accommodate the needs of automated driving systems. For instance, striping may need to be wider and more consistently maintained to ensure the vehicle's sensors can recognize it.

These points raise questions about the degree to which CASvehicles will impact road capacity and congestion. The development and use of the technologies should be monitored closely.

TRANSIT

AVs could become cost competitive with transit and reduce transit ridership as riders prefer a more convenient alternative. However, transit will remain the most efficient way to move high volumes of people through constricted urban environments. AVs will not eliminate congestion and as discussed above, could exacerbate it – especially in the early phases of AV adoption. In addition, shared AVs may not serve all sectors of a community so many will still require access to transit to meet their daily needs.

PARKING

Because AVs will be able to park themselves, travelers will elect to get dropped off at their destination while their vehicle finds parking or its next passenger. Shared AVs will have an even greater impact on parking because parking next to the destination will no longer be a priority for the traveling public. This means that parking may be over-supplied in some areas and new opportunities to reconfigure land use will emerge. Outstanding questions related to parking include:

- How does vehicle ownership impact parking behavior?
- What portion of the AV fleet will be shared?
- How far out of the downtown area will AVs be able to park while remaining convenient and readily available?

CURB SPACE

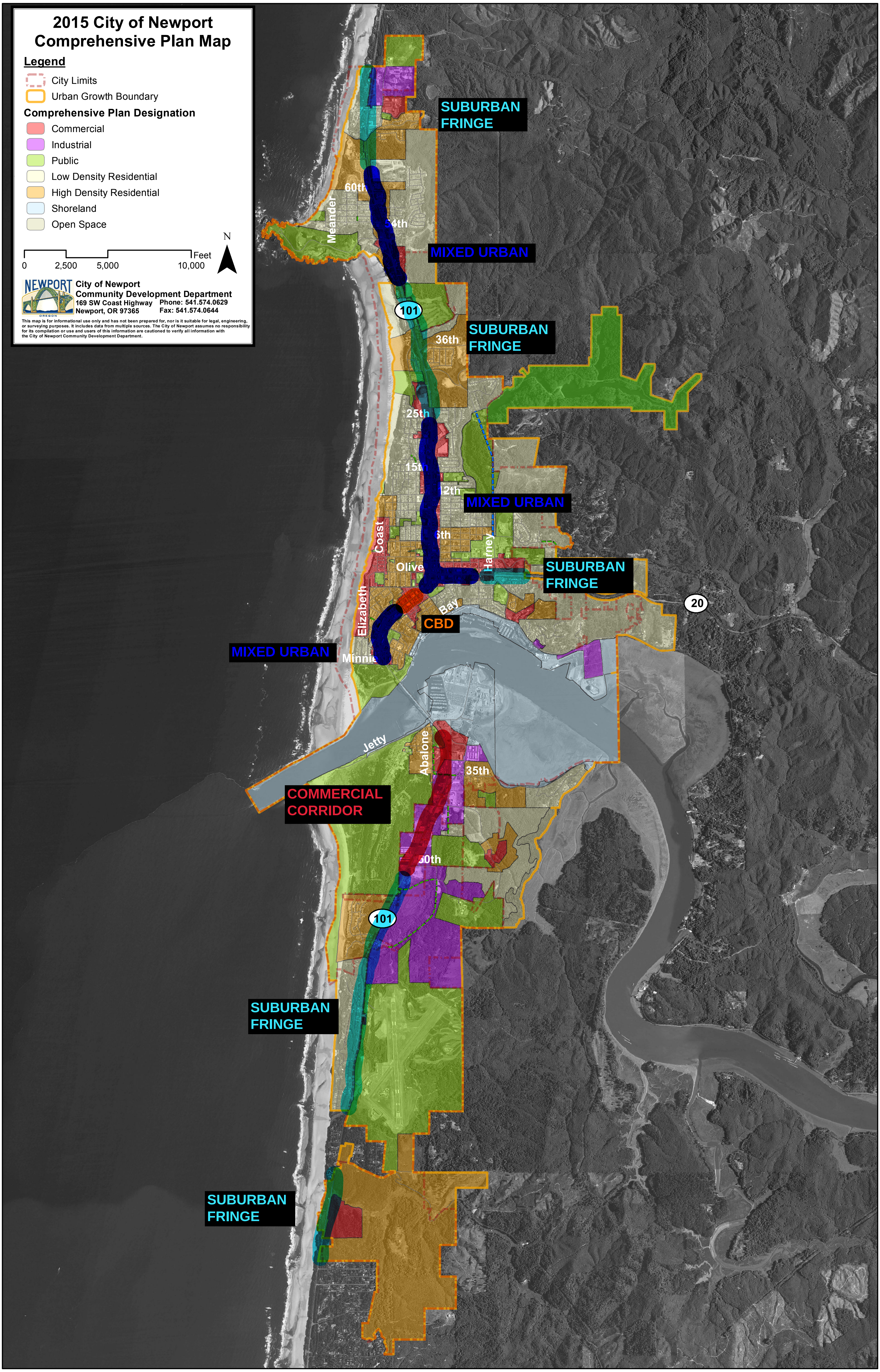
In addition to parking impacts, the ability to be dropped off at the destination will create more potential for conflicts in the right-of-way between vehicles that are dropping passengers off or picking them up, vehicles moving through traffic, and vehicles parked on the street. This issue is already occurring in many urban areas with ride-hailing companies, where popular destinations are experiencing significant double-parking issues.

AVs will also be used to deliver packages and food. This may mean that delivery vehicles need to be accommodated in new portions of the right-of-way. For instance, if the AV parks at the curb in a neighborhood and smaller robots are used to deliver packages from door to door, new conflicts will arise between vehicles, pedestrians, robots, and bicyclists.

APPENDIX

CONTENTS

SECTION 1. BLUEPRINT FOR URBAN DESIGN: URBAN CONTEXT DESIGNATIONS



2015 City of Newport
Comprehensive Plan Map
Legend
City Limits
Urban Growth Boundary
Comprehensive Plan Designation
Commercial
Industrial
Public
Low Density Residential
High Density Residential
Shoreland
Open Space
N
0
2,500
5,000
10,000
Feet
NEWPORT
OREGON
City of Newport
Community Development Department
169 SW Coast Highway
Newport, OR 97365
Phone: 541.574.0629
Fax: 541.574.0644
This map is for informational use only and has not been prepared for, nor is it suitable for legal, engineering, or surveying purposes. It includes data from multiple sources. The City of Newport assumes no responsibility for its compilation or use and users of this information are cautioned to verify all information with the City of Newport Community Development Department.
SUBURBAN FRINGE
60th
Meander
54th
MIXED URBAN
101
SUBURBAN FRINGE
36th
25th
15th
12th
MIXED URBAN
Coast
6th
Harney
Olive
SUBURBAN FRINGE
20
Elizabeth
Bay
CBD
MIXED URBAN
Minnie
Jetty
Abalone
35th
COMMERCIAL CORRIDOR
50th
101
SUBURBAN FRINGE
SUBURBAN FRINGE

SECTION 2. GEOTECHNICAL GUIDANCE FOR AGATE BEACH

Foundation Engineering, Inc.
Professional Geotechnical Services

DRAFT

Memorandum

Date: October 11, 2020

To: Carl Springer, P.E., P.T.P.
DKS Associates, Inc.

From: David Running, P.E., G.E.

Subject: Geotechnical Consultation for Agate Beach

Project: Newport Transportation System Plan Update
Project No.: 2191027-103

This memorandum provides a brief summary of the geotechnical challenges and constraints related to siting and developing new transportation improvement projects in Agate Beach.

BACKGROUND

The City of Newport and the Oregon Department of Transportation are currently updating the City's Transportation System Plan (TSP) to enhance safety, improve access and mobility, and address future transportation needs. DKS Associates, Inc. (DKS) is the design lead for the project. DKS retained Foundation Engineering to provide geotechnical consultation. The current work is focused on evaluating transportation improvement options for the Agate Beach neighborhood.

DISCUSSION

The geotechnical challenges in Agate Beach include mapped landslide and coastal erosional hazards that will prohibit development of new transportation projects adjacent to the ocean bluff along the west margin of the neighborhood. Figure 1 (attached) shows the current landslide hazard map for Agate Beach obtained from the DOGAMI SLIDO 4.1 website (DOGAMI, 2020a). Figure 2 (attached) shows the current coastal erosion hazard map for Agate Beach obtained from the DOGAMI HAZVU website (DOGAMI, 2020b). Transportation improvements will need to be setback from existing bluffs or areas of mapped landslide topography and focus on the relatively flat terrain in the neighborhood to the east. The setback from the bluff may be assumed to coincide with the eastern extent of the landslide terrain shown on Figure 1, which also approximately corresponds to eastern boundary of the high coastal erosion hazard area.

The potential presence of undocumented fill in the flat terrain within the Agate Beach neighborhood is another geotechnical consideration. The flat terrain was formerly rolling hills and ravines similar to the terrain in the undeveloped areas to the east of Hwy. 101. The contrast between the developed and undeveloped terrain can be seen in the LiDAR imaging shown on Figure 3 (attached). Like much of the developed coastal areas in and around Newport, the current flat terrain in Agate

DRAFT

Beach is the result of extensive site grading. Much of the historic site grading in the coastal communities was not conducted in accordance with current engineering standards. Poorly-placed fill and buried organics are common in former ravines and low-lying areas. Therefore, even in the current flat terrain, potential geologic hazards may exist that can result in settlement of roadways and pathways. Once preferred alignments for the proposed transportation improvement projects are identified, the subsurface conditions will need to be evaluated and geologic hazards will need to be addressed, where they are encountered.

We trust this information satisfies your current needs. Please feel free to contact us if you have questions or require additional information.

DRAFT

REFERENCES

DOGAMI, 2020a, *SLIDO (Statewide Landslide Information Database for Oregon) Viewer, SLIDO-4.1:* Oregon Department of Geology and Mineral Industries (DOGAMI), website: https://gis.dogami.oregon.gov/maps/slido/, accessed October 11, 2020.

DOGAMI, 2020b, *Oregon HazVu: Statewide Geohazards Viewer:* Oregon Department of Geology and Mineral Industries (DOGAMI), website: https://gis.dogami.oregon.gov/maps/hazvu/, accessed October 11, 2020.

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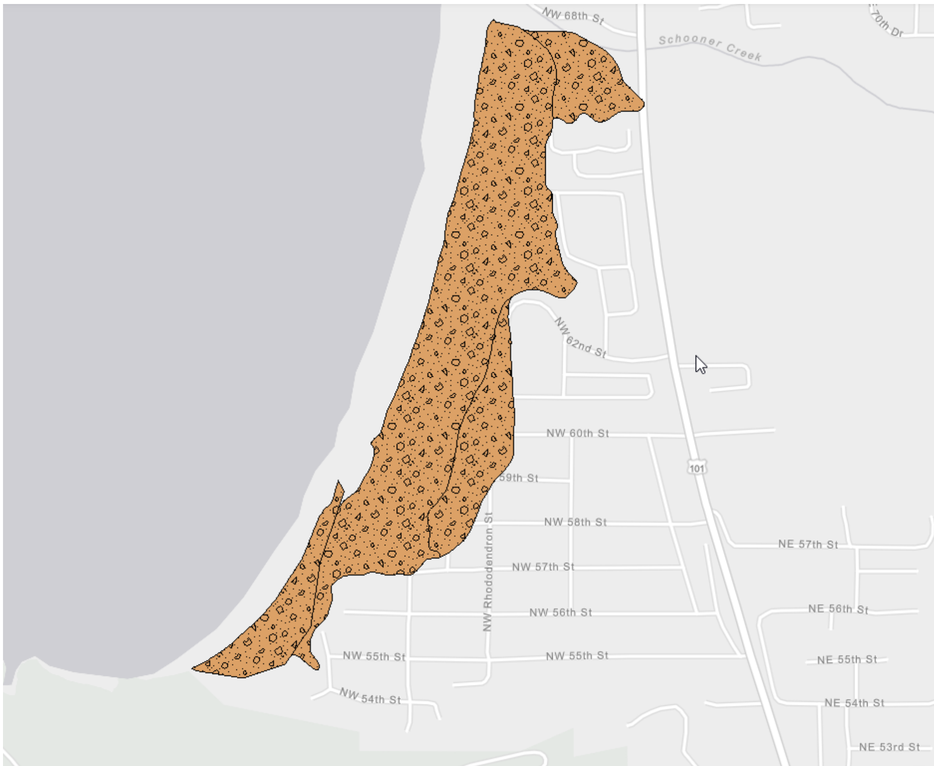

Figure 1. Landslide Hazard Map for Agate Beach (DOGAMI, 2020a).

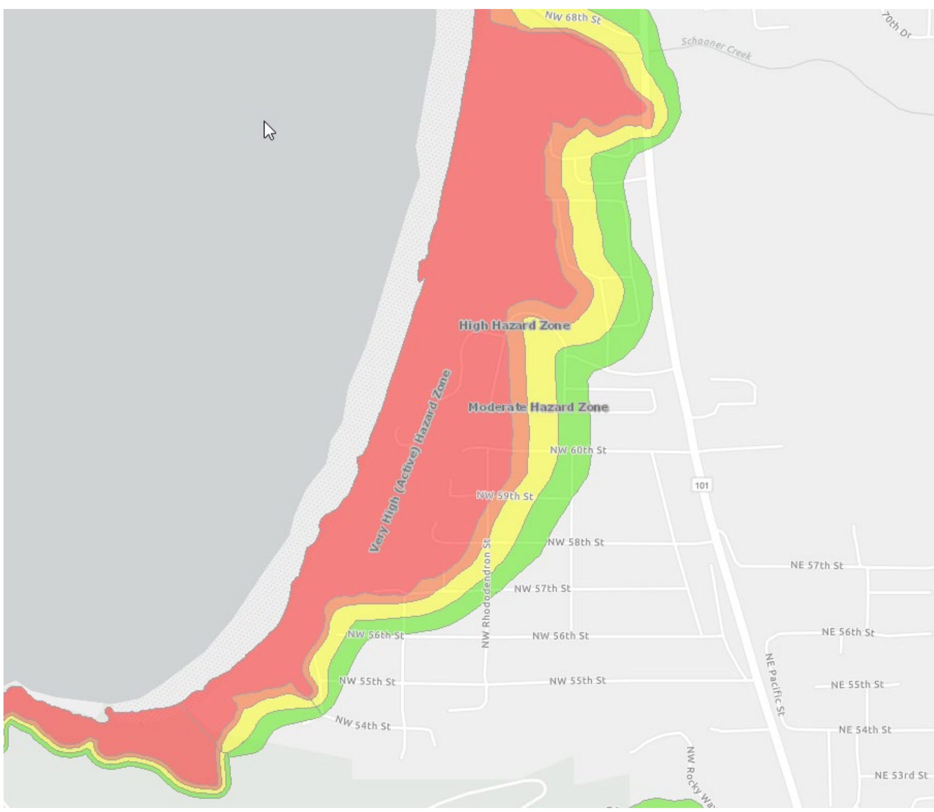

Figure 2. Coastal Erosion Hazard Map for Agate Beach (DOGAMI, 2020b).

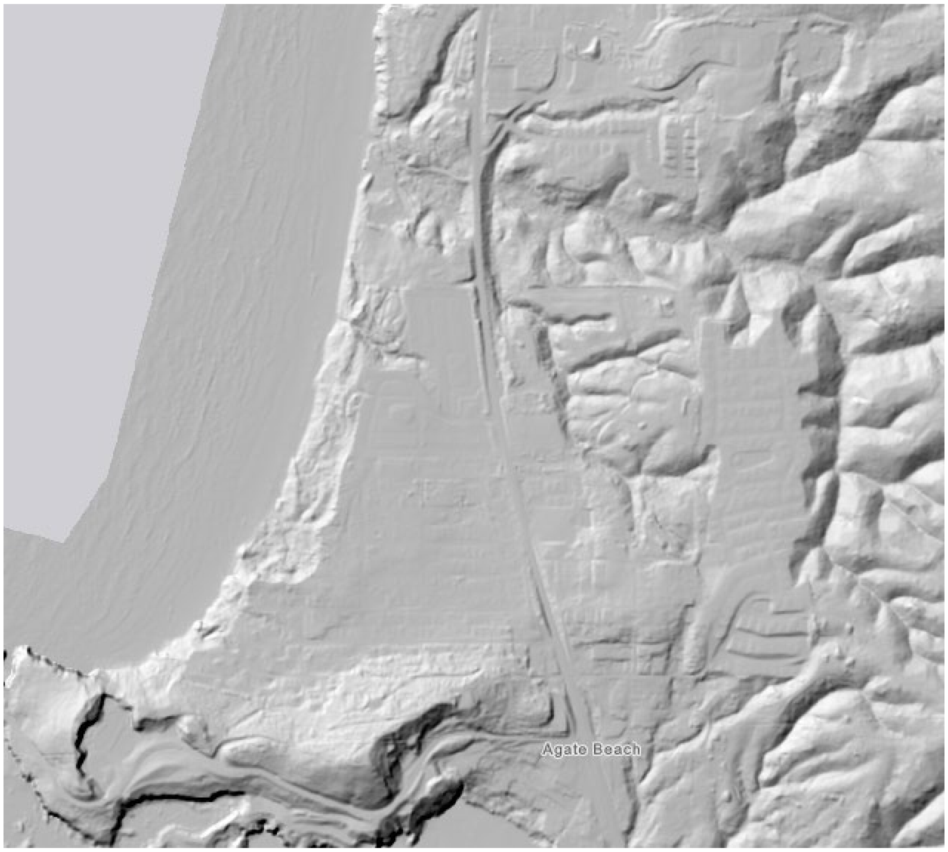

Figure 3. LiDAR Image for Agate Beach (DOGAMI, 2020a).

APPENDIX K- TECHNICAL MEMORANDUM #11: ALTERNATE MOBILITY TARGETS

ALTERNATIVE MOBILITY TARGETS

DATE: October 29, 2021

TO: Project Management Team

FROM: Kayla Fleskes, Rochelle Starrett, Kevin Chewuk, Carl Springer | DKS

SUBJECT: Newport TSP Update

Technical Memorandum #11: Alternative Mobility Targets

Project #17081-007

This technical memorandum summarizes an evaluation of locations where alternate mobility targets are needed on the State highway system within Newport. This memorandum follows the evaluation process outlined in the Planning Business Line Team Operational Notice PB-02[1]. Final review and approval of alternative mobility targets for State highway corridors will be an action of the Oregon Transportation Commission (OTC).

INTRODUCTION

The Oregon Highway Plan (OHP) identifies highway mobility targets for maintaining acceptable and reliable levels of mobility on the state highway system, consistent with expectations for each facility type, location, and functional objectives[2]. The adopted mobility targets are the initial tool for identifying deficiencies and considering solutions for vehicular mobility on the state system. However, consistent with OHP Policy 1F, the ability to meet OHP mobility targets may not be compatible with a community's adopted land use plan, financial capacity, or goals. In these cases, alternative mobility targets can be explored for a facility to adjust long-term roadway performance expectations. Alternative mobility targets are only applied to intersections under state jurisdiction (i.e., an intersection located on the state highway system). Mobility targets for intersections under city jurisdiction are identified in the transportation standards memo of this TSP update.

It is important for a transportation system plan to identify a broad range of transportation system projects and services to address the deficiencies that would exist at the end of a 20-year planning horizon if the community grows in accordance with its adopted land use plan. However, it is also important to realistically identify which transportation projects and services are reasonably likely to be implemented over the 20-year planning horizon, based on financial or other constraints. This exercise enables the community and the state to establish realistic expectations for how that transportation system will likely operate at the end of the 20-year planning horizon.

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[1] Planning Business Line Team Operational Notice PB-02, Oregon Department of Transportation, effective May 2, 2013.

[2] *1999 Oregon Highway Plan, as amended May 2015*, Policy 1F: Highway Mobility Policy, Oregon Department of Transportation

Because of the financial constraints that have been faced by state and local governments over the last 20 years and which are expected to continue into the foreseeable future, it is often the case that the local and/or state roadways will not be able to meet local level-of-service (LOS)[3] standards or, in the case of ODOT, roadway volume-to-capacity (v/c)[4] ratio-based mobility targets, at the end of the 20-year planning horizon if the community grows in accordance with its land use plan. Exceeding existing mobility targets is particularly common in larger communities or in those with roadways that experience higher travel demands. In these cases, it is appropriate to adjust roadway performance expectations, as expressed through local LOS standards or state mobility targets, to match the performance that is forecasted to exist at the end of the 20-year planning horizon, through the adoption of alternative standards or mobility targets.

In these situations, adopting alternative standards or mobility targets means adjusting roadway performance expectations to match realistic expectations for how the roadways are forecasted to operate, considering financial and other constraints. In addition to establishing realistic expectations for future system performance, this process will help reduce the need to include state and local investment projects that both parties acknowledge are unlikely to be achieved or that are counter to a community's adopted land use plan and goals.

ALTERNATIVE MOBILITY TARGET NEED

In Newport, US 20 and US 101 bisect the city and are the major transportation routes through Newport. In many cases (such as approaching the Yaquina Bay Bridge), parallel routes do not exist. US 20 and US 101 are classified as Statewide Highways, which typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports and major recreation areas that are not directly served by Interstate Highways. US 101 north of US 20 is a National Network freight route while US 20 is a designated freight route in the Oregon Highway Plan. US 101 (north of US 20) and US 20 are also freight reduction review routes.

Given the population and employment growth projected over the 20-year planning horizon, significant stretches of US 20 and US 101 through Newport are forecast to exceed ODOT's current mobility targets. Existing capacity constraints on the Yaquina Bay Bridge may also continue to impact operations on US 20 and US 101 in Newport since constructing a replacement bridge may not be feasible within the 20-year planning horizon. An evaluation of the disparity between the current targets and forecasted traffic operations confirmed the need for assessing the potential for alternative mobility targets to balance the community's vision established through the Newport TSP goals and objectives. The findings of that evaluation are described below.

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[3] LOS standards are based on the delay experienced by drivers at a particular location where higher delay corresponds to worse levels of service.

[4] V/C ratios describe the ability of an intersection to handle additional traffic demands before experiencing excessive delay or long vehicle queues; v/c ratios that exceed 1.00 indicate that the vehicle demand exceeds the theoretical capacity.

CURRENT MOBILITY TARGETS

All US 20 and US 101 intersections in Newport must comply with the volume-to-capacity (v/c) ratio targets in Table 6 of the OHP. ODOT v/c ratio mobility targets are based on highway classification, posted speed and area type. Within Newport, US 20 and US 101 are classified as Statewide Highways. Therefore, the v/c target ranges from 0.80 to 0.95, as listed in Table 1 below. Note that alternative mobility targets have previously been adopted on US 101 in South Beach.

TABLE 1: EXISTING MOBILITY TARGETS FOR US 20 AND US 101

ROADWAY	EXTENTS	EXISTING V/C MOBILITY TARGET	
		SIGNALIZED	UNSIGNALIZED [A]
US 101	North Urban Growth Boundary to NE 20th Street	≤ 0.80	≤ 0.80/0.90
US 101	NE 20th Street to SE 40th Street [B]	≤ 0.90	≤ 0.90/0.95
US 101	SE 40th Street to south Urban Growth Boundary [B]	≤ 0.80	≤ 0.80/0.90
US 20	Urban Growth Boundary to Moore Drive	≤ 0.80	≤ 0.80/0.90
US 20	Moore Drive to US 101	≤ 0.85	≤ 0.85/0.95

[A] For unsignalized intersections, the mobility target is listed for major approach (highway approach)/minor approach (side street approach).

[B] Alternative mobility targets have been adopted at the intersection of US 101/S 35th St (v/c ≤0.99), US 101/SE 32nd St (v/c ≤0.99), US 101/SE 40th St (v/c ≤0.99) and US 101/South Beach State Park Entrance (v/c ≤0.85) based on the Average Annual Weekday traffic condition.

The mobility targets in the OHP are based on conditions present during the 30th highest annual hour of traffic (30 HV), which in Newport typically occurs during the summer months when traffic volumes increase due to an influx of vacationers and visitors. Newport's position along the Oregon Coast and US 101 leads to significant variations in traffic throughout the year; traffic volumes along US 101 are approximately 20% higher during July and August compared to average weekday volumes. Due to the seasonal variation in traffic volumes, the alternative mobility targets adopted for South Beach are based on the Average Annual Weekday traffic condition rather than the 30 HV traffic condition.

EXISTING AND FUTURE HIGHWAY OPERATIONS

In the TSP, a comparison of existing (year 2018) and future (year 2040) traffic operations along US 101 and US 20 to adopted mobility targets during summer traffic conditions (30 HV) shows that most intersections operate well today, but traffic demand in the summer p.m. peak period at several intersections will exceed capacity by 2040.

Table 2 also demonstrates the results of doing nothing (retaining the system as it exists today) versus implementing the Financially Constrained and other reasonably likely funded projects included in the TSP in 2040 (Table 3). The table compares baseline operations to the Oregon

Highway Plan (OHP) mobility targets. Note that currently adopted mobility targets/standards for US 101 are based on accommodating summertime conditions.

While the US 101/36th, US 101/31st, and US 101/20th intersections are shown to meet mobility targets within Table 2, this does not account for the recent UGB land swap in the area. A land swap occurred within the northeast part of the City that removed 71.36 acres with limited development potential and replaced it with 40-acres with high development potential. This additional development potential would add up to 200 residential units in this area and is expected to further degrade intersection operations. The corresponding analysis for the UGB land swap reported operations at the US 101/36th, US 101/31st, and US 101/20th that would be expected to exceed mobility targets[5].

TABLE 2: INTERSECTION OPERATIONS ON US 101 AND US 20 WITHOUT AND WITH REASONABLY LIKELY IMPROVEMENTS (2018 AND 2040 PM PEAK HOUR, 30 HV)

#	STUDY INTERSECTION	TRAFFIC CONTROL	MOBILITY TARGET [A]	EXISTING V/C	2040 NO BUILD V/C	2040 FINANCIALLY CONSTRAINED V/C
1	US 101/73rd	Urban 4ST	0.80 / 0.95	0.41/0.46	**0.55/1.57**	0.75
2	US 101/52nd	Urban 4SG	0.80	**0.85**	**1.06**	**1.06**
3	US 101/ Oceanview	Urban 3ST	0.80 / 0.95	0.58/0.36	**0.72/1.12**	**0.72/1.12**
4	US 101/36th	Urban 3ST	0.80 / 0.95	0.58/0.16	0.68/0.24 *	0.68/0.24 *
5	US 101/31st	Urban 3ST	0.80 / 0.95	0.61/0.16	0.71/0.30 *	0.71/0.30 *
6	US 101/20th	Urban 4SG	0.90	0.73	0.88 *	0.88 *
7	US 101/11th	Urban 4SG	0.90	0.54	0.65	0.65
8	US 101/6th	Urban 4SG	0.90	0.69	0.81	0.81
9	US 101/US 20	Urban 4SG	0.85	**0.92**	**0.99**	**0.99**
10	US 101/Angle	Urban 4ST	0.90 / 0.95	0.37/0.71	**0.49/2.63**	0.38/0.06

[5] Newport UGB Land Exchange, KAI, April 1, 2020.

#	STUDY INTERSECTION	TRAFFIC CONTROL	MOBILITY TARGET [A]	EXISTING V/C	2040 NO BUILD V/C	2040 FINANCIALLY CONSTRAINED V/C
11	US 101/ Hurbert	Urban 4SG	0.90	0.74	**0.90**	0.56
12	US 101/Bayley	Urban 4ST	0.90 / 0.95	0.33/0.39	0.41/0.79	0.41/0.79
13	US 20/Benton	Urban 4ST	0.85 / 0.95	0.43/0.75	**0.46/1.05**	**0.46/1.05**
14	US 20/Moore	Urban 4SG	0.85	0.68	**0.85**	0.63
18	9th (Proposed US 101N) /Hurbert	Urban 4ST	0.90 / 0.95	0.06/0.41	0.06/0.44	0.43/0.67

Bold and Red values indicate the adopted mobility target would not be met.

* These operational results do not account for the recent UGB land swap in the area that would increase development potential with an additional 200 residential units. This is expected to further degrade intersection operations, and each would be expected to exceed mobility targets.

[A] For unsignalized intersections, the mobility target is listed for major approach (highway approach)/minor approach (side street approach).

Note: At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

The project category distribution in the financially constrained list is as follows:

- Intersection – 5 projects
- Road Extension – 5 projects
- Revision – 2 projects
- Sidewalk – 19 projects
- Shared-use path – 4 projects
- Bike route – 12 projects
- Separated bike lanes – 3 projects
- Bike Lanes – 11 projects
- Pedestrian crossings – 15 projects
- Programs – 1 project

Of these projects the 5 intersection related projects and one roadway revision project, the US 101 short couplet, are expected to directly impact traffic operations at the study intersections. Beyond the 5 intersection related projects, one intersection improvement was identified as reasonably likely funded even though this improvement is not included on the financially constrained project list. Development pressures at this intersection will drive the need for this improvement. These projects are shown in Table 3.

As noted earlier in this document, additional development associated with a recent UGB land swap near the US 101/36th, US 101/31st, and US 101/20th intersections may also make it necessary to implement an intersection improvement in the area. While it was not included in this analysis, a

TSP project would add a signal at the US 101/NE 36th intersection (TSP Project INT8). This would also improve the substandard operations reported in the UGB land swap analysis (see earlier referenced memorandum) at this intersection and at the nearby US 101/31st intersection as traffic could reroute during congested times to the new signal at the NE 36th Street intersection.

TABLE 3: FINANCIALLY CONSTRAINED AND REASONABLY LIKELY FUNDED INTERSECTION IMPROVEMENTS

TSP PROJECT ID	LOCATION	DESCRIPTION
INT1	US 101/NE 73rd Street	Complete an intersection control evaluation: either a traffic signal or roundabout are potential solutions Note: this project is not included in the financially constrained project list, but is considered reasonably likely to be funded due to future development
INT4	US 101/US 20	Install advance signage to detour westbound right turning vehicles onto NE 1st Street
INT6	US 101/SE Moore Drive/NE Harney Street	Complete an intersection control evaluation: confirm that a traffic signal (with separate left turn lanes on the northbound and southbound approaches) is the best solution
INT9	US 101/SW 40th Street	Complete an intersection control evaluation: either a traffic signal or roundabout are potential solutions
INT11	US 101/NW 6th Street	Realign intersection to eliminate offset approaches on NW 6th Street
INT12	US 101/NE 57th Street	Realign approach to align with NW 58th Street
US 101 SHORT COUPLET	Fall St to Angle St – US 101	Construct a couplet for US 101 with the southbound direction along the current highway right of way and the northbound direction along 9th Street

FACTORS LIMITING THE ABILITY TO MEET EXISTING MOBILITY TARGETS

Several factors combine to make compliance with current mobility targets within Newport difficult. They include the following:

PROJECTED MULTIMODAL TRAVEL NEEDS

The importance of US 20 and US 101 to statewide, regional, and local travel creates significant multimodal demands for both short and long trips along the corridor. These users include:

- People driving on US 101 and US 20 to make local trips to homes, work, and shopping
- People driving for regional trips between cities on the Oregon Coast
- Freight traveling to and through Newport (US 101 (north of US 20) and US 20 are both freight routes)
- Transit traveling along the main state facility or turning at a local street
- People biking and walking along and across US 101 and US 20 (US 101 is a major touring bicycle route as well as a means of transportation for local residents)

Balancing the needs of each of these various users is incorporated in the goals of the Newport TSP and factored into identifying reasonably likely to be funded projects and programs for the Newport TSP.

EXISTING AND PLANNED DEVELOPMENT PATTERNS

In many areas along US 101 and US 20, adjacent existing development and planned urban form promoting increased density and mixed land use constrain the ability to widen the highway right-of-way or provide parallel alternate routes. Obtaining needed right-of-way for highway widening would require acquisition and removal of such development, which would be very expensive and counter to the goals and objectives of the community[6]. Newport is also built around Yaquina Bay which limits travel options to the highway for residents travelling between the northern and southern sections of the city. Existing capacity constraints on the Yaquina Bay Bridge may continue to impact operations on US 20 and US 101 in Newport since constructing a replacement bridge may not be feasible within the 20-year planning horizon even if widening elsewhere is feasible.

FINANCIAL FACTORS

As is true for most agencies, funding for transportation improvements is limited and constrains the ability of ODOT to fund highway capacity improvements. The Newport TSP identifies a comprehensive set of transportation solutions resulting in $78,525,000 worth of projects deemed reasonably likely to be funded in the 20-year planning horizon, including many projects on state highways. However even with the projects and programs identified as reasonably likely to be funded, there are remaining facility mobility target performance deficiencies that could not be addressed within the funding constraints.

OTHER STRATEGIES BEING APPLIED TO ENHANCED MOBILITY

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[6] The City of Newport identified a goal for Fiscal Responsibility for the transportation system which supports preservation and maintenance of the City's existing transportation system. Newport TSP Update. *Technical Memo 4 – Goals and Objectives.* 2019.

In addition to funding capacity improvements, the Newport TSP identifies funding for programs and policies to improve multimodal conditions and help reduce motor vehicle demand. This includes 66 active transportation projects including bike routes, sidewalk improvements, and shared-use paths that are reasonably likely to be funded by 2040. It also includes a parking management program for the Nye Beach and Bayfront areas with the goal of increasing parking turnover and a neighborhood traffic management program intended to increase livability.

ALTERNATIVE MOBILITY TARGET EVALUATION

Figure 2 shows ODOT's methodology for determining alternative mobility targets[7]. A summary of each step is discussed below, and Table 4 lists the results for each individual intersection.

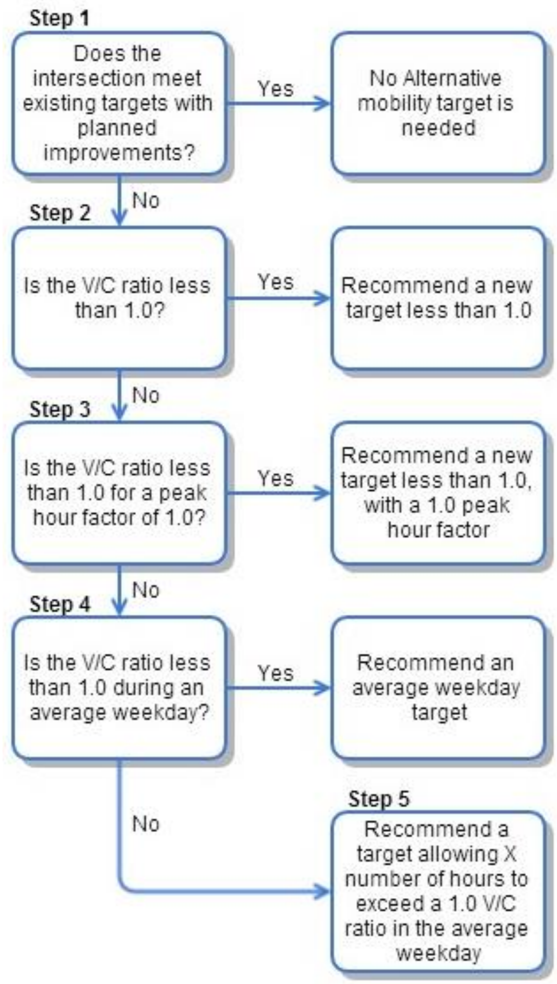

FIGURE 2: ALTERNATIVE MOBILITY TARGET METHODOLOGY

STEP 1: IMPLEMENT PLANNED IMPROVEMENTS

Prior to implementing alternative mobility targets, all feasible actions and improvements must be taken to meet the current targets. Even with the implementation of the Financially Constrained and Reasonably Likely Funded improvements in the City of Newport's TSP, alternative mobility targets will be needed at the following study intersections:

- US 101 & 52nd Street/Lighthouse Drive – v/c 1.06
- US 101 & Oceanview Drive – v/c 0.72/1.12
- US 101 & US 20 – v/c 0.99
- US 20 & Benton Street – v/c 0.46/1.05

STEP 2: INCREASE V/C TARGETS, STAYING BELOW CAPACITY

In cases where the v/c is forecasted to be greater than the OHP mobility target but less than capacity (v/c = 1.0) during the 30 HV, establish the proposed alternative target consistent with the v/c values used in the OHP. This approach would work for one of the intersections needing alternative mobility targets.

STEP 3: REMOVE PEAKING WITHIN THE PEAK HOUR

In cases where v/c is forecasted to be greater than or equal to capacity during the 30 HV using the standard analysis procedures, evaluate the actual peak hour traffic volume for future year 30 HV projections rather than expanding the peak 15 minutes to be the 30 HV. If the resulting v/c is less than 1.0, establish the proposed alternative target. Setting the peak hour factor (PHF) for the 30 HV to 1.0 relaxes the peaking assumptions and allows for analysis of the peak hour volumes

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[7] Planning Business Line Team Operational Notice PB-02, Oregon Department of Transportation, effective May 2, 2013.

instead of the peak 15-minute volumes. Removing peaking would work for all intersections needing alternative mobility targets.

STEP 4: ANALYZE AVERAGE WEEKDAY CONDITIONS

In cases where v/c is forecasted to be greater than or equal to capacity during the design hour using the actual peak hour projection of traffic and in areas where design hours are affected by high seasonal traffic volumes, evaluate the annual average weekday p.m. peak (AWD) as the future year design hour rather than the 30 HV. If the resulting v/c is less than 1.0, establish the proposed alternative target. Analyzing average weekday conditions instead of the 30 HV gives a more accurate representation of typical conditions instead of peak summer conditions when there is an influx of visitors in Newport. This step was not analyzed due to mobility targets of 1.0 during the 30 HV without peaking (Step 3) resolving the mobility target problem.

STEP 5: HOURS OF CONGESTION

In cases where v/c is forecasted to be greater than or equal to 1.0 using the Annual Average Weekday PM Peak as the future design hour, determine the duration of the period during which the future Annual Average Weekday PM Peak hour will have a v/c greater than or equal to 1.0. Establish the proposed alternative target by increasing the number of hours that v/c can be greater than or equal to 1.0. An "hours of congestion" analysis assumes that traffic volumes that exceed capacity in the analysis hour are shifted to the "shoulder' hours, iteratively, until all traffic can be accommodated. The calculation of multi-hour conditions with peak spreading is fairly complex and it can be difficult to achieve consistent results. Also, because only the most congested intersections make it to Step 5 when considering alternative mobility targets, it is often found that over-capacity conditions would be present for several hours of the day making such a target fairly ineffective. This step was not analyzed due to mobility targets of 1.0 during the 30 HV without peaking (Step 3) resolving the mobility target problem.

TABLE 4: INTERSECTION OPERATIONS ON US 101 AND US 20 WHEN APPLYING THE ALTERNATIVE MOBILTY TARGET METHODOLOGY (2040 PM PEAK HOUR)

#	STUDY INT.	CONTROL	EXISTING V/C MOBILITY TARGET [A]	STEP 1: 30 HV, W/ FINANCIALLY CONSTRAINED IMPROVEMENTS	STEP 2: 30 HV, V/C ≤ 1.0	STEP 3: 30 HV, V/C ≤ 1.0, PHF = 1.0
1	US 101/73rd	Urban 4ST	0.80 / 0.95	0.75	0.75	0.72
2	US 101/52nd	Urban 4SG	0.80	**1.06**	**1.06**	0.99
3	US 101/ Oceanview	Urban 3ST	0.80 / 0.95	**0.72/1.12**	**0.72/1.12**	0.68/0.96
4	US 101/36th	Urban 3ST	0.80 / 0.95	0.68/0.24 *	0.68/0.24 *	0.64/0.20
5	US 101/31st	Urban 3ST	0.80 / 0.95	0.71/0.30 *	0.71/0.30 *	0.66/0.25
6	US 101/20th	Urban 4SG	0.90	0.88 *	0.88 *	0.82
7	US 101/11th	Urban 4SG	0.90	0.65	0.65	0.61
8	US 101/6th	Urban 4SG	0.90	0.81	0.81	0.73
9	US 101/US 20	Urban 4SG	0.85	**0.99**[B]	0.99	0.93
10	US 101/Angle	Urban 4ST	0.90 / 0.95	0.38/0.06	0.38/0.06	0.35/0.05
11	US 101/ Hurbert	Urban 4SG	0.90	0.56	0.56	0.54
12	US 101/Bayley	Urban 4ST	0.90 / 0.95	0.41/0.79	0.41/0.79	0.37/0.51
13	US 20/Benton	Urban 4ST	0.85 / 0.95	**0.46/1.05**	**0.46/1.05**	0.44/0.90
14	US 20/Moore	Urban 4SG	0.85	0.63	0.63	0.58
18	9th (Proposed US 101N) /Hurbert	Urban 4ST	0.90 / 0.95	0.43/0.67	0.43/0.67	0.42/0.60

Bold and Red values indicate a v/c ratio greater than the mobility target at that step.

* These operational results do not account for the recent UGB land swap in the area that would increase development potential with an additional 200 residential units. This is expected to further degrade intersection operations, and each would be expected to exceed mobility targets. While it was not included in this analysis, a TSP project would add a signal at the US 101/NE 36th intersection (TSP Project INT8). This would improve intersections operations in this area from those reported with the analysis of the UGB land swap (see earlier referenced memorandum).

[A] For unsignalized intersections, the mobility target is listed for major approach (highway approach)/minor approach (side street approach).

[B] The proposed improvement does not improve the v/c ratio (from no build) because the WBR movement is not the critical movement for the phase. However the reduction of WBR turning volume will reduce queueing on that approach.

Note: At signalized study intersections the v/c, LOS and delay are reported as the intersection average and at unsignalized intersections the v/c, LOS and delay are reported for the worst highway approach/ worst side street approach.

RECOMMENDED ALTERNATIVE MOBILITY TARGETS

While the transportation investments identified as reasonably likely to be funded in the Newport TSP will result in improved intersection performance on ODOT facilities, not all intersections will be able to meet state v/c mobility targets. There is a need to consider alternative mobility targets in select locations, for the 30 HV condition. Alternative mobility targets establish realistic expectations for future system performance and help the community continue to grow in accordance with its adopted land use plan. Table 5 shows the existing and proposed mobility targets.

TABLE 5: EXISTING AND PROPOSED MOBILITY TARGETS

#	STUDY INT.	CONTROL	EXISTING V/C MOBILITY TARGET [A]	PROPOSED MOBILITY TARGET[B]
1	US 101/73rd	Urban 4ST	0.80 / 0.95	0.99, PHF = 1.0
2	US 101/52nd	Urban 4SG	0.80	0.99, PHF = 1.0
3	US 101/ Oceanview	Urban 3ST	0.80 / 0.95	0.99, PHF = 1.0
4	US 101/36th	Urban 3ST	0.80 / 0.95	0.99, PHF = 1.0
5	US 101/31st	Urban 3ST	0.80 / 0.95	0.99, PHF = 1.0
6	US 101/20th	Urban 4SG	0.90	0.99, PHF = 1.0
7	US 101/11th	Urban 4SG	0.90	0.99, PHF = 1.0
8	US 101/6th	Urban 4SG	0.90	0.99, PHF = 1.0
9	US 101/US 20	Urban 4SG	0.85	0.99, PHF = 1.0
10	US 101/Angle	Urban 4ST	0.90 / 0.95	0.99, PHF = 1.0
11	US 101/ Hurbert	Urban 4SG	0.90	0.99, PHF = 1.0
12	US 101/Bayley	Urban 4ST	0.90 / 0.95	0.99, PHF = 1.0
13	US 20/Benton	Urban 4ST	0.85 / 0.95	0.99, PHF = 1.0
14	US 20/Moore	Urban 4SG	0.85	0.99, PHF = 1.0

[A] For unsignalized intersections, the mobility target is listed for major approach (highway approach)/minor approach (side street approach).

[B] For unsignalized intersections the mobility target is for the worst approach (major or minor)

APPENDIX

CONTENTS

SECTION 1. HCM REPORTS

FINANCIALLY CONSTRAINED

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	5	95	0	15	5	885	60	20	690	2
Future Volume (veh/h)	1	0	5	95	0	15	5	885	60	20	690	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1654	1750	1750	1750	1709	1231	808	1709	1750
Adj Flow Rate, veh/h	1	0	5	100	0	16	5	932	63	21	726	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	7	0	0	0	3	38	69	3	0
Cap, veh/h	88	15	133	251	0	21	452	1086	663	212	1114	3
Arrive On Green	0.10	0.00	0.10	0.10	0.00	0.10	0.02	0.64	0.64	0.04	0.65	0.62
Sat Flow, veh/h	109	149	1288	1249	0	200	1667	1709	1043	770	1704	5
Grp Volume(v), veh/h	6	0	0	116	0	0	5	932	63	21	0	728
Grp Sat Flow(s),veh/h/ln	1546	0	0	1448	0	0	1667	1709	1043	770	0	1708
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	0.1	24.0	1.3	0.5	0.0	14.1
Cycle Q Clear(g_c), s	0.2	0.0	0.0	4.3	0.0	0.0	0.1	24.0	1.3	0.5	0.0	14.1
Prop In Lane	0.17		0.83	0.86		0.14	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	236	0	0	271	0	0	452	1086	663	212	0	1117
V/C Ratio(X)	0.03	0.00	0.00	0.43	0.00	0.00	0.01	0.86	0.09	0.10	0.00	0.65
Avail Cap(c_a), veh/h	592	0	0	620	0	0	592	1646	1005	263	0	1645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.2	0.0	0.0	24.0	0.0	0.0	5.1	8.0	3.9	9.0	0.0	5.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	3.1	0.1	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.5	0.0	0.0	0.0	4.1	0.1	0.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	0.0	0.0	25.1	0.0	0.0	5.1	11.1	3.9	9.2	0.0	6.4
LnGrp LOS	C	A	A	C	A	A	A	B	A	A	A	A
Approach Vol, veh/h		6			116			1000			749	
Approach Delay, s/veh		22.3			25.1			10.6			6.5	
Approach LOS		C			C			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	39.0		9.7	5.4	40.0		9.7				
Change Period (Y+Rc), s	5.0	6.0		4.0	5.0	6.0		4.0				
Max Green Setting (Gmax), s	5.0	51.0		19.0	5.0	51.0		19.0				
Max Q Clear Time (g_c+I1), s	2.5	26.0		2.2	2.1	16.1		6.3				
Green Ext Time (p_c), s	0.0	6.9		0.0	0.0	4.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary
2: US 101 & Lighthouse Dr/52nd St

10/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	5	90	95	0	15	55	1080	120	30	850	30
Future Volume (veh/h)	35	5	90	95	0	15	55	1080	120	30	850	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1750	1750	1750	1695	1682	1750	1750	1695	1750
Adj Flow Rate, veh/h	37	5	95	100	0	16	58	1137	0	32	895	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	0	0	0	4	5	0	0	4	0
Cap, veh/h	55	4	297	59	0	299	79	1123		52	1102	
Arrive On Green	0.20	0.20	0.20	0.20	0.00	0.20	0.05	0.67	0.00	0.03	0.65	0.00
Sat Flow, veh/h	0	19	1457	0	0	1468	1615	1682	1483	1667	1695	1483
Grp Volume(v), veh/h	42	0	95	100	0	16	58	1137	0	32	895	0
Grp Sat Flow(s),veh/h/ln	19	0	1457	0	0	1468	1615	1682	1483	1667	1695	1483
Q Serve(g_s), s	0.0	0.0	6.8	0.0	0.0	1.1	4.4	82.0	0.0	2.3	48.1	0.0
Cycle Q Clear(g_c), s	24.5	0.0	6.8	24.5	0.0	1.1	4.4	82.0	0.0	2.3	48.1	0.0
Prop In Lane	0.88		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	0	297	59	0	299	79	1123		52	1102	
V/C Ratio(X)	0.71	0.00	0.32	1.71	0.00	0.05	0.74	1.01		0.62	0.81	
Avail Cap(c_a), veh/h	59	0	297	59	0	299	105	1123		81	1104	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.9	0.0	41.7	61.2	0.0	39.4	57.6	20.4	0.0	58.8	15.9	0.0
Incr Delay (d2), s/veh	31.4	0.0	0.5	379.7	0.0	0.1	14.2	30.0	0.0	8.5	5.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	2.5	8.0	0.0	0.4	2.0	35.7	0.0	1.1	17.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.3	0.0	42.1	440.9	0.0	39.4	71.8	50.4	0.0	67.3	21.1	0.0
LnGrp LOS	F	A	D	F	A	D	E	F		E	C	
Approach Vol, veh/h		137			116			1195	A		927	A
Approach Delay, s/veh		56.9			385.5			51.5			22.7	
Approach LOS		E			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	83.8		29.0	7.8	86.0		29.0
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5
Max Green Setting (Gmax), s	7.5	78.0		24.5	5.5	80.0		24.5
Max Q Clear Time (g_c+I1), s	6.4	50.1		26.5	4.3	84.0		26.5
Green Ext Time (p_c), s	0.0	12.9		0.0	0.0	0.0		0.0

Intersection Summary			
HCM 6th Ctrl Delay			56.9
HCM 6th LOS			E

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	12.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	60	20	1150	970	55
Future Vol, veh/h	130	60	20	1150	970	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	300	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	11	5	4	4
Mvmt Flow	138	64	21	1223	1032	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2297	1032	1091	0	-	0
Stage 1	1032	-	-	-	-	-
Stage 2	1265	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.299	-	-	-
Pot Cap-1 Maneuver	~ 43	285	607	-	-	-
Stage 1	347	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 41	285	607	-	-	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	268	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	156.9	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	607	-	180	-	-
HCM Lane V/C Ratio	0.035	-	1.123	-	-
HCM Control Delay (s)	11.1	-	156.9	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	10.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	15	1085	40	10	995
Future Vol, veh/h	25	15	1085	40	10	995
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	125	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	31	4	0	0	3
Mvmt Flow	27	16	1154	43	11	1059

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2235	1154	0	0	1197	0
Stage 1	1154	-	-	-	-	-
Stage 2	1081	-	-	-	-	-
Critical Hdwy	6.4	6.51	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.579	-	-	2.2	-
Pot Cap-1 Maneuver	47	210	-	-	590	-
Stage 1	303	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	46	210	-	-	590	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	322	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.5	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	178	590	-
HCM Lane V/C Ratio	-	-	0.239	0.018	-
HCM Control Delay (s)	-	-	31.5	11.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection						
Int Delay, s/veh	0.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	10	1115	90	20	995
Future Vol, veh/h	35	10	1115	90	20	995
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	50	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	14	5	0	0	3
Mvmt Flow	38	11	1212	98	22	1082

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2338	1212	0	0	1310	0
Stage 1	1212	-	-	-	-	-
Stage 2	1126	-	-	-	-	-
Critical Hdwy	6.4	6.34	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.426	-	-	2.2	-
Pot Cap-1 Maneuver	41	209	-	-	535	-
Stage 1	284	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	39	209	-	-	535	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	284	-	-	-	-	-
Stage 2	300	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.8	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	161	535	-
HCM Lane V/C Ratio	-	-	0.304	0.041	-
HCM Control Delay (s)	-	-	36.8	12	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	55	80	325	30	90	60	1325	115	80	1075	20
Future Volume (veh/h)	40	55	80	325	30	90	60	1325	115	80	1075	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1723	1695	1736	1750	1723	1723	1695	1750	1709	1709	1750
Adj Flow Rate, veh/h	43	59	86	239	186	97	65	1425	124	86	1156	22
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	2	4	1	0	2	2	4	0	3	3	0
Cap, veh/h	59	80	117	323	211	110	82	1615	140	81	1756	33
Arrive On Green	0.08	0.08	0.08	0.20	0.20	0.19	0.05	0.54	0.53	0.05	0.54	0.53
Sat Flow, veh/h	711	976	1416	1654	1081	564	1641	2998	259	1628	3259	62
Grp Volume(v), veh/h	102	0	86	239	0	283	65	762	787	86	576	602
Grp Sat Flow(s),veh/h/ln	1687	0	1416	1654	0	1644	1641	1611	1647	1628	1624	1697
Q Serve(g_s), s	7.1	0.0	7.1	16.3	0.0	20.1	4.7	49.7	50.7	6.0	30.4	30.4
Cycle Q Clear(g_c), s	7.1	0.0	7.1	16.3	0.0	20.1	4.7	49.7	50.7	6.0	30.4	30.4
Prop In Lane	0.42		1.00	1.00		0.34	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	139	0	117	323	0	321	82	868	887	81	875	914
V/C Ratio(X)	0.73	0.00	0.74	0.74	0.00	0.88	0.79	0.88	0.89	1.06	0.66	0.66
Avail Cap(c_a), veh/h	169	0	142	358	0	356	82	868	887	81	875	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.71	0.71	0.71	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	0.0	53.8	45.4	0.0	47.0	56.4	24.2	24.5	57.0	19.8	19.8
Incr Delay (d2), s/veh	10.9	0.0	13.2	6.6	0.0	19.7	29.4	9.1	9.5	116.1	3.9	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.0	7.3	0.0	10.0	2.6	19.9	20.9	5.1	11.9	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.8	0.0	67.0	52.0	0.0	66.7	85.8	33.3	34.1	173.1	23.7	23.5
LnGrp LOS	E	A	E	D	A	E	F	C	C	F	C	C
Approach Vol, veh/h		188			522			1614			1264	
Approach Delay, s/veh		65.8			60.0			35.8			33.8	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	68.6		27.5	10.0	68.6		13.9				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	5.5	59.0		25.5	5.5	59.0		11.5				
Max Q Clear Time (g_c+I1), s	6.7	32.4		22.1	8.0	52.7		9.1				
Green Ext Time (p_c), s	0.0	16.0		0.7	0.0	5.7		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			40.2
HCM 6th LOS			D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	75	15	25	30	10	50	10	1500	15	15	1445	25
Future Volume (veh/h)	75	15	25	30	10	50	10	1500	15	15	1445	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1695	1750	1750	1750	1709	1750	1750	1709	1750
Adj Flow Rate, veh/h	79	16	26	32	11	53	11	1579	16	16	1521	26
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	4	0	0	0	3	0	0	3	0
Cap, veh/h	147	28	34	84	36	99	24	2525	26	30	2515	43
Arrive On Green	0.11	0.12	0.11	0.11	0.12	0.11	0.03	1.00	1.00	0.04	1.00	1.00
Sat Flow, veh/h	845	245	298	382	315	858	1667	3292	33	1667	3265	56
Grp Volume(v), veh/h	121	0	0	96	0	0	11	778	817	16	755	792
Grp Sat Flow(s),veh/h/ln	1388	0	0	1554	0	0	1667	1624	1702	1667	1624	1697
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.3	0.0	0.0	6.9	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0
Prop In Lane	0.65		0.21	0.33		0.55	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	204	0	0	213	0	0	24	1245	1305	30	1251	1308
V/C Ratio(X)	0.59	0.00	0.00	0.45	0.00	0.00	0.46	0.62	0.63	0.53	0.60	0.61
Avail Cap(c_a), veh/h	336	0	0	349	0	0	83	1245	1305	83	1251	1308
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.41	0.41	0.41	0.65	0.65	0.65
Uniform Delay (d), s/veh	51.7	0.0	0.0	50.2	0.0	0.0	57.8	0.0	0.0	57.4	0.0	0.0
Incr Delay (d2), s/veh	2.1	0.0	0.0	1.1	0.0	0.0	4.1	1.0	0.9	7.0	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	2.8	0.0	0.0	0.4	0.3	0.3	0.5	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.8	0.0	0.0	51.3	0.0	0.0	61.9	1.0	0.9	64.3	1.4	1.4
LnGrp LOS	D	A	A	D	A	A	E	A	A	E	A	A
Approach Vol, veh/h		121			96			1606			1563	
Approach Delay, s/veh		53.8			51.3			1.4			2.0	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	96.4		17.8	6.2	96.0		17.8				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	5.5	76.0		24.5	5.5	76.0		24.5				
Max Q Clear Time (g_c+I1), s	2.8	2.0		8.9	3.1	2.0		12.3				
Green Ext Time (p_c), s	0.0	51.9		0.3	0.0	54.0		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		5.0
HCM 6th LOS		A

HCM 6th Signalized Intersection Summary
8: US 101 & 6th St
10/26/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	35	30	75	20	35	35	1445	25	25	1400	30
Future Volume (veh/h)	90	35	30	75	20	35	35	1445	25	25	1400	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1750	1654	1750	1750	1709	1750	1709	1750	1750	1695	1750
Adj Flow Rate, veh/h	100	39	33	83	22	39	39	1606	28	28	1556	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	0	7	0	0	3	0	3	0	0	4	0
Cap, veh/h	127	50	42	113	30	53	55	1907	33	41	1855	39
Arrive On Green	0.12	0.13	0.12	0.10	0.12	0.10	0.03	0.58	0.57	0.05	1.00	1.00
Sat Flow, veh/h	954	372	315	932	247	438	1667	3265	57	1667	3225	68
Grp Volume(v), veh/h	172	0	0	144	0	0	39	797	837	28	776	813
Grp Sat Flow(s),veh/h/ln	1641	0	0	1617	0	0	1667	1624	1698	1667	1611	1682
Q Serve(g_s), s	12.2	0.0	0.0	10.4	0.0	0.0	2.8	48.2	48.5	2.0	0.0	0.0
Cycle Q Clear(g_c), s	12.2	0.0	0.0	10.4	0.0	0.0	2.8	48.2	48.5	2.0	0.0	0.0
Prop In Lane	0.58		0.19	0.58		0.27	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	219	0	0	195	0	0	55	948	992	41	927	968
V/C Ratio(X)	0.79	0.00	0.00	0.74	0.00	0.00	0.71	0.84	0.84	0.69	0.84	0.84
Avail Cap(c_a), veh/h	219	0	0	216	0	0	83	948	992	83	927	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.42	0.42	0.42	0.75	0.75	0.75
Uniform Delay (d), s/veh	51.1	0.0	0.0	51.8	0.0	0.0	57.4	20.4	20.5	56.6	0.0	0.0
Incr Delay (d2), s/veh	16.5	0.0	0.0	10.5	0.0	0.0	5.1	4.0	3.9	10.9	6.9	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	0.0	4.9	0.0	0.0	1.2	17.9	18.9	0.9	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	0.0	0.0	62.3	0.0	0.0	62.5	24.4	24.4	67.6	6.9	6.7
LnGrp LOS	E	A	A	E	A	A	E	C	C	E	A	A
Approach Vol, veh/h		172			144			1673			1617	
Approach Delay, s/veh		67.7			62.3			25.3			7.8	
Approach LOS		E			E			C			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	73.5		18.5	6.9	74.6		20.0
Change Period (Y+Rc), s	4.5	6.5		6.0	4.5	6.5		6.0
Max Green Setting (Gmax), s	5.5	63.5		14.0	5.5	63.5		14.0
Max Q Clear Time (g_c+I1), s	4.8	2.0		12.4	4.0	50.5		14.2
Green Ext Time (p_c), s	0.0	32.1		0.1	0.0	12.3		0.0

Intersection Summary		
HCM 6th Ctrl Delay		21.0
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Future Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1695	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	218	207	37	271	176	298	80	957	0	356	1037	85
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	4	7	2	2	0	4	10	4	3	3
Cap, veh/h	250	246	44	298	364	299	106	1114		256	1336	109
Arrive On Green	0.15	0.17	0.17	0.19	0.21	0.21	0.06	0.35	0.00	0.05	0.15	0.14
Sat Flow, veh/h	1654	1424	255	1576	1723	1414	1667	3221	1367	1615	3032	248
Grp Volume(v), veh/h	218	0	244	271	176	298	80	957	0	356	555	567
Grp Sat Flow(s),veh/h/ln	1654	0	1678	1576	1723	1414	1667	1611	1367	1615	1624	1657
Q Serve(g_s), s	15.5	0.0	16.9	20.2	10.8	25.3	5.7	33.2	0.0	19.0	39.5	39.6
Cycle Q Clear(g_c), s	15.5	0.0	16.9	20.2	10.8	25.3	5.7	33.2	0.0	19.0	39.5	39.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	250	0	291	298	364	299	106	1114		256	715	730
V/C Ratio(X)	0.87	0.00	0.84	0.91	0.48	1.00	0.75	0.86		1.39	0.78	0.78
Avail Cap(c_a), veh/h	317	0	322	302	364	299	111	1114		256	715	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	49.8	0.0	48.0	47.6	41.6	47.3	55.3	36.5	0.0	56.9	45.6	45.6
Incr Delay (d2), s/veh	17.6	0.0	15.8	29.0	1.0	51.6	22.9	8.7	0.0	186.8	3.6	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	0.0	8.4	10.3	4.7	13.2	3.1	14.4	0.0	21.5	18.0	18.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	0.0	63.9	76.6	42.6	98.9	78.2	45.2	0.0	243.6	49.2	49.2
LnGrp LOS	E	A	E	E	D	F	E	D		F	D	D
Approach Vol, veh/h		462			745			1037	A		1478	
Approach Delay, s/veh		65.5			77.5			47.7			96.0	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	56.9	22.2	29.3	23.0	45.5	26.7	24.8
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	7.5	49.0	22.5	22.5	18.5	38.0	22.5	22.5
Max Q Clear Time (g_c+I1), s	17.7	41.6	17.5	27.3	21.0	35.2	22.2	18.9
Green Ext Time (p_c), s	0.0	5.7	0.2	0.0	0.0	2.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	75.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	20	0	0	1025	0	0	0	0	1145	45
Future Vol, veh/h	0	0	20	0	0	1025	0	0	0	0	1145	45
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	16979	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	0	0	22	0	0	1126	0	0	0	0	1258	49

Major/Minor	Minor2									Major2		
Conflicting Flow All	1305	1305	693							-	-	0
Stage 1	1305	1305	-							-	-	-
Stage 2	0	0	-							-	-	-
Critical Hdwy	6.8	6.5	6.9							-	-	-
Critical Hdwy Stg 1	5.8	5.5	-							-	-	-
Critical Hdwy Stg 2	-	-	-							-	-	-
Follow-up Hdwy	3.5	4	3.3							-	-	-
Pot Cap-1 Maneuver	154	162	390							0	-	-
Stage 1	222	232	-							0	-	-
Stage 2	-	-	-							0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	148	0	382							-	-	-
Mov Cap-2 Maneuver	148	0	-							-	-	-
Stage 1	217	0	-							-	-	-
Stage 2	-	0	-							-	-	-

Approach	EB	SB
HCM Control Delay, s	15	0
HCM LOS	C	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	382	-	-
HCM Lane V/C Ratio	0.058	-	-
HCM Control Delay (s)	15	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	30	50	70	60	0	0	0	0	45	1085	20
Future Volume (veh/h)	0	30	50	70	60	0	0	0	0	45	1085	20
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	0.98		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1750	1750	1709	1682	0				1750	1723	1750
Adj Flow Rate, veh/h	0	31	52	72	62	0				46	1119	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	3	5	0				0	2	0
Cap, veh/h	0	89	149	126	94	0				99	2521	50
Arrive On Green	0.00	0.15	0.15	0.15	0.15	0.00				0.77	0.78	0.77
Sat Flow, veh/h	0	579	972	522	610	0				127	3234	64
Grp Volume(v), veh/h	0	0	83	134	0	0				622	0	564
Grp Sat Flow(s),veh/h/ln	0	0	1552	1132	0	0				1716	0	1708
Q Serve(g_s), s	0.0	0.0	5.8	8.9	0.0	0.0				15.1	0.0	13.0
Cycle Q Clear(g_c), s	0.0	0.0	5.8	14.7	0.0	0.0				15.1	0.0	13.0
Prop In Lane	0.00		0.63	0.54		0.00				0.07		0.04
Lane Grp Cap(c), veh/h	0	0	239	215	0	0				1338	0	1332
V/C Ratio(X)	0.00	0.00	0.35	0.62	0.00	0.00				0.47	0.00	0.42
Avail Cap(c_a), veh/h	0	0	401	365	0	0				1338	0	1332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	45.5	50.4	0.0	0.0				4.6	0.0	4.4
Incr Delay (d2), s/veh	0.0	0.0	0.6	2.2	0.0	0.0				1.2	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.3	4.1	0.0	0.0				5.0	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	46.2	52.6	0.0	0.0				5.8	0.0	5.3
LnGrp LOS	A	A	D	D	A	A				A	A	A
Approach Vol, veh/h		83			134						1186	
Approach Delay, s/veh		46.2			52.6						5.6	
Approach LOS		D			D						A	

Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		97.5		22.5				22.5				
Change Period (Y+Rc), s		5.0		4.5				4.5				
Max Green Setting (Gmax), s		80.0		30.5				30.5				
Max Q Clear Time (g_c+I1), s		17.1		16.7				7.8				
Green Ext Time (p_c), s		26.3		0.5				0.3				

Intersection Summary			
HCM 6th Ctrl Delay			12.5
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	60	10	0	30	25	1110	10	10	1195	20
Future Vol, veh/h	15	0	60	10	0	30	25	1110	10	10	1195	20
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	17	0	67	11	0	33	28	1233	11	11	1328	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2057	2682	688	1989	2688	640	1363	0	0	1252	0	0
Stage 1	1374	1374	-	1303	1303	-	-	-	-	-	-	-
Stage 2	683	1308	-	686	1385	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	33	22	393	37	22	423	490	-	-	563	-	-
Stage 1	156	215	-	173	233	-	-	-	-	-	-	-
Stage 2	410	231	-	408	213	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	27	19	388	27	19	416	484	-	-	559	-	-
Mov Cap-2 Maneuver	27	19	-	27	19	-	-	-	-	-	-	-
Stage 1	145	196	-	162	218	-	-	-	-	-	-	-
Stage 2	352	216	-	311	194	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	110.6	79	0.3	0.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	484	-	-	106	90	559	-	-
HCM Lane V/C Ratio	0.057	-	-	0.786	0.494	0.02	-	-
HCM Control Delay (s)	12.9	-	-	110.6	79	11.6	0.4	-
HCM Lane LOS	B	-	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	4.3	2.1	0.1	-	-

Intersection	
Int Delay, s/veh	17.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Future Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	16	732	47	126	658	5	21	5	221	5	11	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	780	0	0	1729	1705	758	1816	1726	663
Stage 1	-	-	-	-	-	-	789	789	-	914	914	-
Stage 2	-	-	-	-	-	-	940	916	-	902	812	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	935	-	-	828	-	-	68	92	405	61	90	459
Stage 1	-	-	-	-	-	-	378	405	-	330	355	-
Stage 2	-	-	-	-	-	-	311	354	-	335	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	827	-	-	48	77	404	23	75	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	77	-	23	75	-
Stage 1	-	-	-	-	-	-	371	398	-	324	301	-
Stage 2	-	-	-	-	-	-	231	300	-	147	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	118.2	55.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	235	934	-	-	827	-	-	126
HCM Lane V/C Ratio	1.053	0.017	-	-	0.153	-	-	0.459
HCM Control Delay (s)	118.2	8.9	-	-	10.1	-	-	55.8
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	10.4	0.1	-	-	0.5	-	-	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Future Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	65	908	147	82	620	212	136	87	82	190	71	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	88	1396	226	112	866	711	377	233	219	327	291	176
Arrive On Green	0.06	0.50	0.48	0.07	0.51	0.51	0.28	0.29	0.29	0.28	0.29	0.28
Sat Flow, veh/h	1537	2821	457	1628	1709	1402	1270	813	767	1221	1017	616
Grp Volume(v), veh/h	65	527	528	82	620	212	136	0	169	190	0	114
Grp Sat Flow(s),veh/h/ln	1537	1637	1641	1628	1709	1402	1270	0	1580	1221	0	1633
Q Serve(g_s), s	3.3	19.2	19.3	4.0	22.5	7.0	7.4	0.0	6.8	11.9	0.0	4.3
Cycle Q Clear(g_c), s	3.3	19.2	19.3	4.0	22.5	7.0	11.7	0.0	6.8	18.7	0.0	4.3
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.49	1.00		0.38
Lane Grp Cap(c), veh/h	88	810	812	112	866	711	377	0	452	327	0	467
V/C Ratio(X)	0.74	0.65	0.65	0.73	0.72	0.30	0.36	0.00	0.37	0.58	0.00	0.24
Avail Cap(c_a), veh/h	154	1002	1004	224	1110	911	521	0	631	466	0	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.1	15.1	15.2	36.5	15.3	11.5	26.9	0.0	22.9	30.8	0.0	22.0
Incr Delay (d2), s/veh	8.6	3.4	3.4	6.6	4.3	0.9	0.4	0.0	0.4	1.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.2	7.3	1.7	8.9	2.2	2.3	0.0	2.5	3.6	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	18.5	18.6	43.1	19.6	12.4	27.3	0.0	23.2	32.4	0.0	22.3
LnGrp LOS	D	B	B	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h		1120			914			305			304	
Approach Delay, s/veh		20.1			20.0			25.0			28.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	43.6		26.9	8.6	44.6		26.9				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	10.5	48.0		31.5	7.5	51.0		31.5				
Max Q Clear Time (g_c+I1), s	6.0	21.3		20.7	5.3	24.5		13.7				
Green Ext Time (p_c), s	0.0	17.4		1.0	0.0	13.3		1.1				
Intersection Summary												
HCM 6th Ctrl Delay			21.6									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection												
Int Delay, s/veh	8.2											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Future Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	10	57	0	0	72	62	52	1356	26	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	824	1499	-	-	1486	706	2	0	0
Stage 1	2	2	-	-	1484	-	-	-	-
Stage 2	822	1497	-	-	2	-	-	-	-
Critical Hdwy	7.5	6.54	-	-	6.5	6.9	4.22	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.02	-	-	4	3.3	2.26	-	-
Pot Cap-1 Maneuver	269	121	0	0	126	383	1590	-	-
Stage 1	-	-	0	0	190	-	-	-	-
Stage 2	339	184	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	93	102	-	-	107	379	1587	-	-
Mov Cap-2 Maneuver	93	102	-	-	107	-	-	-	-
Stage 1	-	-	-	-	161	-	-	-	-
Stage 2	134	156	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	73	56.1	0.7
HCM LOS	F	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2
Capacity (veh/h)	1587	-	-	93	102	107	379
HCM Lane V/C Ratio	0.032	-	-	0.111	0.556	0.674	0.163
HCM Control Delay (s)	7.3	0.5	-	48.5	77.5	90.2	16.3
HCM Lane LOS	A	A	-	E	F	F	C
HCM 95th %tile Q(veh)	0.1	-	-	0.4	2.6	3.5	0.6

Intersection ID and Name	use dropdown NB PhasingType	use dropdown SB PhasingType	use dropdown EB PhasingType	use dropdown WB PhasingType	Cycle Length	Lost Time	BEGIN CALCULATIONS	1 EBL	3 EBT	4 EBR	5 WBL	6 WBT	7 WBR	8 NBL	9 NBT	10 NBR	11 SBL	12 SBT	13 SBR	14	Critical Flow Calculator WBL/EBT	EBL/WBT	NBL/SBT	SBL/NBT	V/S E/W	V/S N/S	Intersection V/C	HCM 6th Ctrl Delay	HCM 6th LOS	Synchro ID
2: US 101 & Lighthouse Dr/52nd St	Protected	Protected	Permitted	Permitted	125	12	Adj Flow Rate, veh/h	37	5	95	100	0	16	58	1137	0	32	895	0	Protected	0.26	0.01	0.56	0.70						
							Sat Flow, veh/h	0	19	1457	0	0	1468	1615	1682	1483	1667	1695	1483	Permitted or Split	0.26	0.01	0.53	0.68						
							V/S	0.00	0.26	0.07	0.00	0.00	0.01	0.04	0.68	0.00	0.02	0.53	0.00	selected phasing	0.26	0.01	0.56	0.70	0.26	0.70	**1.06**	**56.9**	**E**	2
7: US 101 & 11th St	Protected	Protected	Permitted	Permitted	120	12	Adj Flow Rate, veh/h	79	16	26	32	11	53	11	1579	16	16	1521	26	Protected	0.17	0.16	0.47	0.49						
							Sat Flow, veh/h	845	245	298	382	315	858	1667	3292	33	1667	3265	56	Permitted or Split	0.09	0.08	0.47	0.48						
							V/S	0.09	0.07	0.09	0.08	0.03	0.06	0.01	0.48	0.48	0.01	0.47	0.46	selected phasing	0.09	0.08	0.47	0.49	0.09	0.49	**0.65**	**5**	**A**	7
8: US 101 & 6th St	Protected	Protected	Split	Split	120	16	Adj Flow Rate, veh/h	100	39	33	83	22	39	39	1606	28	28	1556	33	Protected	0.19	0.19	0.51	0.51						
							Sat Flow, veh/h	954	372	315	932	247	438	1667	3265	57	1667	3225	68	Permitted or Split	0.10	0.09	0.49	0.49						
							V/S	0.10	0.10	0.10	0.09	0.09	0.09	0.02	0.49	0.49	0.02	0.48	0.49	selected phasing	0.10	0.09	0.51	0.51	0.19	0.51	**0.81**	**21**	**C**	8
9: US 101 & Olive St/US 20	Protected	Protected	Protected	Protected	120	16	Adj Flow Rate, veh/h	218	207	37	271	176	298	80	957	0	356	1037	85	Protected	0.32	0.34	0.39	0.52						
							Sat Flow, veh/h	1654	1424	255	1576	1723	1414	1667	3221	1367	1615	3032	248	Permitted or Split	0.15	0.21	0.34	0.30						
							V/S	0.13	0.15	0.15	0.17	0.10	0.21	0.05	0.30	0.00	0.22	0.34	0.34	selected phasing	0.32	0.34	0.39	0.52	0.34	0.52	**0.99**	**75.1**	**E**	9
11: US 101 & Hurbert St	Protected	Protected	Permitted	Permitted	120	12	Adj Flow Rate, veh/h	0	31	52	72	62	0	0	0	0	46	1119	21	Protected	0.19	0.10	0.35	0.36						
							Sat Flow, veh/h	0	579	972	522	610	0	0	0	0	127	3234	64	Permitted or Split	0.05	0.14	0.36	0.00						
							V/S	0.00	0.05	0.05	0.14	0.10	0.00	0.00	0.00	0.00	0.36	0.35	0.33	selected phasing	0.05	0.14	0.35	0.36	0.14	0.36	**0.56**	**12.5**	**B**	11
14: Moore Dr/Harney St & US 20	Permitted	Permitted	Protected	Protected	104	12	Adj Flow Rate, veh/h	65	908	147	82	620	212	136	87	82	190	71	43	Protected	0.37	0.41	0.18	0.26						
							Sat Flow, veh/h	1537	2821	457	1628	1709	1402	1270	813	767	1221	1017	616	Permitted or Split	0.32	0.36	0.16	0.11						
							V/S	0.04	0.32	0.32	0.05	0.36	0.15	0.11	0.11	0.11	0.16	0.07	0.07	selected phasing	0.37	0.41	0.16	0.11	0.41	0.16	**0.63**	**21.6**	**C**	14
1: US 101 & 73rd Ct/73rd St	Protected	Protected	Permitted	Permitted	90	12	Adj Flow Rate, veh/h	1	0	5	100	0	16	5	932	63	21	726	2	Protected	0.08	0.09	0.43	0.57						
							Sat Flow, veh/h	109	149	1288	1249	0	200	1667	1709	1043	770	1704	5	Permitted or Split	0.01	0.08	0.43	0.55						
							V/S	0.01	0.00	0.00	0.08	0.00	0.08	0.00	0.55	0.06	0.03	0.43	0.40	selected phasing	0.01	0.08	0.43	0.57	0.08	0.57	**0.75**	**9.9**	**A**	1
12: US 101 & Hurbert St	Protected	Protected	Permitted	Permitted	120	12	Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
							Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
							V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	12
6: US 101 & 20th St	Protected	Protected	Split	Split	120	16	Adj Flow Rate, veh/h	43	59	86	239	186	97	65	1425	124	86	1156	22	Protected	0.21	0.23	0.39	0.53						
							Sat Flow, veh/h	711	976	1416	1654	1081	564	1641	2998	259	1628	3259	62	Permitted or Split	0.06	0.17	0.35	0.48						
							V/S	0.06	0.06	0.06	0.14	0.17	0.17	0.04	0.48	0.48	0.05	0.35	0.35	selected phasing	0.06	0.17	0.39	0.53	0.23	0.53	**0.88**	**40.2**	**D**	6

Sheet Description:
This sheet reads in the adjusted flow rate and the saturation flow rate from Synchro and divides them to calculated the V/S for each movement.
The critical flow calculator calculates the critical v/s for each conflicting phase pair.
for protected phases, this v/s is the left turn v/s plus the max of the opposing movement v/s
for the permitted and split phases, this v/s is the max of the three movement v/s
The next step selects the proper v/s based on phasing provided
V/S by east-west and north-south is selected by taking the max of the phase pairs or by adding them (if split phasing)
If overlap calculator was selected in input section and overlap phases were indicated, then overlap v/s for intersection is calculated. See details below
If the right turn v/s is greater than the through v/s for the right turn overlap approach, then the right turn is assumed the critical movement and intersection v/c calc will use the v/s overlap instead of approach v/s
The final step in v/c calculation uses the approach v/s ratios, cycle length, and lost time to calculate overall intersection v/c
Delay and LOS are read directly from the HCM 6 report

Overlap Calculator Details
Overlap calculator reads in whether an overlap phase is in use and what type of phasing is associated with the right turn approach and the overlapped approach
V/S is read in for right turn movement, and remaining approaches from previous calculations
-right turn overlap v/s is just the v/s for the right turn movement (i.e. NBR)
-right turn approach v/s is the critical v/s associated with the right turn approaches (i.e. NB/SB) and is calculated differently for protected vs split
-overlap approach v/s is the critical v/s associated with the overlap approaches (i.e. EB/WB) and is calculated differently for protected vs split phasing
The v/s overlap column sums the 3 v/s values for the overlap phasing to get the total v/s overlap to be used in the v/c calculation
If there are overlaps for multiple approaches, the v/s overlap will use the greatest of the approaches for most conservative approach
Use Overlap Calculator' must be enabled and 'Use OV V/S' must be showing in V/S Overlap column in order for overlap v/s to be used in final v/c calculation

	use dropdown	BEGIN	Sat. Flow Default	1700	1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
Intersection ID and Name	Control Type	CALCULATIONS	Major Approach	Row Reference		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		NB	SB	EB	WB	Synchro ID
1: US 101 & 73rd Ct/73rd St	TWSC		#N/A	7														1: US 101 & 73rd Ct/73rd St V/C	0.00	0.00	0.00	0.00	1
				8														1: US 101 & 73rd Ct/73rd St Delay	0.00	0.00	0.00	0.00	
				19		0	0	0	0	0	0	0	0	0	0	0	0	1: US 101 & 73rd Ct/73rd St LOS	A	A	A	A	
					Major V/C Lanes	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C																		
					Minor (or AWSC) V/C																		
				45																			
				47																			
				48																			
				49																			
3: US 101 & Oceanview Dr	TWSC		NB/SB	7	Movement	EBL		EBR				NBL	NBT			SBT	SBR	3: US 101 & Oceanview Dr V/C	0.72	0.61	1.12	0.00	3
				8	Lane Configurations	1		0				1	1			1	1	3: US 101 & Oceanview Dr Delay	11.10	0.00	156.90	0.00	
				19	Mvmt Flow	138	0	64	0	0	0	21	1223	0	0	1032	59	3: US 101 & Oceanview Dr LOS	B	A	F	A	
				10	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C							0.04	0.72			0.61	0.03						
					Minor (or AWSC) V/C	1.12																	
				45	Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.04	-	1.12	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	11.1	-	156.9	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	F	-	-	0	0	0	0	0	0						
4: US 101 & 36th Street	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		4: US 101 & 36th Street V/C	0.68	0.62	0.00	0.24	4
				8	Lane Configurations				1		0		1	1	1	1		4: US 101 & 36th Street Delay	0.00	11.20	0.00	31.50	
				19	Mvmt Flow	0	0	0	27	0	16	0	1154	43	11	1059	0	4: US 101 & 36th Street LOS	A	B	A	D	
				70	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.68	0.03	0.02	0.62							
					Minor (or AWSC) V/C				0.24														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.24	0.02	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	31.5	11.2	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	D	B	-	0	0	0	0	0	0						
5: US 101 & 31st St	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		5: US 101 & 31st St V/C	0.71	0.64	0.00	0.30	5
				8	Lane Configurations				1		0		1	1	1	1		5: US 101 & 31st St Delay	0.00	12.00	0.00	36.80	
				19	Mvmt Flow	0	0	0	38	0	11	0	1212	98	22	1082	0	5: US 101 & 31st St LOS	A	B	A	E	
				127	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.71	0.06	0.04	0.64							
					Minor (or AWSC) V/C				0.30														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.30	0.04	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	36.8	12.0	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	E	B	-	0	0	0	0	0	0						
10: US 101 & Angle St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	10: US 101 & Angle St V/C	0.00	0.38	0.06	0.00	10
				8	Lane Configurations	0	1	0	0	0	2	0	0	0	0	2	0	10: US 101 & Angle St Delay	0.00	0.00	15.00	0.00	
				19	Mvmt Flow	0	0	22	0	0	1126	0	0	0	0	1258	49	10: US 101 & Angle St LOS	A	A	C	A	
				184	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.01	0.01			0.33					0.38	0.38						
					Minor (or AWSC) V/C	0.06																	
				45	Minor Lane/Major Mvmt	0	EBLn1	SBT	SBR	0	0	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.06	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	15.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	C	-	-	0	0	0	0	0	0	0	0						
12: US 101 & Bayley St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	12: US 101 & Bayley St V/C	0.37	0.41	0.79	0.49	12
				8	Lane Configurations	0	1	0	0	1	0	1	2	0	0	2	0	12: US 101 & Bayley St Delay	12.90	11.60	110.60	79.00	
				19	Mvmt Flow	17	0	67	11	0	33	28	1233	11	11	1328	22	12: US 101 & Bayley St LOS	B	B	F	F	
				241	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.04	0.04		0.02	0.02	0.06	0.37	0.37	0.41	0.40	0.40						
					Minor (or AWSC) V/C	0.79			0.49														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.06	-	-	0.79	0.49	0.02	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	12.9	-	-	110.6	79.0	11.6	0.4	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	-	F	F	B	A	-	0	0	0						
13: Benton St & US 20	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	13: Benton St & US 20 V/C	1.05	0.46	0.46	0.39	13
				8	Lane Configurations	1	1	0	1	1	0	0	1	0	0	1	0	13: Benton St & US 20 Delay	118.20	55.80	8.90	10.10	
				19	Mvmt Flow	16	732	47	126	658	5	21	5	221	5	11	42	13: Benton St & US 20 LOS	F	F	A	B	
				298	Major V/C Lanes	L	T or TR	TR or R	L	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.02	0.46	0.46	0.15	0.39	0.39		0.13	0.13		0.03	0.03						
					Minor (or AWSC) V/C							1.05			0.46								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	1.05	0.02	-	-	0.15	-	-	0.46	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	118.2	8.9	-	-	10.1	-	-	55.8	0.0	0.0	0.0						
				49	HCM Lane LOS	0	F	A	-	-	B	-	-	F	0	0	0						
15: Oceanview Dr & Pacific Pl/25th St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	15: Oceanview Dr & Pacific Pl/25th St V/C	0.15	0.08	0.00	0.27	15
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	15: Oceanview Dr & Pacific Pl/25th St Delay	0.00	7.80	0.00	12.30	

	use dropdown	BEGIN	Sat. Flow Default	1700	1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
Intersection ID and Name	**Control Type**	CALCULATIONS	**Major Approach**	**Row Reference**		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**NB**	**SB**	**EB**	**WB**	**Synchro ID**
				19	Mvmt Flow	0	0	0	99	0	86	0	136	123	25	111	0	15: Oceanview Dr & Pacific Pl/25th St LOS	A	A	A	B	
				355	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C		0.00	0.00		0.05	0.05		0.15	0.15	0.08	0.07	0.07						
					Minor (or AWSC) V/C	-			0.27														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	-	-	0.27	0.02	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	0.0	-	-	0.0	12.3	7.8	0.0	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	-	-	A	B	A	A	-	0	0	0						
16: Nye St & 11th St	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	16: Nye St & 11th St V/C	**0.26**	**0.14**	**0.03**	**0.04**	**16**
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	16: Nye St & 11th St Delay	**10.90**	**10.80**	**7.30**	**7.30**	
				19	Mvmt Flow	6	38	6	19	31	13	19	125	69	19	75	6	16: Nye St & 11th St LOS	**B**	**B**	**A**	**A**	
				412	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.03	0.03	0.03	0.04	0.03	0.03		0.11	0.11		0.05	0.05						
					Minor (or AWSC) V/C							0.26			0.14								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.26	0.00	-	-	0.01	-	-	0.14	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	10.9	7.3	0.0	-	7.3	0.0	-	10.8	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
17: Harney St & 7th St	AWSC		N/A	9	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	17: Harney St & 7th St V/C	**0.22**	**0.00**	**0.22**	**0.08**	**17**
				10	Lane Configurations	0	1	0	0	1	0	0	1	1	0	1	0	17: Harney St & 7th St Delay	**9.80**	**7.80**	**8.10**	**8.10**	
				15	Mvmt Flow	1	45	152	28	34	0	140	0	39	0	1	0	17: Harney St & 7th St LOS	**A**	**A**	**A**	**A**	
				471	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LT	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C		0.12	0.12		0.02	0.02		0.00	0.02		0.00	0.00						
					Minor (or AWSC) V/C	0.22			0.08			0.22	0.05		0.00								
				29	Lane	0	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	0	0	0	0	0	0						
				45	HCM Lane V/C Ratio	0.00	0.22	0.05	0.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
				46	HCM Control Delay	0.0	9.8	7.3	8.1	8.1	7.8	0.0	0.0	0.0	0.0	0.0	0.0						
				47	HCM Lane LOS	0	A	A	A	A	A	0	0	0	0	0	0						
18: 9th St & Hurbert St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	18: 9th St & Hurbert St V/C	**0.43**	**0.00**	**0.56**	**0.67**	**18**
				8	Lane Configurations	1	1	0	0	1	1	0	2	0	0	0	0	18: 9th St & Hurbert St Delay	**7.30**	**0.00**	**77.50**	**90.20**	
				19	Mvmt Flow	10	57	0	0	72	62	52	1356	26	0	0	0	18: 9th St & Hurbert St LOS	**A**	**A**	**F**	**F**	
				524	Major V/C Lanes	L	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.03	0.03		0.04	0.04	0.43	0.41	0.41									
					Minor (or AWSC) V/C	0.11	0.56		0.67	0.16													
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.03	-	-	0.11	0.56	0.67	0.16	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	7.3	0.5	-	48.5	77.5	90.2	16.3	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	A	-	E	F	F	C	0	0	0	0						
19: 9th St & Abbey St	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	19: 9th St & Abbey St V/C	**0.23**	**0.21**	**0.06**	**0.09**	**19**
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	19: 9th St & Abbey St Delay	**13.00**	**13.10**	**7.60**	**7.40**	
				19	Mvmt Flow	30	42	18	1	90	54	24	96	12	48	54	18	19: 9th St & Abbey St LOS	**B**	**B**	**A**	**A**	
				581	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.06	0.04	0.04	0.09	0.08	0.08		0.06	0.06		0.04	0.04						
					Minor (or AWSC) V/C							0.23			0.21								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.23	0.02	-	-	0.00	-	-	0.21	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	13.0	7.6	0.0	-	7.4	0.0	-	13.1	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
20: Bay Blvd & Moore Dr	TWSC		NB/SB	7	Movement	EBL		EBR				NBL	NBT			SBT	SBR	20: Bay Blvd & Moore Dr V/C	**0.11**	**0.10**	**0.33**	**0.00**	**20**
				8	Lane Configurations	1		0				1	1			1	1	20: Bay Blvd & Moore Dr Delay	**7.90**	**0.00**	**14.40**	**0.00**	
				19	Mvmt Flow	72	0	111	0	0	0	161	178	0	0	172	122	20: Bay Blvd & Moore Dr LOS	**A**	**A**	**B**	**A**	
				638	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C							0.11	0.10			0.10	0.07						
					Minor (or AWSC) V/C	0.33																	
				45	Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.11	-	0.33	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	7.9	-	14.4	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	-	B	-	-	0	0	0	0	0	0						

Sheet Description:

This sheet reads in lane configurations by representing exclusive through or shared lanes with the number of lanes in the through movement, and any exclusive number of turn lanes in the respective turn movement. So a single LTR lane would have 1 under through and 0s under left and right.

This sheet also reads in movement flow and select v/c, LOS, and delay results. The calculations are shown in the box.

Calculations are split out by major and minor approach v/c; Major approach is determined from free approaches in report

The major v/c lanes row indicates the left turn lane configuration for each approach. This is important to determine how to add in the delay from the left turns to the overall calculated v/c for the major approach

In the major v/c row, left turn v/c is read from the report, while remaining movement v/c ratios are calculated based on the methodology given in the ODOT APM and the provided default saturation flow rate of 1700 (can be changed by user)

In the minor v/c row, v/c ratios by lane are calculated based on the ODOT APM method using volume and assumed saturation flow rate

The v/c ratio by approach is the max of the v/c by lane as calculated in the major or minor v/c rows

LOS and Delay by approach are read in from the report

For AWSC, all approaches are treated as minor approaches and the calculations remain the same

The summary table selects the worst approach for both directions and concatenates the results with a / for the final summary table for TWSC. For AWSC, the overall worst approach is reported.

SECTION 2. HCM REPORTS

FINANCIALLY CONSTRAINED WITHOUT PEAKING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	5	95	0	15	5	885	60	20	690	2
Future Volume (veh/h)	1	0	5	95	0	15	5	885	60	20	690	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1654	1750	1750	1750	1709	1231	808	1709	1750
Adj Flow Rate, veh/h	1	0	5	95	0	15	5	885	60	20	690	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	7	0	0	0	3	38	69	3	0
Cap, veh/h	96	13	127	256	0	19	470	1059	646	230	1085	3
Arrive On Green	0.10	0.00	0.10	0.10	0.00	0.10	0.03	0.62	0.62	0.04	0.64	0.60
Sat Flow, veh/h	124	136	1297	1251	0	198	1667	1709	1043	770	1703	5
Grp Volume(v), veh/h	6	0	0	110	0	0	5	885	60	20	0	692
Grp Sat Flow(s),veh/h/ln	1557	0	0	1449	0	0	1667	1709	1043	770	0	1708
Q Serve(g_s), s	0.0	0.0	0.0	3.5	0.0	0.0	0.1	20.5	1.2	0.5	0.0	12.4
Cycle Q Clear(g_c), s	0.2	0.0	0.0	3.7	0.0	0.0	0.1	20.5	1.2	0.5	0.0	12.4
Prop In Lane	0.17		0.83	0.86		0.14	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	236	0	0	275	0	0	470	1059	646	230	0	1088
V/C Ratio(X)	0.03	0.00	0.00	0.40	0.00	0.00	0.01	0.84	0.09	0.09	0.00	0.64
Avail Cap(c_a), veh/h	648	0	0	679	0	0	625	1802	1100	288	0	1801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	0.0	22.1	0.0	0.0	4.9	7.6	3.9	7.8	0.0	5.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.9	0.0	0.0	0.0	1.8	0.1	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.3	0.0	0.0	0.0	2.9	0.1	0.0	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	0.0	0.0	23.1	0.0	0.0	4.9	9.4	3.9	8.0	0.0	6.2
LnGrp LOS	C	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		6			110			950			712	
Approach Delay, s/veh		20.6			23.1			9.0			6.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	35.1		8.9	5.3	36.0		8.9				
Change Period (Y+Rc), s	5.0	6.0		4.0	5.0	6.0		4.0				
Max Green Setting (Gmax), s	5.0	51.0		19.0	5.0	51.0		19.0				
Max Q Clear Time (g_c+I1), s	2.5	22.5		2.2	2.1	14.4		5.7				
Green Ext Time (p_c), s	0.0	6.6		0.0	0.0	4.5		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			8.8									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	5	90	95	0	15	55	1080	120	30	850	30
Future Volume (veh/h)	35	5	90	95	0	15	55	1080	120	30	850	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1736	1750	1750	1750	1695	1682	1750	1750	1695	1750
Adj Flow Rate, veh/h	35	5	90	95	0	15	55	1080	0	30	850	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	0	4	5	0	0	4	0
Cap, veh/h	56	4	294	59	0	296	75	1125		51	1107	
Arrive On Green	0.20	0.20	0.20	0.20	0.00	0.20	0.05	0.67	0.00	0.03	0.65	0.00
Sat Flow, veh/h	0	21	1457	0	0	1468	1615	1682	1483	1667	1695	1483
Grp Volume(v), veh/h	40	0	90	95	0	15	55	1080	0	30	850	0
Grp Sat Flow(s),veh/h/ln	21	0	1457	0	0	1468	1615	1682	1483	1667	1695	1483
Q Serve(g_s), s	0.0	0.0	6.4	0.0	0.0	1.0	4.1	72.1	0.0	2.2	42.4	0.0
Cycle Q Clear(g_c), s	24.0	0.0	6.4	24.0	0.0	1.0	4.1	72.1	0.0	2.2	42.4	0.0
Prop In Lane	0.87		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	0	294	59	0	296	75	1125		51	1107	
V/C Ratio(X)	0.67	0.00	0.31	1.60	0.00	0.05	0.73	0.96		0.59	0.77	
Avail Cap(c_a), veh/h	60	0	294	59	0	296	80	1143		82	1152	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.0	0.0	41.2	60.5	0.0	39.1	57.1	18.6	0.0	58.1	14.7	0.0
Incr Delay (d2), s/veh	23.5	0.0	0.4	336.0	0.0	0.1	26.1	18.0	0.0	8.0	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.4	7.4	0.0	0.4	2.2	28.5	0.0	1.0	15.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.5	0.0	41.7	396.5	0.0	39.1	83.2	36.5	0.0	66.1	18.3	0.0
LnGrp LOS	F	A	D	F	A	D	F	D		E	B	
Approach Vol, veh/h		130			110			1135	A		880	A
Approach Delay, s/veh		53.9			347.7			38.8			19.9	
Approach LOS		D			F			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	83.3		28.5	7.7	85.2		28.5				
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5				
Max Green Setting (Gmax), s	5.5	80.5		24.0	5.5	80.5		24.0				
Max Q Clear Time (g_c+I1), s	6.1	44.4		26.0	4.2	74.1		26.0				
Green Ext Time (p_c), s	0.0	13.4		0.0	0.0	5.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			47.4
HCM 6th LOS			D

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	60	20	1150	970	55
Future Vol, veh/h	130	60	20	1150	970	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	300	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	11	5	4	4
Mvmt Flow	130	60	20	1150	970	55

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2160	970	1025	0	-	0
Stage 1	970	-	-	-	-	-
Stage 2	1190	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.299	-	-	-
Pot Cap-1 Maneuver	~ 53	310	644	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 51	310	644	-	-	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	359	-	-	-	-	-
Stage 2	291	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	103.2	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	644	-	198	-	-
HCM Lane V/C Ratio	0.031	-	0.96	-	-
HCM Control Delay (s)	10.8	-	103.2	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	0.6					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	15	1085	40	10	995
Future Vol, veh/h	25	15	1085	40	10	995
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	125	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	31	4	0	0	3
Mvmt Flow	25	15	1085	40	10	995

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2100	1085	0	0	1125	0
Stage 1	1085	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Critical Hdwy	6.4	6.51	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.579	-	-	2.2	-
Pot Cap-1 Maneuver	58	231	-	-	628	-
Stage 1	327	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	57	231	-	-	628	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	327	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	196	628	-
HCM Lane V/C Ratio	-	-	0.204	0.016	-
HCM Control Delay (s)	-	-	28	10.8	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.7	0	-

Intersection						
Int Delay, s/veh	0.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	10	1115	90	20	995
Future Vol, veh/h	35	10	1115	90	20	995
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	50	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	14	5	0	0	3
Mvmt Flow	35	10	1115	90	20	995

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2150	1115	0	0	1205	0
Stage 1	1115	-	-	-	-	-
Stage 2	1035	-	-	-	-	-
Critical Hdwy	6.4	6.34	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.426	-	-	2.2	-
Pot Cap-1 Maneuver	54	239	-	-	586	-
Stage 1	316	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	52	239	-	-	586	-
Mov Cap-2 Maneuver	172	-	-	-	-	-
Stage 1	316	-	-	-	-	-
Stage 2	333	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	183	586	-
HCM Lane V/C Ratio	-	-	0.246	0.034	-
HCM Control Delay (s)	-	-	31	11.4	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	55	80	325	30	90	60	1325	115	80	1075	20
Future Volume (veh/h)	40	55	80	325	30	90	60	1325	115	80	1075	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1723	1695	1736	1750	1723	1723	1695	1750	1709	1709	1750
Adj Flow Rate, veh/h	40	55	80	222	173	90	60	1325	115	80	1075	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	4	1	0	2	2	4	0	3	3	0
Cap, veh/h	56	77	111	307	200	104	82	1657	143	81	1803	34
Arrive On Green	0.07	0.08	0.08	0.19	0.19	0.18	0.05	0.55	0.54	0.05	0.55	0.54
Sat Flow, veh/h	710	977	1415	1654	1082	563	1641	2998	259	1628	3261	61
Grp Volume(v), veh/h	95	0	80	222	0	263	60	710	730	80	535	560
Grp Sat Flow(s),veh/h/ln	1687	0	1415	1654	0	1644	1641	1611	1647	1628	1624	1698
Q Serve(g_s), s	6.6	0.0	6.6	15.2	0.0	18.6	4.3	42.3	42.8	5.9	26.4	26.4
Cycle Q Clear(g_c), s	6.6	0.0	6.6	15.2	0.0	18.6	4.3	42.3	42.8	5.9	26.4	26.4
Prop In Lane	0.42		1.00	1.00		0.34	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	133	0	111	307	0	305	82	890	910	81	898	939
V/C Ratio(X)	0.72	0.00	0.72	0.72	0.00	0.86	0.73	0.80	0.80	0.98	0.60	0.60
Avail Cap(c_a), veh/h	169	0	141	358	0	356	82	890	910	81	898	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.1	0.0	54.0	46.0	0.0	47.5	56.2	21.5	21.6	56.9	17.9	17.9
Incr Delay (d2), s/veh	8.5	0.0	10.3	5.3	0.0	16.5	21.6	5.7	5.7	93.7	2.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	2.7	6.7	0.0	9.1	2.3	16.4	17.0	4.5	10.2	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.6	0.0	64.3	51.3	0.0	63.9	77.8	27.1	27.4	150.7	20.8	20.7
LnGrp LOS	E	A	E	D	A	E	E	C	C	F	C	C
Approach Vol, veh/h		175			485			1500			1175	
Approach Delay, s/veh		63.4			58.2			29.3			29.6	
Approach LOS		E			E			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	70.4		26.2	10.0	70.3		13.4				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	5.5	59.0		25.5	5.5	59.0		11.5				
Max Q Clear Time (g_c+I1), s	6.3	28.4		20.6	7.9	44.8		8.6				
Green Ext Time (p_c), s	0.0	16.0		0.9	0.0	11.7		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	15	25	30	10	50	10	1500	15	15	1445	25
Future Volume (veh/h)	75	15	25	30	10	50	10	1500	15	15	1445	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1695	1750	1750	1750	1709	1750	1750	1709	1750
Adj Flow Rate, veh/h	75	15	25	30	10	50	10	1500	15	15	1445	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	4	0	0	0	3	0	0	3	0
Cap, veh/h	143	27	34	82	34	95	23	2547	25	29	2537	44
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.03	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	859	248	307	381	313	868	1667	3293	33	1667	3264	56
Grp Volume(v), veh/h	115	0	0	90	0	0	10	739	776	15	718	752
Grp Sat Flow(s),veh/h/ln	1414	0	0	1562	0	0	1667	1624	1702	1667	1624	1697
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.0	6.4	0.0	0.0	0.7	0.0	0.0	1.1	0.0	0.0
Prop In Lane	0.65		0.22	0.33		0.56	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	198	0	0	204	0	0	23	1256	1316	29	1262	1319
V/C Ratio(X)	0.58	0.00	0.00	0.44	0.00	0.00	0.44	0.59	0.59	0.52	0.57	0.57
Avail Cap(c_a), veh/h	339	0	0	350	0	0	83	1256	1316	83	1262	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.57	0.57	0.57	0.73	0.73	0.73
Uniform Delay (d), s/veh	52.0	0.0	0.0	50.7	0.0	0.0	57.9	0.0	0.0	57.4	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	1.1	0.0	0.0	5.6	1.2	1.1	7.7	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	2.7	0.0	0.0	0.3	0.4	0.4	0.5	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	0.0	0.0	51.8	0.0	0.0	63.5	1.2	1.1	65.1	1.4	1.3
LnGrp LOS	D	A	A	D	A	A	E	A	A	E	A	A
Approach Vol, veh/h		115			90			1525			1485	
Approach Delay, s/veh		54.0			51.8			1.5			2.0	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	97.2		17.1	6.1	96.8		17.1
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5
Max Green Setting (Gmax), s	5.5	76.0		24.5	5.5	76.0		24.5
Max Q Clear Time (g_c+I1), s	2.7	2.0		8.4	3.1	2.0		11.5
Green Ext Time (p_c), s	0.0	48.3		0.3	0.0	50.4		0.4

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	35	30	75	20	35	35	1445	25	25	1400	30
Future Volume (veh/h)	90	35	30	75	20	35	35	1445	25	25	1400	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1750	1654	1750	1750	1709	1750	1709	1750	1750	1695	1750
Adj Flow Rate, veh/h	90	35	30	75	20	35	35	1445	25	25	1400	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	0	7	0	0	3	0	3	0	0	4	0
Cap, veh/h	120	47	40	105	28	49	50	1963	34	38	1915	41
Arrive On Green	0.11	0.13	0.11	0.10	0.11	0.10	0.03	0.60	0.58	0.05	1.00	1.00
Sat Flow, veh/h	952	370	317	933	249	435	1667	3265	56	1667	3224	69
Grp Volume(v), veh/h	155	0	0	130	0	0	35	718	752	25	699	731
Grp Sat Flow(s),veh/h/ln	1640	0	0	1617	0	0	1667	1624	1698	1667	1611	1682
Q Serve(g_s), s	11.0	0.0	0.0	9.4	0.0	0.0	2.5	37.9	38.1	1.8	0.0	0.0
Cycle Q Clear(g_c), s	11.0	0.0	0.0	9.4	0.0	0.0	2.5	37.9	38.1	1.8	0.0	0.0
Prop In Lane	0.58		0.19	0.58		0.27	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	206	0	0	182	0	0	50	976	1021	38	957	999
V/C Ratio(X)	0.75	0.00	0.00	0.71	0.00	0.00	0.70	0.74	0.74	0.65	0.73	0.73
Avail Cap(c_a), veh/h	219	0	0	216	0	0	83	976	1021	83	957	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.50	0.50	0.50	0.79	0.79	0.79
Uniform Delay (d), s/veh	51.4	0.0	0.0	52.2	0.0	0.0	57.7	17.1	17.2	56.8	0.0	0.0
Incr Delay (d2), s/veh	12.2	0.0	0.0	7.7	0.0	0.0	6.4	2.5	2.4	10.4	3.9	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	0.0	4.3	0.0	0.0	1.1	13.8	14.5	0.8	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.7	0.0	0.0	59.9	0.0	0.0	64.1	19.6	19.6	67.2	3.9	3.8
LnGrp LOS	E	A	A	E	A	A	E	B	B	E	A	A
Approach Vol, veh/h		155			130			1505			1455	
Approach Delay, s/veh		63.7			59.9			20.6			4.9	
Approach LOS		E			E			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	75.8		17.5	6.8	76.6		19.1				
Change Period (Y+Rc), s	4.5	6.5		6.0	4.5	6.5		6.0				
Max Green Setting (Gmax), s	5.5	63.5		14.0	5.5	63.5		14.0				
Max Q Clear Time (g_c+I1), s	4.5	2.0		11.4	3.8	40.1		13.0				
Green Ext Time (p_c), s	0.0	26.5		0.1	0.0	20.2		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			17.2
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Future Volume (veh/h)	205	195	35	255	165	280	75	900	215	335	975	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1695	1654	1723	1723	1750	1695	1614	1695	1709	1709
Adj Flow Rate, veh/h	205	195	35	255	165	280	75	900	0	335	975	80
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	4	7	2	2	0	4	10	4	3	3
Cap, veh/h	238	238	43	284	351	288	100	1162		256	1392	114
Arrive On Green	0.14	0.17	0.16	0.18	0.20	0.20	0.06	0.36	0.00	0.05	0.15	0.15
Sat Flow, veh/h	1654	1422	255	1576	1723	1413	1667	3221	1367	1615	3032	249
Grp Volume(v), veh/h	205	0	230	255	165	280	75	900	0	335	522	533
Grp Sat Flow(s),veh/h/ln	1654	0	1678	1576	1723	1413	1667	1611	1367	1615	1624	1657
Q Serve(g_s), s	14.5	0.0	15.9	19.0	10.1	23.6	5.3	29.7	0.0	19.0	36.6	36.6
Cycle Q Clear(g_c), s	14.5	0.0	15.9	19.0	10.1	23.6	5.3	29.7	0.0	19.0	36.6	36.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	238	0	281	284	351	288	100	1162		256	745	761
V/C Ratio(X)	0.86	0.00	0.82	0.90	0.47	0.97	0.75	0.77		1.31	0.70	0.70
Avail Cap(c_a), veh/h	317	0	322	302	351	288	111	1162		256	745	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.59	0.59	0.59
Uniform Delay (d), s/veh	50.2	0.0	48.2	48.1	42.1	47.4	55.5	34.0	0.0	56.9	43.1	43.1
Incr Delay (d2), s/veh	15.4	0.0	13.0	26.4	1.0	45.4	20.5	5.1	0.0	155.4	3.3	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	7.7	9.5	4.4	12.0	2.8	12.5	0.0	19.3	16.7	17.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	0.0	61.2	74.6	43.0	92.9	76.0	39.1	0.0	212.3	46.3	46.3
LnGrp LOS	E	A	E	E	D	F	E	D		F	D	D
Approach Vol, veh/h		435			700			975	A		1390	
Approach Delay, s/veh		63.3			74.5			41.9			86.3	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	59.1	21.3	28.4	23.0	47.3	25.6	24.1
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5
Max Green Setting (Gmax), s	7.5	49.0	22.5	22.5	18.5	38.0	22.5	22.5
Max Q Clear Time (g_c+I1), s	7.3	38.6	16.5	25.6	21.0	31.7	21.0	17.9
Green Ext Time (p_c), s	0.0	7.3	0.2	0.0	0.0	4.4	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	68.7
HCM 6th LOS	E

Notes
User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	20	0	0	1025	0	0	0	0	1145	45
Future Vol, veh/h	0	0	20	0	0	1025	0	0	0	0	1145	45
Conflicting Peds, #/hr	0	0	17	17	0	0	22	0	11	11	0	22
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	16979	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	14	0	2	0	4	0	4	2	2
Mvmt Flow	0	0	20	0	0	1025	0	0	0	0	1145	45

Major/Minor	Minor2									Major2		
Conflicting Flow All	1190	1190	634							-	-	0
Stage 1	1190	1190	-							-	-	-
Stage 2	0	0	-							-	-	-
Critical Hdwy	6.8	6.5	6.9							-	-	-
Critical Hdwy Stg 1	5.8	5.5	-							-	-	-
Critical Hdwy Stg 2	-	-	-							-	-	-
Follow-up Hdwy	3.5	4	3.3							-	-	-
Pot Cap-1 Maneuver	183	189	427							0	-	-
Stage 1	255	263	-							0	-	-
Stage 2	-	-	-							0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	175	0	418							-	-	-
Mov Cap-2 Maneuver	175	0	-							-	-	-
Stage 1	250	0	-							-	-	-
Stage 2	-	0	-							-	-	-

Approach	EB	SB
HCM Control Delay, s	14	0
HCM LOS	B	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	418	-	-
HCM Lane V/C Ratio	0.048	-	-
HCM Control Delay (s)	14	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	30	50	70	60	0	0	0	0	45	1085	20
Future Volume (veh/h)	0	30	50	70	60	0	0	0	0	45	1085	20
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	0.98		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1750	1750	1709	1682	0				1750	1723	1750
Adj Flow Rate, veh/h	0	30	50	70	60	0				45	1085	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	3	5	0				0	2	0
Cap, veh/h	0	88	146	125	93	0				100	2532	49
Arrive On Green	0.00	0.15	0.15	0.15	0.15	0.00				0.77	0.78	0.77
Sat Flow, veh/h	0	582	970	527	615	0				128	3234	63
Grp Volume(v), veh/h	0	0	80	130	0	0				603	0	547
Grp Sat Flow(s),veh/h/ln	0	0	1552	1142	0	0				1716	0	1708
Q Serve(g_s), s	0.0	0.0	5.6	8.6	0.0	0.0				14.2	0.0	12.3
Cycle Q Clear(g_c), s	0.0	0.0	5.6	14.1	0.0	0.0				14.2	0.0	12.3
Prop In Lane	0.00		0.62	0.54		0.00				0.07		0.04
Lane Grp Cap(c), veh/h	0	0	234	213	0	0				1344	0	1337
V/C Ratio(X)	0.00	0.00	0.34	0.61	0.00	0.00				0.45	0.00	0.41
Avail Cap(c_a), veh/h	0	0	401	367	0	0				1344	0	1337
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	45.8	50.5	0.0	0.0				4.4	0.0	4.2
Incr Delay (d2), s/veh	0.0	0.0	0.6	2.1	0.0	0.0				1.1	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.2	4.0	0.0	0.0				4.7	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	46.4	52.6	0.0	0.0				5.5	0.0	5.1
LnGrp LOS	A	A	D	D	A	A				A	A	A
Approach Vol, veh/h		80			130						1150	
Approach Delay, s/veh		46.4			52.6						5.3	
Approach LOS		D			D						A	
Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		97.9		22.1				22.1				
Change Period (Y+Rc), s		5.0		4.5				4.5				
Max Green Setting (Gmax), s		80.0		30.5				30.5				
Max Q Clear Time (g_c+I1), s		16.2		16.1				7.6				
Green Ext Time (p_c), s		25.1		0.5				0.3				
Intersection Summary												
HCM 6th Ctrl Delay			12.2									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection												
Int Delay, s/veh	2.7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	60	10	0	30	25	1110	10	10	1195	20
Future Vol, veh/h	15	0	60	10	0	30	25	1110	10	10	1195	20
Conflicting Peds, #/hr	10	0	0	0	0	10	13	0	8	8	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	4	3	0	0	2	0
Mvmt Flow	15	0	60	10	0	30	25	1110	10	10	1195	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1853	2416	621	1791	2421	578	1228	0	0	1128	0	0
Stage 1	1238	1238	-	1173	1173	-	-	-	-	-	-	-
Stage 2	615	1178	-	618	1248	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.24	-	-	2.2	-	-
Pot Cap-1 Maneuver	47	33	435	52	33	464	552	-	-	627	-	-
Stage 1	189	250	-	207	268	-	-	-	-	-	-	-
Stage 2	450	267	-	448	247	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	40	29	430	41	29	456	545	-	-	622	-	-
Mov Cap-2 Maneuver	40	29	-	41	29	-	-	-	-	-	-	-
Stage 1	178	235	-	196	254	-	-	-	-	-	-	-
Stage 2	397	253	-	366	232	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	53.2	45	0.3	0.4
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	545	-	-	146	129	622	-	-
HCM Lane V/C Ratio	0.046	-	-	0.514	0.31	0.016	-	-
HCM Control Delay (s)	11.9	-	-	53.2	45	10.9	0.3	-
HCM Lane LOS	B	-	-	F	E	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	1.2	0	-	-

Intersection	
Int Delay, s/veh	11.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Future Vol, veh/h	15	695	45	120	625	5	20	5	210	5	10	40
Conflicting Peds, #/hr	1	0	1	1	0	1	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	6	5	4	4	0	6	0	3	0	0	3
Mvmt Flow	15	695	45	120	625	5	20	5	210	5	10	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	631	0	0	741	0	0	1643	1620	720	1725	1640	630
Stage 1	-	-	-	-	-	-	749	749	-	869	869	-
Stage 2	-	-	-	-	-	-	894	871	-	856	771	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.16	6.5	6.23	7.1	6.5	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.554	4	3.327	3.5	4	3.327
Pot Cap-1 Maneuver	961	-	-	857	-	-	78	104	426	71	101	480
Stage 1	-	-	-	-	-	-	398	422	-	349	372	-
Stage 2	-	-	-	-	-	-	330	371	-	355	413	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	960	-	-	856	-	-	57	88	425	30	85	479
Mov Cap-2 Maneuver	-	-	-	-	-	-	57	88	-	30	85	-
Stage 1	-	-	-	-	-	-	391	415	-	343	320	-
Stage 2	-	-	-	-	-	-	252	319	-	174	406	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	74.4	42.3
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	261	960	-	-	856	-	-	150
HCM Lane V/C Ratio	0.9	0.016	-	-	0.14	-	-	0.367
HCM Control Delay (s)	74.4	8.8	-	-	9.9	-	-	42.3
HCM Lane LOS	F	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	7.9	0	-	-	0.5	-	-	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Future Volume (veh/h)	60	835	135	75	570	195	125	80	75	175	65	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1723	1723	1709	1709	1654	1723	1723	1695	1736	1750	1750
Adj Flow Rate, veh/h	60	835	135	75	570	195	125	80	75	175	65	40
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	10	2	2	3	3	7	2	2	4	1	0	0
Cap, veh/h	85	1399	226	104	862	707	378	224	210	333	277	170
Arrive On Green	0.06	0.50	0.48	0.06	0.50	0.50	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1537	2821	456	1628	1709	1402	1280	816	765	1237	1010	621
Grp Volume(v), veh/h	60	484	486	75	570	195	125	0	155	175	0	105
Grp Sat Flow(s),veh/h/ln	1537	1637	1641	1628	1709	1402	1280	0	1580	1237	0	1631
Q Serve(g_s), s	2.8	15.3	15.4	3.3	17.9	5.8	6.1	0.0	5.7	9.7	0.0	3.6
Cycle Q Clear(g_c), s	2.8	15.3	15.4	3.3	17.9	5.8	9.8	0.0	5.7	15.4	0.0	3.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.48	1.00		0.38
Lane Grp Cap(c), veh/h	85	811	813	104	862	707	378	0	433	333	0	447
V/C Ratio(X)	0.71	0.60	0.60	0.72	0.66	0.28	0.33	0.00	0.36	0.53	0.00	0.23
Avail Cap(c_a), veh/h	170	1108	1111	247	1228	1008	593	0	699	540	0	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.6	13.1	13.2	33.2	13.3	10.3	24.6	0.0	21.1	27.8	0.0	20.4
Incr Delay (d2), s/veh	7.7	2.7	2.7	6.7	3.3	0.8	0.4	0.0	0.4	1.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.6	5.6	1.4	6.8	1.8	1.8	0.0	2.1	2.9	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	15.8	15.9	39.9	16.6	11.1	24.9	0.0	21.5	29.0	0.0	20.7
LnGrp LOS	D	B	B	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h		1030			840			280			280	
Approach Delay, s/veh		17.3			17.4			23.0			25.9	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	39.9		23.8	8.0	40.5		23.8				
Change Period (Y+Rc), s	4.5	5.0		4.5	4.5	5.0		4.5				
Max Green Setting (Gmax), s	10.5	48.0		31.5	7.5	51.0		31.5				
Max Q Clear Time (g_c+I1), s	5.3	17.4		17.4	4.8	19.9		11.8				
Green Ext Time (p_c), s	0.0	17.5		1.0	0.0	13.2		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			19.0									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Future Vol, veh/h	10	55	0	0	70	60	50	1315	25	0	0	0
Conflicting Peds, #/hr	4	0	15	15	0	4	2	0	11	11	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	2	0	0	0	0	6	2	23	0	6	0
Mvmt Flow	10	55	0	0	70	60	50	1315	25	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	799	1453	-	-	1441	685	2	0	0
Stage 1	2	2	-	-	1439	-	-	-	-
Stage 2	797	1451	-	-	2	-	-	-	-
Critical Hdwy	7.5	6.54	-	-	6.5	6.9	4.22	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.02	-	-	4	3.3	2.26	-	-
Pot Cap-1 Maneuver	280	129	0	0	134	395	1590	-	-
Stage 1	-	-	0	0	200	-	-	-	-
Stage 2	351	194	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	113	112	-	-	116	391	1587	-	-
Mov Cap-2 Maneuver	113	112	-	-	116	-	-	-	-
Stage 1	-	-	-	-	173	-	-	-	-
Stage 2	155	168	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	61	47.6	0.6
HCM LOS	F	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2
Capacity (veh/h)	1587	-	-	113	112	116	391
HCM Lane V/C Ratio	0.032	-	-	0.088	0.491	0.603	0.153
HCM Control Delay (s)	7.3	0.4	-	39.9	64.8	74.8	15.9
HCM Lane LOS	A	A	-	E	F	F	C
HCM 95th %tile Q(veh)	0.1	-	-	0.3	2.2	3	0.5

	use dropdown	use dropdown	use dropdown	use dropdown			BEGIN	1	3	4	5	6	7	8	9	10	11	12	13	14		Critical Flow Calculator									
Intersection ID and Name	**NB PhasingType**	**SB PhasingType**	**EB PhasingType**	**WB PhasingType**	**Cycle Length**	**Lost Time**	CALCULATIONS		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**WBL/EBT**	**EBL/WBT**	**NBL/SBT**	**SBL/NBT**	**V/S E/W**	**V/S N/S**	**Intersection V/C**	**HCM 6th Ctrl Delay**	**HCM 6th LOS**	**Synchro ID**
2: US 101 & Lighthouse Dr/52nd St	Protected	Protected	Permitted	Permitted	125	12		Adj Flow Rate, veh/h	35	5	90	95	0	15	55	1080	0	30	850	0	Protected	0.24	0.01	0.54	0.66						
								Sat Flow, veh/h	0	21	1457	0	0	1468	1615	1682	1483	1667	1695	1483	Permitted or Split	0.24	0.01	0.50	0.64						
								V/S	0.00	0.24	0.06	0.00	0.00	0.01	0.03	0.64	0.00	0.02	0.50	0.00	selected phasing	0.24	0.01	0.54	0.66	0.24	0.66	**0.99**	**47.4**	**D**	2
7: US 101 & 11th St	Protected	Protected	Permitted	Permitted	120	12		Adj Flow Rate, veh/h	75	15	25	30	10	50	10	1500	15	15	1445	25	Protected	0.16	0.14	0.45	0.46						
								Sat Flow, veh/h	859	248	307	381	313	868	1667	3293	33	1667	3264	56	Permitted or Split	0.09	0.08	0.45	0.46						
								V/S	0.09	0.06	0.08	0.08	0.03	0.06	0.01	0.46	0.45	0.01	0.44	0.45	selected phasing	0.09	0.08	0.45	0.46	0.09	0.46	**0.61**	**5**	**A**	7
8: US 101 & 6th St	Protected	Protected	Split	Split	120	16		Adj Flow Rate, veh/h	90	35	30	75	20	35	35	1445	25	25	1400	30	Protected	0.18	0.17	0.46	0.46						
								Sat Flow, veh/h	952	370	317	933	249	435	1667	3265	56	1667	3224	69	Permitted or Split	0.09	0.08	0.43	0.45						
								V/S	0.09	0.09	0.09	0.08	0.08	0.08	0.02	0.44	0.45	0.01	0.43	0.43	selected phasing	0.09	0.08	0.46	0.46	0.18	0.46	**0.73**	**17.2**	**B**	8
9: US 101 & Olive St/US 20	Protected	Protected	Protected	Protected	120	16		Adj Flow Rate, veh/h	205	195	35	255	165	280	75	900	0	335	975	80	Protected	0.30	0.32	0.37	0.49						
								Sat Flow, veh/h	1654	1422	255	1576	1723	1413	1667	3221	1367	1615	3032	249	Permitted or Split	0.14	0.20	0.32	0.28						
								V/S	0.12	0.14	0.14	0.16	0.10	0.20	0.04	0.28	0.00	0.21	0.32	0.32	selected phasing	0.30	0.32	0.37	0.49	0.32	0.49	**0.93**	**68.7**	**E**	9
11: US 101 & Hurbert St	Protected	Protected	Permitted	Permitted	120	12		Adj Flow Rate, veh/h	0	30	50	70	60	0	0	0	0	45	1085	20	Protected	0.18	0.10	0.34	0.35						
								Sat Flow, veh/h	0	582	970	527	615	0	0	0	0	128	3234	63	Permitted or Split	0.05	0.13	0.35	0.00						
								V/S	0.00	0.05	0.05	0.13	0.10	0.00	0.00	0.00	0.00	0.35	0.34	0.32	selected phasing	0.05	0.13	0.34	0.35	0.13	0.35	**0.54**	**12.2**	**B**	11
14: Moore Dr/Harney St & US 20	Permitted	Permitted	Protected	Protected	104	12		Adj Flow Rate, veh/h	60	835	135	75	570	195	125	80	75	175	65	40	Protected	0.34	0.37	0.16	0.24						
								Sat Flow, veh/h	1537	2821	456	1628	1709	1402	1280	816	765	1237	1010	621	Permitted or Split	0.30	0.33	0.14	0.10						
								V/S	0.04	0.30	0.30	0.05	0.33	0.14	0.10	0.10	0.10	0.14	0.06	0.06	selected phasing	0.34	0.37	0.14	0.10	0.37	0.14	**0.58**	**19**	**B**	14
1: US 101 & 73rd Ct/73rd St	Protected	Protected	Permitted	Permitted	90	12		Adj Flow Rate, veh/h	1	0	5	95	0	15	5	885	60	20	690	2	Protected	0.08	0.08	0.41	0.54						
								Sat Flow, veh/h	124	136	1297	1251	0	198	1667	1709	1043	770	1703	5	Permitted or Split	0.01	0.08	0.41	0.52						
								V/S	0.01	0.00	0.00	0.08	0.00	0.08	0.00	0.52	0.06	0.03	0.41	0.40	selected phasing	0.01	0.08	0.41	0.54	0.08	0.54	**0.72**	**8.8**	**A**	1
12: US 101 & Hurbert St	Protected	Protected	Permitted	Permitted	120	12		Adj Flow Rate, veh/h													Protected	0.00	0.00	0.00	0.00						
								Sat Flow, veh/h													Permitted or Split	0.00	0.00	0.00	0.00						
								V/S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	selected phasing	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0**	**A**	12
6: US 101 & 20th St	Protected	Protected	Split	Split	120	16		Adj Flow Rate, veh/h	40	55	80	222	173	90	60	1325	115	80	1075	20	Protected	0.19	0.22	0.37	0.49						
								Sat Flow, veh/h	710	977	1415	1654	1082	563	1641	2998	259	1628	3261	61	Permitted or Split	0.06	0.16	0.33	0.44						
								V/S	0.06	0.06	0.06	0.13	0.16	0.16	0.04	0.44	0.44	0.05	0.33	0.33	selected phasing	0.06	0.16	0.37	0.49	0.22	0.49	**0.82**	**35.4**	**D**	6

Sheet Description:
This sheet reads in the adjusted flow rate and the saturation flow rate from Synchro and divides them to calculated the V/S for each movement.
The critical flow calculator calculates the critical v/s for each conflicting phase pair.
for protected phases, this v/s is the left turn v/s plus the max of the opposing movement v/s
for the permitted and split phases, this v/s is the max of the three movement v/s
The next step selects the proper v/s based on phasing provided
V/S by east-west and north-south is selected by taking the max of the phase pairs or by adding them (if split phasing)
If overlap calculator was selected in input section and overlap phases were indicated, then overlap v/s for intersection is calculated. See details below
If the right turn v/s is greater than the through v/s for the right turn overlap approach, then the right turn is assumed the critical movement and intersection v/c calc will use the v/s overlap instead of approach v/s
The final step in v/c calculation uses the approach v/s ratios, cycle length, and lost time to calculate overall intersection v/c
Delay and LOS are read directly from the HCM 6 report

Overlap Calculator Details
Overlap calculator reads in whether an overlap phase is in use and what type of phasing is associated with the right turn approach and the overlapped approach
V/S is read in for right turn movement, and remaining approaches from previous calculations
-right turn overlap v/s is just the v/s for the right turn movement (i.e. NBR)
-right turn approach v/s is the critical v/s associated with the right turn approaches (i.e. NB/SB) and is calculated differently for protected vs split
-overlap approach v/s is the critical v/s associated with the overlap approaches (i.e. EB/WB) and is calculated differently for protected vs split phasing
The v/s overlap column sums the 3 v/s values for the overlap phasing to get the total v/s overlap to be used in the v/c calculation
If there are overlaps for multiple approaches, the v/s overlap will use the greatest of the approaches for most conservative approach
Use Overlap Calculator' must be enabled and 'Use OV V/S' must be showing in V/S Overlap column in order for overlap v/s to be used in final v/c calculation

	use dropdown	BEGIN	Sat. Flow Default	1700	1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
Intersection ID and Name	Control Type	CALCULATIONS	Major Approach	Row Reference		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		NB	SB	EB	WB	Synchro ID
1: US 101 & 73rd Ct/73rd St	TWSC		#N/A	7														1: US 101 & 73rd Ct/73rd St V/C	0.00	0.00	0.00	0.00	1
				8														1: US 101 & 73rd Ct/73rd St Delay	0.00	0.00	0.00	0.00	
				19		0	0	0	0	0	0	0	0	0	0	0	0	1: US 101 & 73rd Ct/73rd St LOS	A	A	A	A	
					Major V/C Lanes	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C																		
					Minor (or AWSC) V/C																		
				45																			
				47																			
				48																			
				49																			
3: US 101 & Oceanview Dr	TWSC		NB/SB	7	Movement	EBL		EBR				NBL	NBT			SBT	SBR	3: US 101 & Oceanview Dr V/C	0.68	0.57	0.96	0.00	3
				8	Lane Configurations	1		0				1	1			1	1	3: US 101 & Oceanview Dr Delay	10.80	0.00	103.20	0.00	
				19	Mvmt Flow	130	0	60	0	0	0	20	1150	0	0	970	55	3: US 101 & Oceanview Dr LOS	B	A	F	A	
				10	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C							0.03	0.68			0.57	0.03						
					Minor (or AWSC) V/C	0.96																	
				45	Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.03	-	0.96	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	10.8	-	103.2	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	F	-	-	0	0	0	0	0	0						
4: US 101 & 36th Street	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		4: US 101 & 36th Street V/C	0.64	0.59	0.00	0.20	4
				8	Lane Configurations				1		0		1	1	1	1		4: US 101 & 36th Street Delay	0.00	10.80	0.00	28.00	
				19	Mvmt Flow	0	0	0	25	0	15	0	1085	40	10	995	0	4: US 101 & 36th Street LOS	A	B	A	D	
				70	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.64	0.02	0.02	0.59							
					Minor (or AWSC) V/C				0.20														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.20	0.02	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	28.0	10.8	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	D	B	-	0	0	0	0	0	0						
5: US 101 & 31st St	TWSC		NB/SB	7	Movement				WBL		WBR		NBT	NBR	SBL	SBT		5: US 101 & 31st St V/C	0.66	0.59	0.00	0.25	5
				8	Lane Configurations				1		0		1	1	1	1		5: US 101 & 31st St Delay	0.00	11.40	0.00	31.00	
				19	Mvmt Flow	0	0	0	35	0	10	0	1115	90	20	995	0	5: US 101 & 31st St LOS	A	B	A	D	
				127	Major V/C Lanes	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R						
					Major V/C								0.66	0.05	0.03	0.59							
					Minor (or AWSC) V/C				0.25														
				45	Minor Lane/Major Mvmt	0	NBT	NBR	WBLn1	SBL	SBT	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	0.25	0.03	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	-	-	31.0	11.4	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	-	-	D	B	-	0	0	0	0	0	0						
10: US 101 & Angle St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	10: US 101 & Angle St V/C	0.00	0.35	0.05	0.00	10
				8	Lane Configurations	0	1	0	0	0	2	0	0	0	0	2	0	10: US 101 & Angle St Delay	0.00	0.00	14.00	0.00	
				19	Mvmt Flow	0	0	20	0	0	1025	0	0	0	0	1145	45	10: US 101 & Angle St LOS	A	A	B	A	
				184	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.01	0.01			0.30					0.35	0.35						
					Minor (or AWSC) V/C	0.05																	
				45	Minor Lane/Major Mvmt	0	EBLn1	SBT	SBR	0	0	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.05	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	14.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	-	0	0	0	0	0	0	0	0						
12: US 101 & Bayley St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	12: US 101 & Bayley St V/C	0.33	0.37	0.51	0.31	12
				8	Lane Configurations	0	1	0	0	1	0	1	2	0	0	2	0	12: US 101 & Bayley St Delay	11.90	10.90	53.20	45.00	
				19	Mvmt Flow	15	0	60	10	0	30	25	1110	10	10	1195	20	12: US 101 & Bayley St LOS	B	B	F	E	
				241	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.04	0.04		0.02	0.02	0.05	0.33	0.33	0.37	0.36	0.36						
					Minor (or AWSC) V/C	0.51			0.31														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.05	-	-	0.51	0.31	0.02	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	11.9	-	-	53.2	45.0	10.9	0.3	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	-	-	F	E	B	A	-	0	0	0						
13: Benton St & US 20	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	13: Benton St & US 20 V/C	0.90	0.37	0.44	0.37	13
				8	Lane Configurations	1	1	0	1	1	0	0	1	0	0	1	0	13: Benton St & US 20 Delay	74.40	42.30	8.80	9.90	
				19	Mvmt Flow	15	695	45	120	625	5	20	5	210	5	10	40	13: Benton St & US 20 LOS	F	E	A	A	
				298	Major V/C Lanes	L	T or TR	TR or R	L	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.02	0.44	0.44	0.14	0.37	0.37		0.13	0.13		0.03	0.03						
					Minor (or AWSC) V/C							0.90			0.37								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.90	0.02	-	-	0.14	-	-	0.37	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	74.4	8.8	-	-	9.9	-	-	42.3	0.0	0.0	0.0						
				49	HCM Lane LOS	0	F	A	-	-	A	-	-	E	0	0	0						
15: Oceanview Dr & Pacific Pl/25th St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	15: Oceanview Dr & Pacific Pl/25th St V/C	0.12	0.07	0.00	0.20	15
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	15: Oceanview Dr & Pacific Pl/25th St Delay	0.00	7.70	0.00	11.10	

	use dropdown	BEGIN	Sat. Flow Default	1700	1	3	4	5	6	7	8	9	10	11	12	13	14	Outputs					
Intersection ID and Name	**Control Type**	CALCULATIONS	**Major Approach**	**Row Reference**		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**		**NB**	**SB**	**EB**	**WB**	**Synchro ID**
				19	Mvmt Flow	0	0	0	80	0	70	0	110	100	20	90	0	15: Oceanview Dr & Pacific Pl/25th St LOS	A	A	A	B	
				355	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C		0.00	0.00		0.04	0.04		0.12	0.12	0.07	0.05	0.05						
					Minor (or AWSC) V/C	-			0.20														
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	0	0	0						
				47	HCM Lane V/C Ratio	0.00	-	-	-	-	0.20	0.02	-	-	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	0.0	-	-	0.0	11.1	7.7	0.0	-	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	-	-	A	B	A	A	-	0	0	0						
16: Nye St & 11th St	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	16: Nye St & 11th St V/C	**0.20**	**0.10**	**0.02**	**0.03**	**16**
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	16: Nye St & 11th St Delay	**10.30**	**10.20**	**7.30**	**7.30**	
				19	Mvmt Flow	5	30	5	15	25	10	15	100	55	15	60	5	16: Nye St & 11th St LOS	**B**	**B**	**A**	**A**	
				412	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.02	0.02	0.02	0.03	0.02	0.02		0.09	0.09		0.04	0.04						
					Minor (or AWSC) V/C							0.20			0.10								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.20	0.00	-	-	0.01	-	-	0.10	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	10.3	7.3	0.0	-	7.3	0.0	-	10.2	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
17: Harney St & 7th St	AWSC		N/A	9	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	17: Harney St & 7th St V/C	**0.19**	**0.00**	**0.19**	**0.07**	**17**
				10	Lane Configurations	0	1	0	0	1	0	0	1	1	0	1	0	17: Harney St & 7th St Delay	**9.50**	**7.70**	**7.90**	**8.00**	
				15	Mvmt Flow	1	40	135	25	30	0	125	0	35	0	1	0	17: Harney St & 7th St LOS	**A**	**A**	**A**	**A**	
				471	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LT	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C		0.10	0.10		0.02	0.02		0.00	0.02		0.00	0.00						
					Minor (or AWSC) V/C	0.19			0.07			0.19	0.04		0.00								
				29	Lane	0	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	0	0	0	0	0	0						
				45	HCM Lane V/C Ratio	0.00	0.19	0.04	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
				46	HCM Control Delay	0.0	9.5	7.2	7.9	8.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0						
				47	HCM Lane LOS	0	A	A	A	A	A	0	0	0	0	0	0						
18: 9th St & Hurbert St	TWSC		NB/SB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	18: 9th St & Hurbert St V/C	**0.42**	**0.00**	**0.49**	**0.60**	**18**
				8	Lane Configurations	1	1	0	0	1	1	0	2	0	0	0	0	18: 9th St & Hurbert St Delay	**7.30**	**0.00**	**64.80**	**74.80**	
				19	Mvmt Flow	10	55	0	0	70	60	50	1315	25	0	0	0	18: 9th St & Hurbert St LOS	**A**	**A**	**F**	**F**	
				524	Major V/C Lanes	L	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C		0.03	0.03		0.04	0.04	0.42	0.39	0.39									
					Minor (or AWSC) V/C	0.09	0.49		0.60	0.15													
				45	Minor Lane/Major Mvmt	0	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.03	-	-	0.09	0.49	0.60	0.15	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	7.3	0.4	-	39.9	64.8	74.8	15.9	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	A	-	E	F	F	C	0	0	0	0						
19: 9th St & Abbey St	TWSC		EB/WB	7	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	19: 9th St & Abbey St V/C	**0.18**	**0.17**	**0.05**	**0.07**	**19**
				8	Lane Configurations	0	1	0	0	1	0	0	1	0	0	1	0	19: 9th St & Abbey St Delay	**12.10**	**12.10**	**7.60**	**7.40**	
				19	Mvmt Flow	25	35	15	1	75	45	20	80	10	40	45	15	19: 9th St & Abbey St LOS	**B**	**B**	**A**	**A**	
				581	Major V/C Lanes	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R	LTR	T or TR	TR or R						
					Major V/C	0.05	0.03	0.03	0.07	0.07	0.07		0.05	0.05		0.04	0.04						
					Minor (or AWSC) V/C							0.18			0.17								
				45	Minor Lane/Major Mvmt	0	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.18	0.02	-	-	0.00	-	-	0.17	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	12.1	7.6	0.0	-	7.4	0.0	-	12.1	0.0	0.0	0.0						
				49	HCM Lane LOS	0	B	A	A	-	A	A	-	B	0	0	0						
20: Bay Blvd & Moore Dr	TWSC		NB/SB	7	Movement	EBL		EBR				NBL	NBT			SBT	SBR	20: Bay Blvd & Moore Dr V/C	**0.10**	**0.09**	**0.27**	**0.00**	**20**
				8	Lane Configurations	1		0				1	1			1	1	20: Bay Blvd & Moore Dr Delay	**7.80**	**0.00**	**13.10**	**0.00**	
				19	Mvmt Flow	65	0	100	0	0	0	145	160	0	0	155	110	20: Bay Blvd & Moore Dr LOS	**A**	**A**	**B**	**A**	
				638	Major V/C Lanes	LTR	T or TR	TR or R	LT	T or TR	TR or R	L	T or TR	TR or R	LT	T or TR	TR or R						
					Major V/C							0.10	0.09			0.09	0.06						
					Minor (or AWSC) V/C	0.27																	
				45	Minor Lane/Major Mvmt	0	NBL	NBT	EBLn1	SBT	SBR	0	0	0	0	0	0						
				47	HCM Lane V/C Ratio	0.00	0.10	-	0.27	-	-	0.00	0.00	0.00	0.00	0.00	0.00						
				48	HCM Control Delay (s)	0.0	7.8	-	13.1	-	-	0.0	0.0	0.0	0.0	0.0	0.0						
				49	HCM Lane LOS	0	A	-	B	-	-	0	0	0	0	0	0						

Sheet Description:
This sheet reads in lane configurations by representing exclusive through or shared lanes with the number of lanes in the through movement, and any exclusive number of turn lanes in the respective turn movement. So a single LTR lane would have 1 under through and 0s under left and right.
This sheet also reads in movement flow and select v/c, LOS, and delay results. The calculations are shown in the box.
Calculations are split out by major and minor approach v/c; Major approach is determined from free approaches in report
The major v/c lanes row indicates the left turn lane configuration for each approach. This is important to determine how to add in the delay from the left turns to the overall calculated v/c for the major approach
In the major v/c row, left turn v/c is read from the report, while remaining movement v/c ratios are calculated based on the methodology given in the ODOT APM and the provided default saturation flow rate of 1700 (can be changed by user)
In the minor v/c row, v/c ratios by lane are calculated based on the ODOT APM method using volume and assumed saturation flow rate
The v/c ratio by approach is the max of the v/c by lane as calculated in the major or minor v/c rows
LOS and Delay by approach are read in from the report
For AWSC, all approaches are treated as minor approaches and the calculations remain the same
The summary table selects the worst approach for both directions and concatenates the results with a / for the final summary table for TWSC. For AWSC, the overall worst approach is reported.

APPENDIX L- PUBLIC INVOLVEMENT SUMMARY

NEWPORT TSP: PHASE 1 OUTREACH SUMMARY

CONTENTS

INTRODUCTION

The City of Newport and the Oregon Department of Transportation (ODOT) are updating the City's Transportation System Plan (TSP) – a long range plan that will guide future investments in the City's transportation system. During phase one of the public involvement process, the City of Newport and ODOT conducted an online open house, hosted a virtual workshop, and sent paper surveys to residents in the Newport area. Feedback received throughout this period will be considered as the City of Newport identifies the next steps of the TSP.

> *Overall, the respondents want to see improvements to Newport's transportation system that will benefit all residents and visitors, with a particular focus on alternative transit modes (walking, biking, transit).*

The graphs shown in blue are for the online open house responses (English), pink are for the short printed surveys (English), and green are for the short printed surveys (Spanish).

There was also a strong call for linking the transportation improvements to land use/redevelopment opportunities. Common themes:

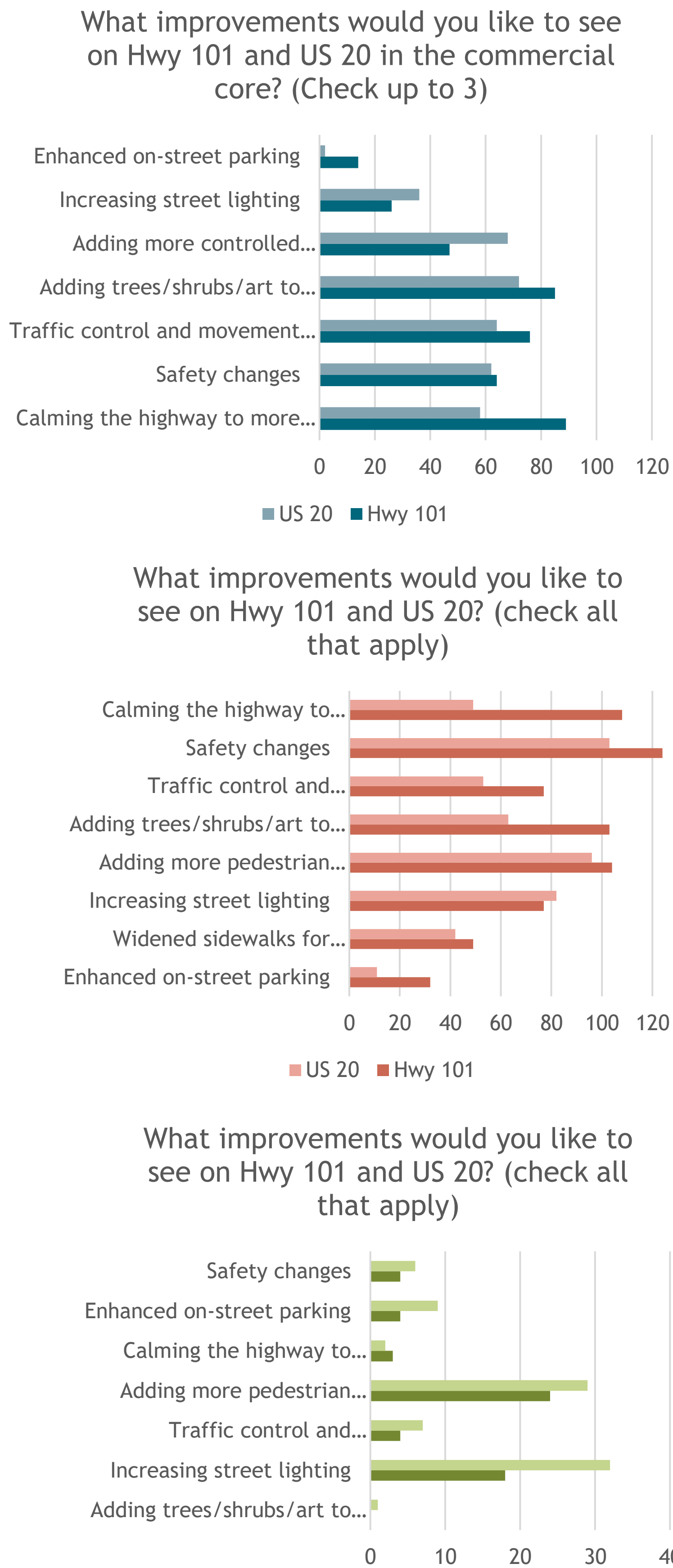
- **pedestrian and bicyclist safety**
- **increased bus/transit/shuttle options**
- **parking improvements**, especially in the city center
- **traffic speeding enforcement**
- **preserve/rebuild the Yaquina Bay Bridge** in the same location
- **strong support for emerging technology** such as electric vehicles (EV) charging stations, followed by parking solutions (metered, long-term, smart park) and solar power

The biggest differences between collection methods responses showed up in the Central Core/Hwy 101 and US 20 questions (Figures 1-3).

- Written English: "safety changes to both Hwy 101 and US 20"
- Online English: "calming the highway" on Hwy 101 and "adding trees/shrubs/art to buffer the sidewalk from cars" on US 20
- Written Spanish: "increasing street lighting" on US 20 and "adding more pedestrian crossing" on Hwy 101
- Spanish-speaking virtual event: "adding trees/shrubs/art to buffer sidewalk from cars" and "safety changes" on US 20

Additionally, there were several comments submitted via the project website that highlighted specific roads or intersections that are unsafe for drivers and bicyclists, see Appendix 4.

The demographics were slightly different for each collection method, with a slightly younger and more diverse group of participants using the online open house compared to the written survey. Respondents, regardless of collection method, mostly drove or walked around Newport. Ages were not collected for Spanish participants.



Figures 1-3 - Online Open House (English) and short written survey (English/Spanish)

OUTREACH METHODS AND OVERALL PARTICIPATION

After conducting a round of targeted stakeholder interviews, the City of Newport and ODOT embarked upon Phase one of a city-wide public involvement process that began in November 2020 and consisted of the following outreach methods for collecting feedback:

- An online open house, from November 16, 2020 to December 21, 2020. This online open house received **292** unique visitors. **203** visitors chose to fill out the questions.
- A virtual workshop on November 21, 2020. Nearly **30** participants attended this event.
- Comments received through the project website. **36** email comments were received through the project website.

A written survey was provided as an extra accessibility measure for communities with barriers to accessing the online open house.

- A written survey was mailed to persons 60+ years of age on the Parks & Recreation/Senior Center mailing list of **1,863** individuals in early December. Surveys were also distributed via the Meals on Wheels program. **306** written surveys were mailed back to the City. Seniors often have a difficult time accessing online platforms, so a written survey reduced barriers. Many of the issues faced by seniors or people with disabilities help with universal design that benefits all transportation users. Collecting feedback from this demographic group will capture issues affecting these two groups.
- A long-form Spanish language survey (that was the same as the online open house) was mailed to **50** residents of Newport. Another **44** short-form surveys were completed via telephone outreach in partnership with Centro de Ayudad, a local nonprofit that works directly with the Spanish speaking residents. The City also conducted a virtual event on January 7, 2021 (**10** people participated). Spanish speakers have been heavily impacted by COVID-19 so individual communication via trusted community partners such as Centro de Ayudad reinforce the importance of the project as well as the importance in collecting information from Spanish-speakers who are historically under-represented in planning projects.

The following methods of outreach were used to publicize the online open house and survey:

- Two emails to the City of Newport's Parks & Recreations email distribution list
- Two emails to the School District's email distribution list
- Multiple posts on Facebook, including paid advertising
- Advertisements on the City website, including distribution in its electronic newsletter (twice a month)
- Emails to City distribution lists for businesses affected by COVID-19 and short-term rental interest groups
- Emails to the individuals and groups on the initial stakeholder interview list, including the Chamber of Commerce, Newport Rotary Club, Yaquina Bay Economic Foundation, and Nye Beach Merchants
- Promotional flyer included in the October utility bill (citywide distribution)
- Citywide postcard mailing
- Newspaper and radio ads and radio shows

FEEDBACK SUMMARY

In the following pages, results from each outreach method are listed by geographic area of the City (Citywide, Agate Beach, Commercial Core, Nye Beach/Bayfront, Newport Bridge/South Beach).

Citywide

Each of the outreach methods collected information from participants about general improvements they would like to see for the City of Newport. The most common themes were "concerns about safety for pedestrians and bicyclists" (Figure 4). Other common themes included:

- The need for increased bus/transit/shuttle options
- A desire for improvements to parking, especially in the city center
- The lack of a safe bike route through the City
- Concerns about access for seniors and people with disabilities
- Concerns about the lack of traffic enforcement, especially speeding

Of the 203 online open house participants top issues were "pedestrian connections and safety" followed by "bicycle connections and safety," then "congestion." The "other" comments can be found in Appendix 1.

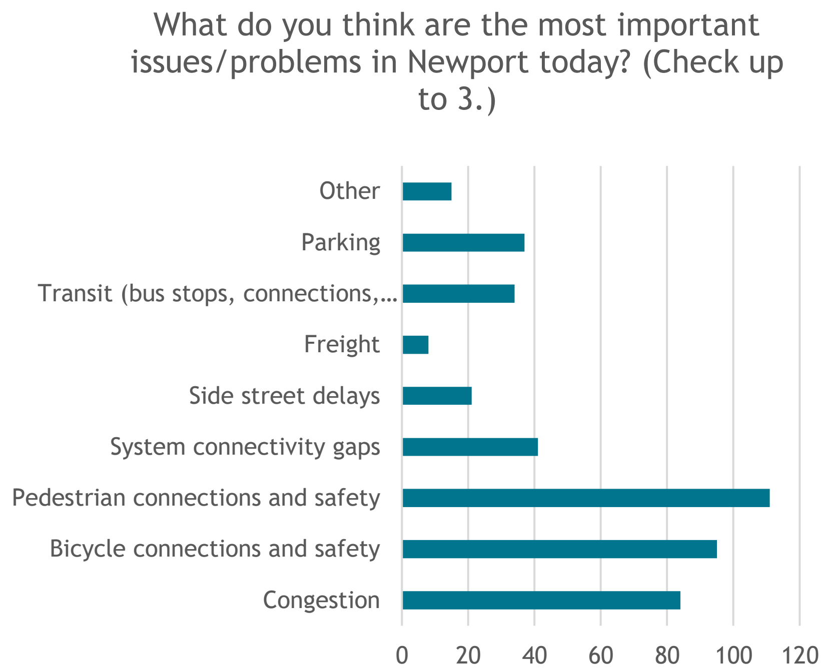


Figure 4 - Online Open House

Walking and Biking

Participants identified which experience would feel safe for walking or biking in Newport.

- English written survey: “separate path for walking and biking off the road or completely separated” followed by “sidewalk plus a bike lane at the edge of the road” (Figure 5)
- Spanish-speaking survey: more interested in “protected bike path/lane,” followed by “separate path for walking and biking” (Figure 6)

In order to get around town without using Highway 101, online open house participants’ top choice was “extending Harney Street” to be a new two-way vehicle route. They also had a lot of interest in converting “Big Creek Road” into a two-way street and using “Oceanview Drive/Nye Street/7th Street” as a through-town route.

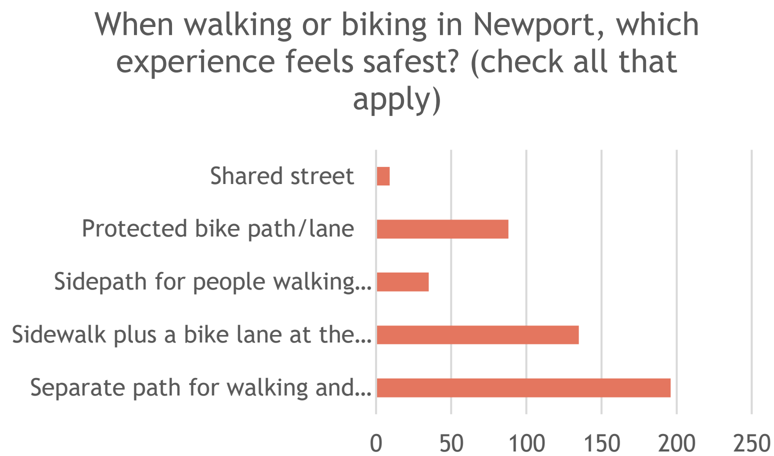
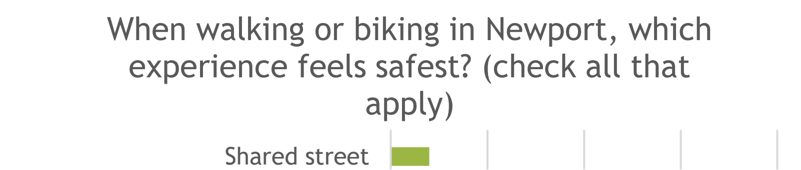


Figure 5 - English Printed Survey



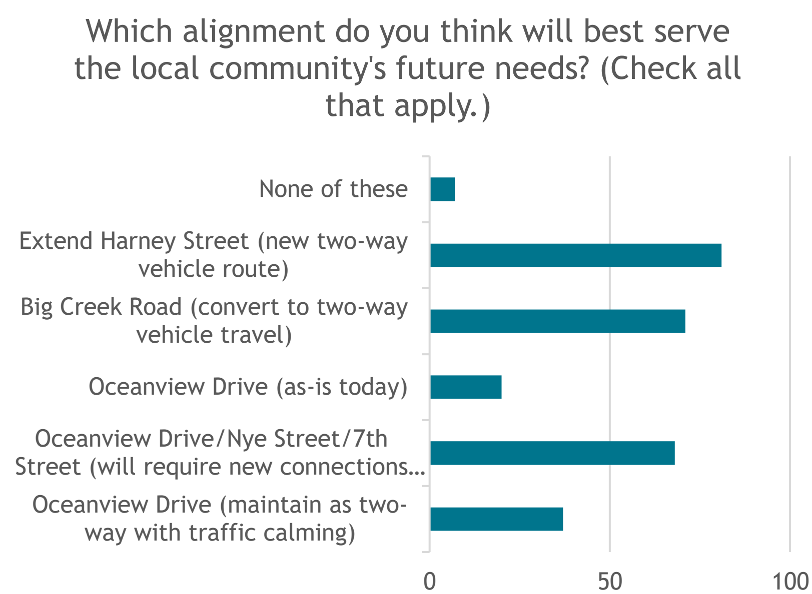


Figure 7 - Online Open House

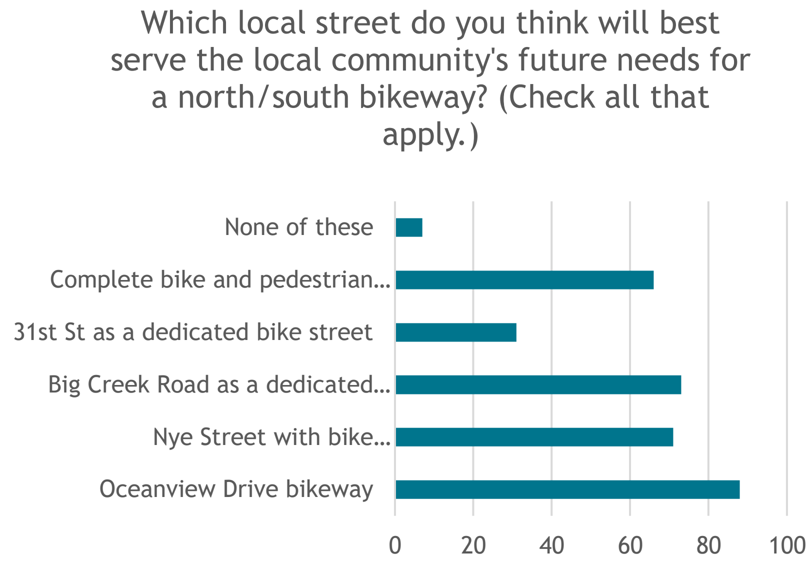
When asked about their preference for a bike network for north/south travel (Figures 8-10):

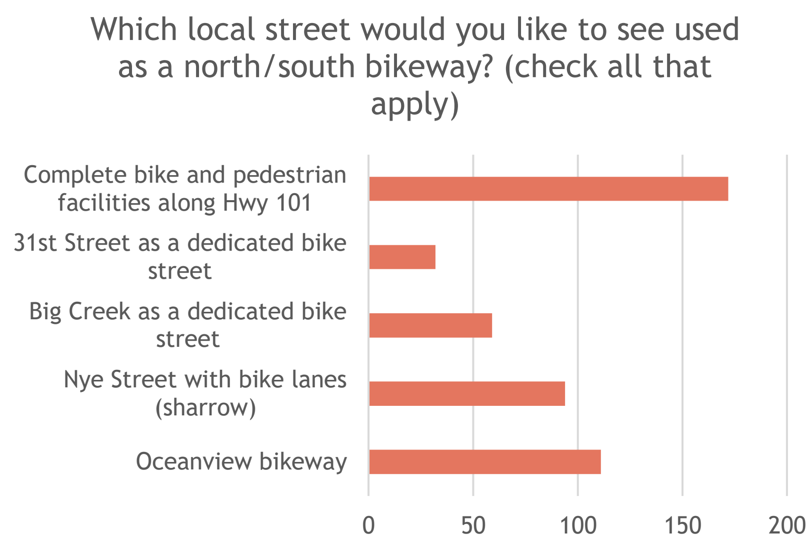
- Online open house: "Oceanview Drive" bikeway, followed by "Big Creek Road" then "Nye Street" with bike lanes or sharrows.
- Written survey (English and Spanish): "complete bike and pedestrian facilities along Hwy 101" followed by "Oceanview bikeway" (English) and "Nye Street" (English & Spanish).
- Spanish-speaking event: also preferred "Oceanview bikeway."

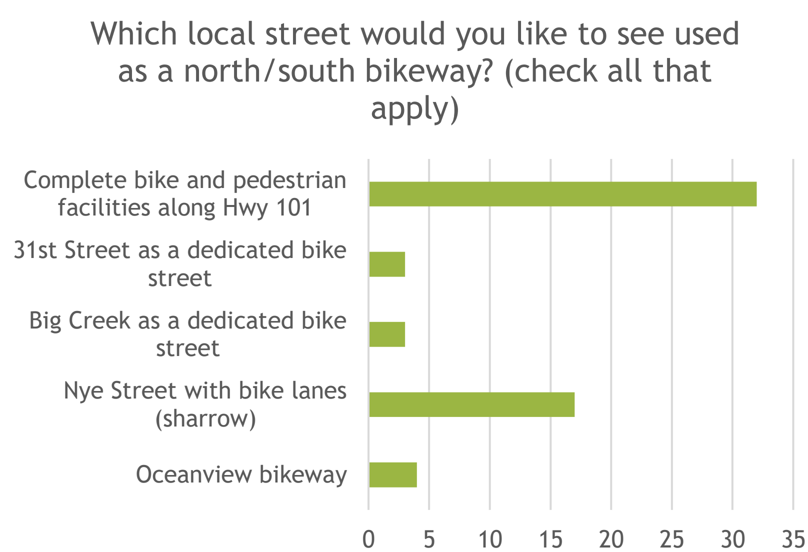
Traffic Calming

Online participants chose up to three strategies for traffic calming among six choices, listed below by roadway type (Figure 11).

- For residential collectors, as well as commercial areas, the top selection was "streetscape elements." This choice was followed closely for commercial areas with "sharing the pavement with cars, bikes, and peds with lower speeds plus pavement markings" and "narrow the road/travel lanes for residential collectors."
- On local streets the two top choices were "sharing the pavement with cars, bikes and peds with lower speeds plus pavement markings" and "narrowing the road/travel lanes."







Figures 8-10 - Online Open House (English) and short written survey (English/Spanish)

Online participants provided open-ended answers to the question "On which streets do you want to see these traffic calming measures?" A large proportion of participants identified Oceanview Drive as their top pick, followed by Eads St, Bay Blvd, and Nye St.

Emerging Technologies

Online participants also provided open-ended answers to the question asking what other technologies the City should be planning for. The biggest focus was the plan for electric cars and charging stations, followed by parking solutions (metered, long-term, smart park) and solar power. See Appendix 1 for a full list of responses.

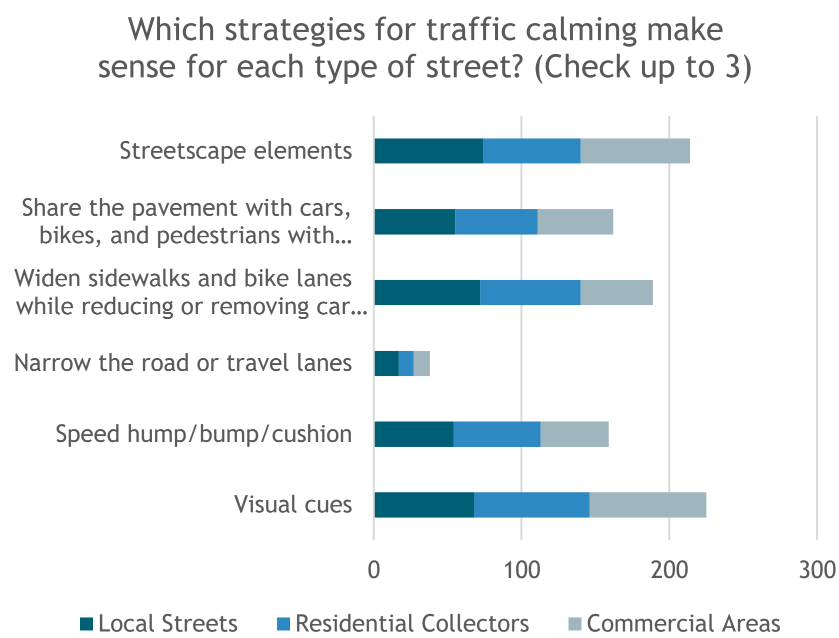


Figure 11 – Online Open House (English) responses

Other Solutions

The online and paper surveys open-ended question, "Are we missing any other solutions for the future of Newport's transportation system?" resulted in 268 responses. **The top theme was improving the safety of pedestrians and bicyclists** by doing things such as building more bike paths, multiuse paths and/or sidewalks; keeping bicycles off of Highway 101 for safety; increasing the number of sidewalks in town; and widening the sidewalks. Respondents to the short written survey in Spanish had many open ended responses about transit safety, as well as improvements for bus reliability and speed.

Other key themes included the following, in order of interest level:

- Transit improvements, such as more bus shelters, more stops, adding tourist shuttles.
- Control speeding: police enforcement, photo enforcement, or speed bumps.
- Revise the parking plan, especially by removing on-street parking in the Art Deco district.
- Improve crosswalks, e.g. more striping and installing RRFBs at busy or dangerous intersections.
- Spruce up downtown so that it looks more attractive by painting, redesigning facades, etc.
- General road repair/paving on select streets.
- ADA improvements so that disabled residents and seniors are better served.

During the virtual workshop, members of a breakout room discussed the following citywide issues. For a complete list of discussion notes, see Appendix 3.

- City should get ahead of EV and provide incentives for network to develop.
- City needs to implement demand management for parking like meters on the Bayfront.
- Nye/Oceanview street connection seems viable and might create better north/south option.
- Speed cushions needed in the city. Perhaps along San Bayo Cir.
- Like Harney Street extension as vehicle only with Big Creek dedicated bike/ped.
- Want to see north/south bike ped improvements from 31st to Harney to Big Creek, providing off-highway connection between residential areas and schools.

- Want to see the City invest in traffic speed enforcement including red light violations. Could be source of needed revenue.
- Extending Harney will generate a lot more traffic in an area where there are a lot of children (middle and high schools). Care needs to be taken to ensure kids are safe.
- Oceanview and Nye concept needs to be further explored with balance of Oceanview one-way with half of road dedicated to bike/ped.
- Nye could be a good north/south alternative route to US 101.
- Like the idea of a couplet on 9th Street, as long as there are no adverse impacts to hospital access.

Agate Beach

Online participants were asked about their vision for the future of Agate Beach (Figure 12), the most popular choice was "bigger changes with bike lanes and sidewalks," followed by "close to what it does today with some small improvements."

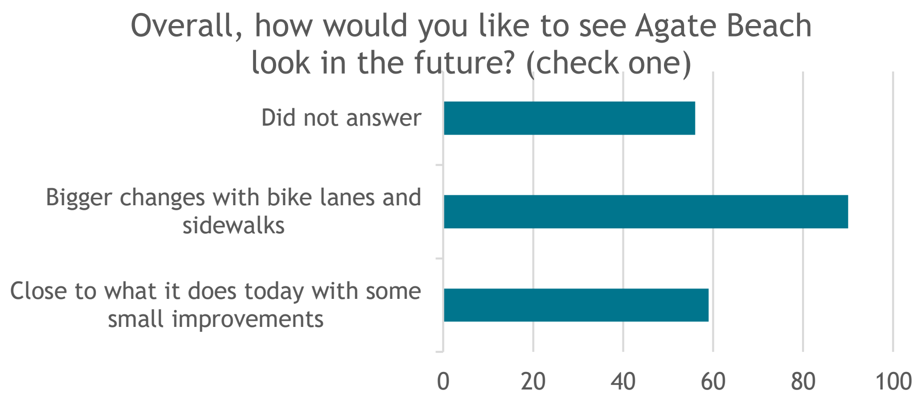


Figure 12 – Online Open House (English) responses

There weren't any open-ended questions that addressed the Agate Beach area. The most frequent general comment that mentioned Agate Beach was a request for safe bike and pedestrian routes from Agate Beach to other areas of town, as well as increased transit options for people who live in this area but don't drive. A few residents also expressed concerns about the quality of roadways and potholes along Agate Beach.

During the virtual workshop, the following items related to Agate Beach were raised. For a complete list of discussion notes, see Appendix 3.

- Stormwater runoff is a big issue in Agate Beach
- Vacation homes in Agate Beach spur more activity
- Poll the neighbors for best walking solution in Agate Beach

Commercial Core

Across the methods of outreach, participants expressed concern about the attractiveness of Newport's downtown area. Several comments used the term "blight" when describing the downtown. Participants were concerned about the number of boarded up businesses. Some participants in the virtual workshop expressed concern about the impact of a couplet on businesses in the area. Other themes included accessibility (both public transit and pedestrian), parking (comments both for and against removing parking), and increased lighting.

Respondents to the online open house and the written short surveys in English and Spanish (Figures 1-3) were asked "What improvements would you like to see on Hwy 101 and US 20?" For written survey English participants, the top response was "safety changes to both Hwy 101 and US 20" and for Spanish respondents "adding more pedestrian crossings" on Hwy 101 and "increased street lighting" on US 20 were most important.

The online open house responses instead selected “calming the highway” as the improvement they would like to see most on Hwy 101 and “adding trees/shrubs/art to buffer the sidewalk from cars” as the improvement they would most like to see on US 20.

Online participants were asked about the intersection of Hwy 101 and US 20: A number of the stakeholders we interviewed believe that the intersection of Hwy 101 and US 20 is congested and unsafe. “Which of these improvements make sense for this intersection? (Check all that apply.)” There were 15 “other” responses. Most were unique responses, however two people recommended adding roundabouts and two people requested adjusting traffic signal timing. See Appendix 1 for all responses.

For the online open-ended question: “Along Highway 101 or US 20 in Newport, are there other areas that need safer school access?” several people said that safer crossings and sidewalks were needed at Highway 101 and US 20. Several noted that the crossing at US 20 and Harney Street was particularly unsafe. A few noted that there should be more awareness about children’s walking routes to school through additional crosswalks, RRFBs, or school crossing signage.

During the virtual workshop, members of a breakout room discussed the commercial core area and brought up the following ideas. For a complete list of discussion notes, see Appendix 3.

- TSP and Highway futures need to be linked to overall Newport economic development and health.
- Overall major interest in pedestrian safety and highway crossings, regardless of 2-way or couplet configurations.
- Most conversations turned to concerns about weak retail environment and closed-up shops in Newport currently.
- Concern about construction period impacts on businesses.
- Questions about if Newport should really emphasize Highway 101 and Highway 20 as main street business districts, as opposed to more emphasis on Nye Beach and Bayfront.
- Folks wanted to know how future Yaquina bridge replacement alignment might impact Highway 101 routing.
- Hurbert signal remains a concern.
- Strong support for bikeways - either on Highway 101 or nearby.
- Numerous voices were fine with the idea of removing some parking from Highway 101 in favor of wider sidewalks and bikeways.
- Hospital has 500 pedestrian crossings a day on 9th Street. How would 9th Street as couplet impact this?

Nye Beach/Bayfront

The online open house asked participants to evaluate solutions suggested for the Nye Beach/ Bayfront area (Figure 13). For both Nye Beach and Bayfront, participants chose “improve wayfinding for tourist parking” as the solution that would best address visitors in the areas. For Nye Beach, participants also selected

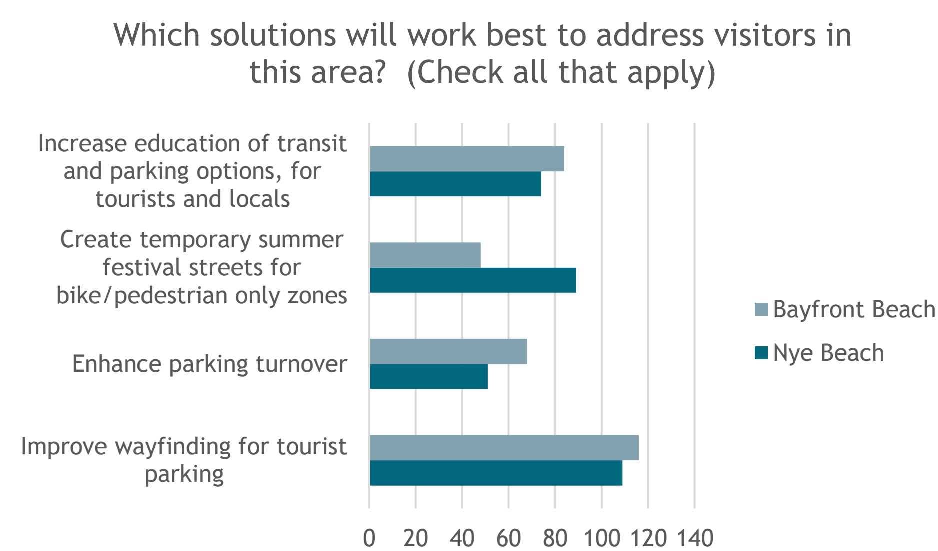


Figure 13 – Online Open House (English) responses

"create temporary summer festival streets for bike/pedestrian only zones" as the second most popular solution. For Bayfront, participants selected "increase education of transit and parking options" as the next best solution.

Neither the online open house nor the written survey asked specific open-ended questions about Nye Beach and Bayfront. Still, some common themes emerged for these areas in other questions. These included: a desire for better public transit in order to reduce congestion in this area; more and better parking, especially for wheelchair-users and others with mobility impairment; and a desire for widening the streets in the area (to lessen congestion).

During the virtual workshop, members of a breakout room discussed the Nye Beach and Bayfront areas and brought up the following ideas. For a complete list of discussion notes, see Appendix 3.

- Oceanview – a lot of large trucks use it / PUD use it in summer / line of sight is key for safety.
- Health - keep in mind travelling around healthily (physical, mental, stress).
- Parking fees - separate visitors from employees.
- Make bikes safer / citywide for local residents and tourists / Oregon Coast route.
- Couplets solve bike needs -- this is only one piece of a regional bike system.
- Interest in the 2-way cycle track.
- Buffer space is a good idea on Biggs / asphalt side path.
- Look at a refuge lane on Highway to serve 2-stage turns.
- Nyla - speed humps on San Bay O / 15 MPH + Dog stations.

Newport Bridge/South Beach

Responses across the various methods of outreach showed a strong attachment to keeping the Yaquina Bay Bridge. Other comments or thoughts about the Yaquina Bay Bridge or transportation in South Beach included:

- Keep the current bridge as a historic presence in Newport or use it as a bike/ped bridge or as a one-way bridge adjacent to a new bridge (which would serve traffic the other way).
- Improved bike/ped access on the new bridge is important.
- Maintaining aesthetics similar to the current bridge is of value.
- Building a bypass bridge that could connect other parts of the community is important.
- A four-lane bridge would alleviate the current bridge congestion problem.

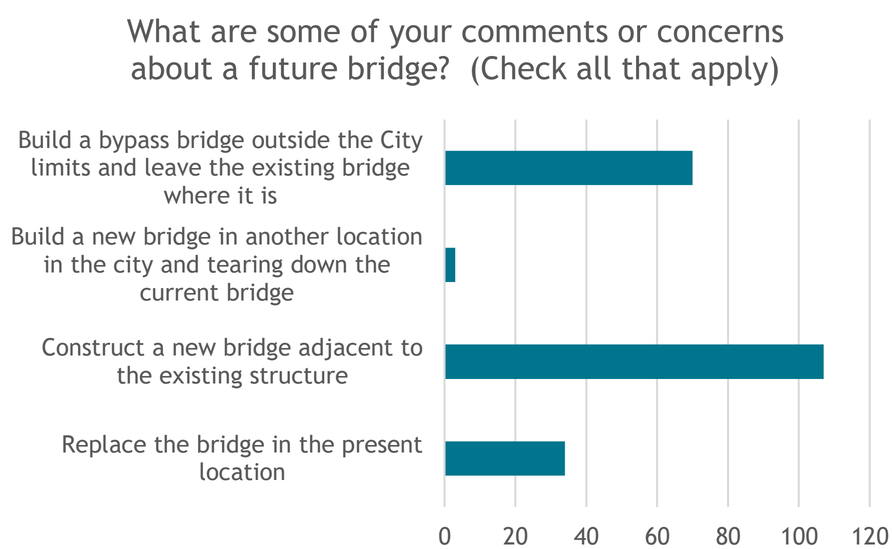


Figure 14 – Online Open House (English) responses

Participants in the online open house responded to one question addressing the possible future replacement of the Yaquina Bay Bridge. Most participants selected the option "construct a new bridge adjacent to the existing structure" followed by "build a bypass bridge outside the City."

Spanish-speaking attendees of the January virtual event were unanimously in favor of “replacing the existing bridge with a new bridge in the same place.”

During the virtual workshop, members of a breakout room discussed the Yaquina Bay area and brought up the following ideas. For a complete list of discussion notes, please see Appendix 3.

- Protect as much as possible.
- Add bike/ped facilities, both sides, one side wider, underneath.
- Additional bridge.
- Tunnel.
- Ferry- recreation and transportation (especially in emergency).

Demographics

Travel

The large majority of participants identified “driving” as their primary mode of transportation (prior to COVID-19) for all methods (Figures 15 and 16). Very few participants selected “transit/bus” or “carpool or ride-sharing.” A common theme in the comments was that participants don’t feel safe “biking,” but would use this mode more frequently if it felt safer.

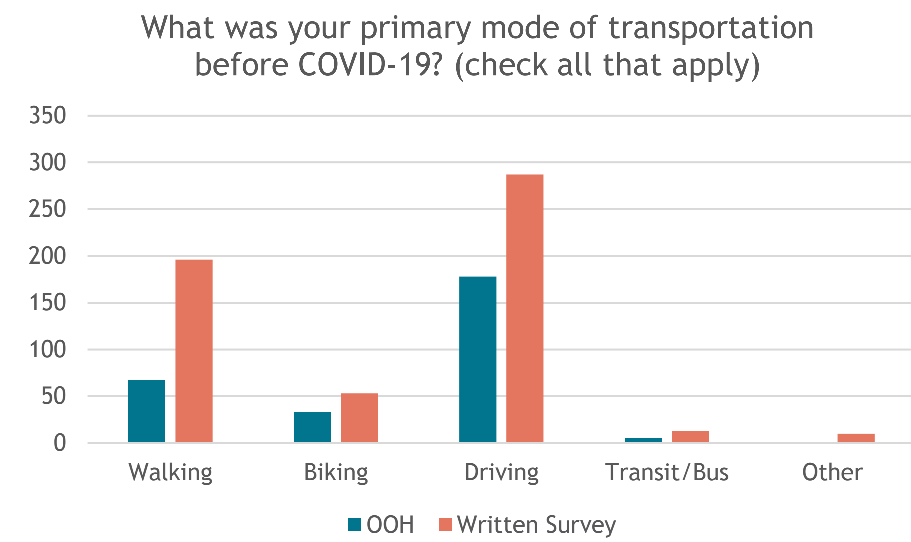


Figure 15 – Online Open House and short written survey (English)

Neighborhood

Participants in the online open house were asked to identify the neighborhood they live in (Figure 17). The most representation came from Agate Beach. Common themes for the “other” category included Seal Rock, unsure/don’t know, or an area outside of town but with a vested interest in Newport’s traffic. The majority of those who chose “other” did not specify their location.

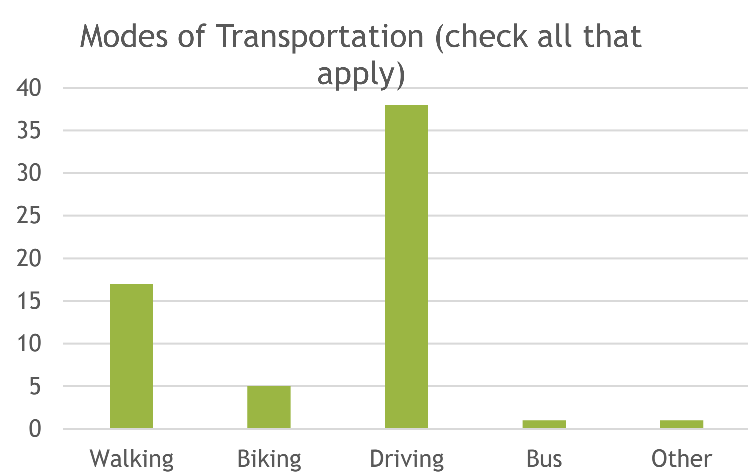


Figure 16 – Short written survey (Spanish)

Race/Ethnicity

The large majority of respondents to both the online open house and the written survey identified as white. Of the 445 participants who chose to identify their race, 87% identified as white, compared to the US Census reporting Newport as having 80.6% white residents. Outreach was performed to Hispanic/Latino populations in the area, with about 54 people taking the short survey or attending a virtual event in Spanish. More outreach may need to be done in the future to ensure a variety of voices are heard throughout this process.

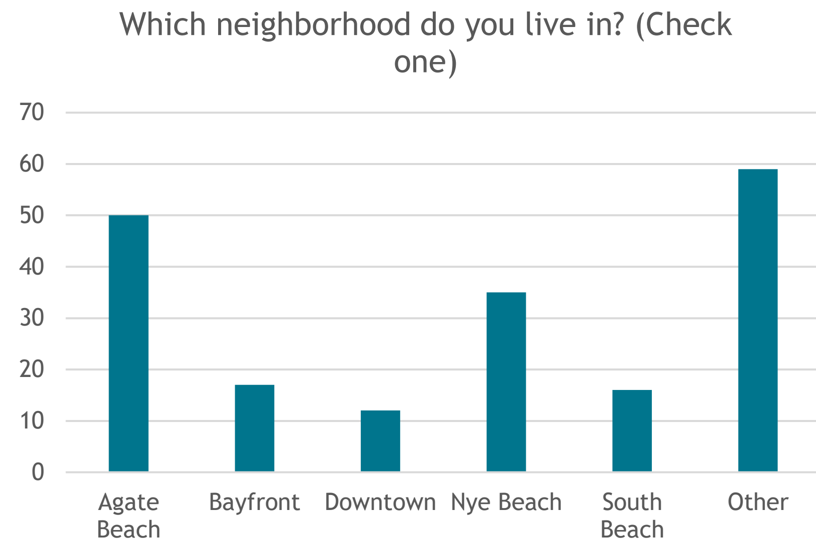


Figure 17 – Online Open House (English) responses

Language

The online open house also asked participants to identify the language(s) they speak at home. Of those participants who answered, 93% identified English as the language they speak at home.

Age

Online open house participants represented a range of ages (Figure 18). A little over a third of participants were between 45-65 years old and another third were between 65-74. Age was not requested for the written surveys but the English survey was distributed to the senior center, so most respondents are assumed to be of retirement age.

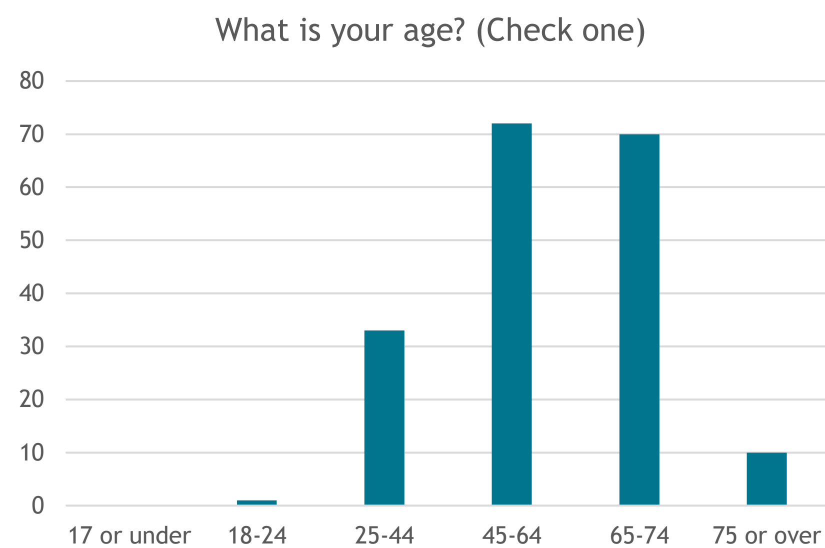


Figure 18 - Online Open House (English)

Income

The majority of participants in the online open house identified a medium to high household income. Less than 10% of respondents reported an income of $25,000 or less, while 38% of respondents reported an income of $100,000 or more. This is not a representative sample of Newport's general population. The US Census reports that the median income for Newport is $49,039 (2015-2019), with 17% of the population living at or below the poverty line.

NEWPORT TSP: PHASE 2 OUTREACH SUMMARY

CONTENTS

Overview

The City of Newport and the Oregon Department of Transportation (ODOT) are updating the City's Transportation System Plan (TSP) – a long range plan that will guide future investments in the City's transportation system. During phase two of the public involvement process, the City of Newport and ODOT conducted an online open house, hosted an in-person workshop, and sent paper surveys to residents in the Newport area. Feedback received throughout this period will help the technical team and decision-makers understand what is important to residents, visitors, and businesses for the future of Newport's transportation system.

> *Overall, the respondents want to see a safer future for all roadway users, where Newport is easy to get around whether people are walking, rolling, riding or driving. Many saw strong connections between the form of the city's buildings/land uses and the success of reaching this goal.*

Themes and Takeaways

There was a strong call for linking the transportation improvements to land use/redevelopment opportunities. Common themes included:

- Desire for pedestrian and bicyclist safety throughout the city
- Need for parking improvements, especially in the city center
- Interest in improving traffic flow and reducing congestion, for through travelers and local users
- Confusion around couplets and how they work

The in-person workshop was attended by about **30** people familiar with the project and who had participated in previous TSP activities or were familiar with City planning processes. Most were also concerned with direct impacts to their property, neighborhood or business. There were strong opinions about the proposed ideas with a heavy focus on better walking and biking opportunities and congestion reduction.

Figure 1 - August 11, 2021 workshop where people could talk to staff and provide input on the draft solutions.

During the event, attendees could ask technical staff questions about the proposed projects (which were also shown on the online open house) and provide comments verbally, on sticky notes on the maps, or on the printed survey.

OUTREACH METHODS AND OVERALL PARTICIPATION

Building off the previous outreach activities, the City of Newport and ODOT conducted outreach activities in August 2021 and collected feedback through:

- An online open house was open for comments from August 2nd to August 30th, 2021. During this time, the site received **356 views** and the survey was answered **76 times.**
    - In partnership with Centro de Ayudad, a local nonprofit that works directly with the Spanish speaking residents, **40** surveys were completed via telephone outreach. Spanish speakers have been heavily impacted by COVID-19 so individual communication via trusted community partners such as Centro de Ayuda reinforce the importance of the project as well as the importance in collecting information from Spanish-speakers who are historically under-represented in planning projects.
- An in-person workshop on August 11, 2021. About **30** participants attended this event, with 22 signing in. Seven printed surveys were filled out by attendees as a way to record their comments.
- A printed survey was mailed to persons 60+ years of age on the Parks & Recreation/Senior Center mailing list of **1,863** individuals in early August. **183** printed surveys were completed (the majority were mailed back to the City).

- A shorter, printed survey was provided as an extra accessibility measure for communities with barriers to accessing the online open house. Seniors often have a difficult time accessing online platforms, so this survey reduced barriers. Many of the issues faced by seniors or people with disabilities help with universal design that benefits all transportation users. Collecting feedback from this demographic group will capture issues affecting these two groups.

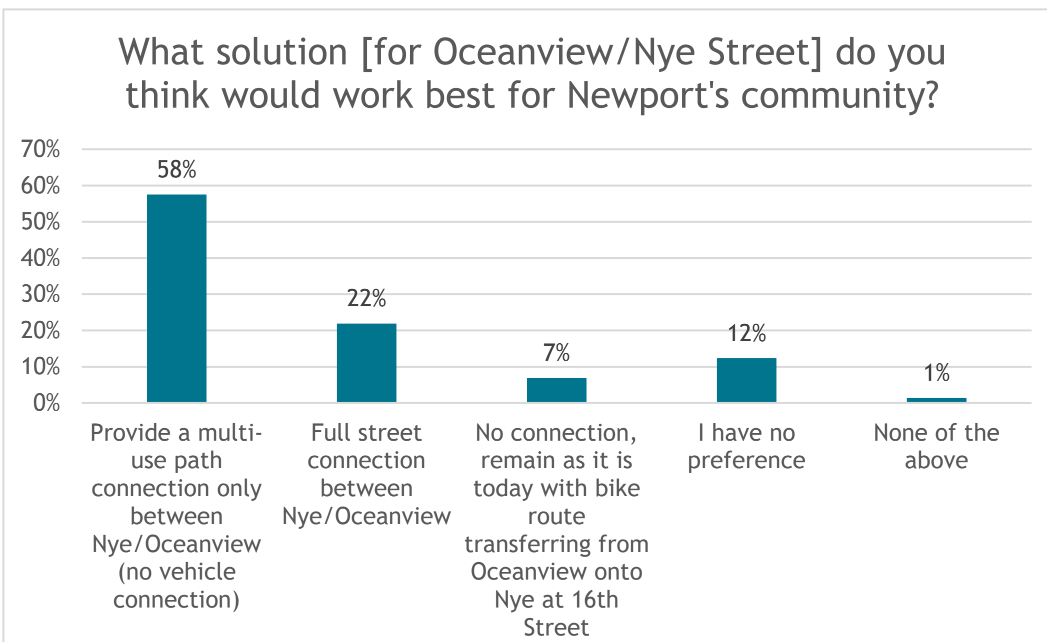
The following methods of outreach were used to publicize the online open house, survey, and in-person workshop:

- Multiple posts on Facebook, including paid advertising
- Advertisements on the City website, including distribution in its electronic newsletter (twice a month)
- Emails to City distribution lists for businesses affected by COVID-19 and short-term rental interest groups
- Emails to the individuals and groups on the initial stakeholder interview list, including the Chamber of Commerce, Newport Rotary Club, Yaquina Bay Economic Foundation, and Nye Beach Merchants
- Citywide postcard mailing
- Newspaper articles and radio ads and radio shows

FEEDBACK SUMMARY

In the following pages, results from the various outreach methods are summarized. The survey was focused on key questions, and the values behind those questions, to help decision-makers move forward with a final Transportation System Plan for Newport.

Solutions for Oceanview/Nye Street

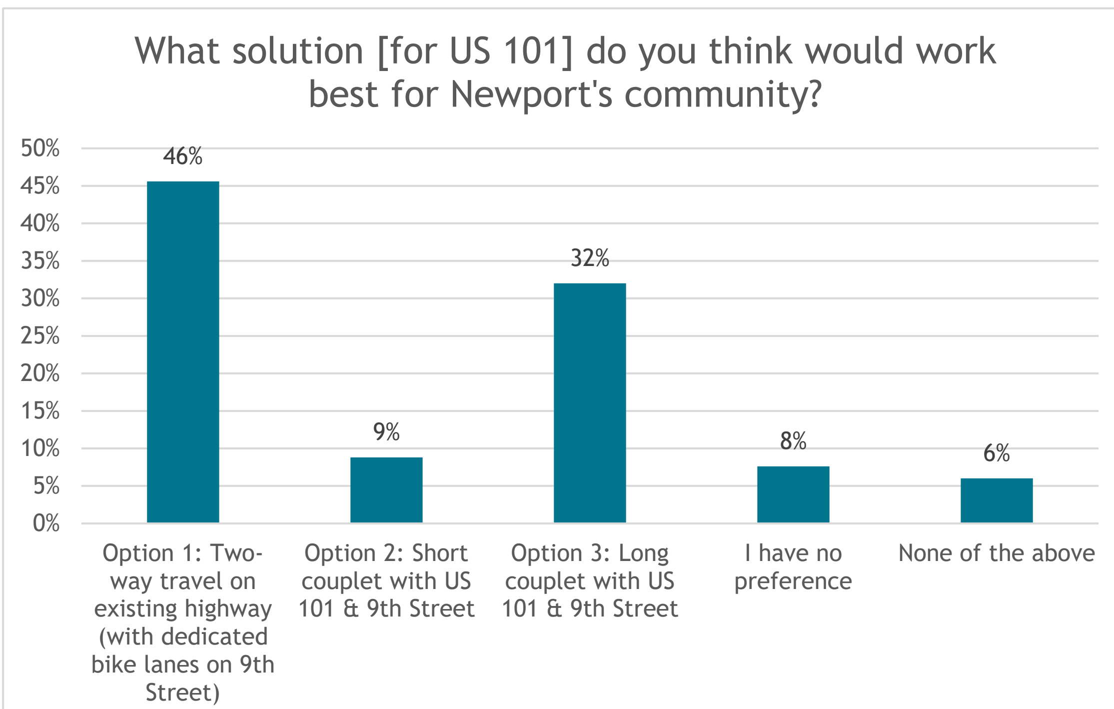


Respondents to the online open house were asked to select the solution they felt would work best for pedestrian and bike connections Oceanview/Nye Street (this question was not included on the printed survey). The majority of respondents **(58%)** said they thought a multi-use path connection between Nye/Oceanview with no vehicle connection would be the best solution. Another **22%** said they felt a full street connection would be best of the community. Twelve percent said they had no preference and **7%** said they wanted the streets to remain as they are today.

Respondents were asked to choose from a list of factors that were important to them in making the above selection. *Counts for those responses are listed here, as well as the most relevant comments in the "other" option. A full list of the comments left for this question can be found in Appendix A.*

- Multi-modal (bike/pedestrian safety) – **46**
- Improving car/vehicle access – **13**
- Removing car/vehicle access – **8**
- Other – **9**
    - "A new intersection that would be difficult to transition from the extended Nye to Oceanview for vehicles? As a bike path it could take Bicycles and some foot traffic off Oceanview in a difficult area."
    - "Environmental impact, vehicle intersection on a curve, cost."
    - "Losing car traffic on 101 hurts local businesses. Losing bikes doesn't."
    - "Motor vehicles already use Oceanview too much and there's no reason to force a lot of vehicles into what's now a quiet neighborhood w/a gravel road where the Nye St dead ends."
    - "It would serve no valuable purpose."

Solutions for US 101



Building off the responses from Phase 1 to improve the downtown core and make the entire highway more friendly for people walking or biking, the technical team developed three solutions for US 101. Respondents to the online open house and printed survey were asked to select which solution would work best for Newport's community. Nearly half of respondents **(46%)** selected Option 1 as the best solution. Forty-one (41%) supported some form of a couplet, with **32%** of respondents selecting Option 3 and **9%** of respondents selecting Option 2. **Eight** percent had no preference and **6%** did not want any of the options.

Of the 40 Spanish survey responses, **21** selected for Option 1, **3** selected Option 2 and **16** selected Option 3 as working best for Newport's community.

Respondents were asked to choose from a list of factors that were important to them in making the above selection. *Counts for those responses from both the printed survey and the online open house are listed here, with the top themes arising from the "other" answers. A full list of the comments left for this question can be found in Appendix B.*

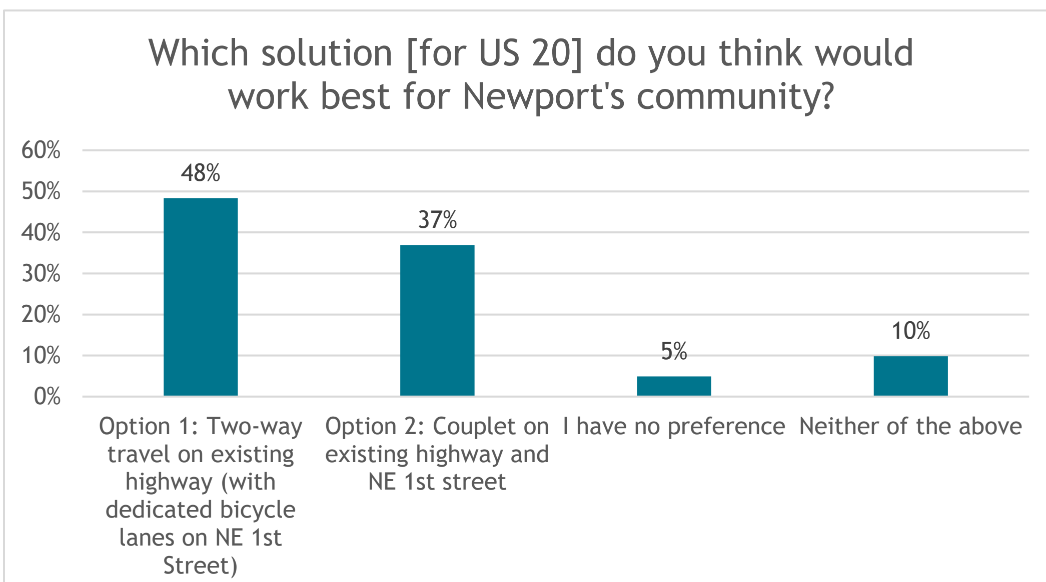
- Improves safety for bicyclists – **121**
- Makes it easier to drive around town – **126**
- Improves safety for pedestrians – **92**
- Promotes mixed-uses and activity centers – **65**
- Increases streetscape improvement opportunities – **65**
- Improves parking – **44**
- Other factors for US 101 – **60**

Themes for the additional factors included:

- The impact of a couplet (positive and negative) on traffic flow
- Keeping traffic away from the hospital
- The need for a center/lane turn lane on 101
- Concern for businesses on 101
- Do not want more traffic on 9th Street
- Decreasing complexity and increasing safety
- Getting bikes off of US 101

Solutions for US 20

Respondents to the online open house and printed survey were asked to select which solution would work best for improving the safety of US 20 as it enters the downtown core. Nearly half of respondents **(48%)** selected Option 1 as the best solution. Just over a third **(37%)** of respondents selected Option 2. **Five** percent had no preference and **10%** did not want any of the options.



Of the 40 Spanish survey responses, **13** selected for Option 1 and **27** selected Option 2 as working best for Newport's community.

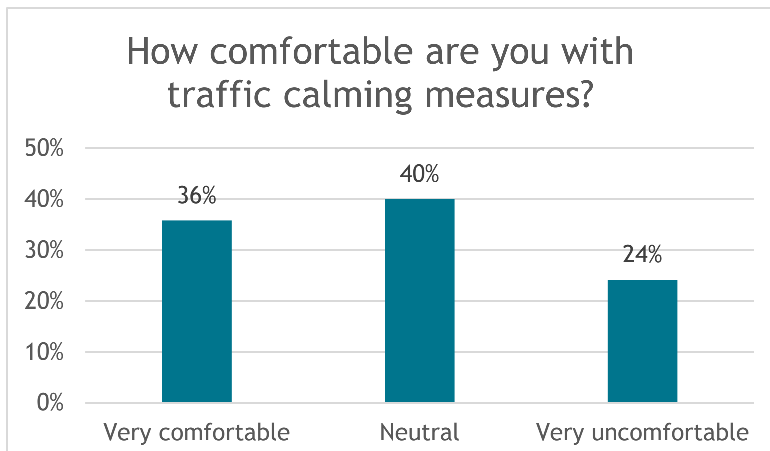
Respondents were asked to choose from a list of factors that were important to them in making the above selection. *Counts for those responses from both the printed survey and the online open house are listed here, with a list of the themes arising from the "other" answers. A full list of the comments left for this question can be found in Appendix D.*

- Improves safety for bicyclists – **126**
- Makes it easier to drive around town – **111**
- Improves safety for pedestrians – **86**
- Reduces congestions – **89**
- Promotes mixed-uses and activity centers – **49**
- Increases streetscape improvement opportunities – **50**
- Improves parking – **26**
- Other factors for US 101 – **39**

Themes for these additional factors included:

- Impacts on downtown businesses.
- Increased traffic or concerns the solution will not address congestion.
- Support for and opposition to a couplet.
- Desire for removing bikes from US 20.

Traffic calming measures

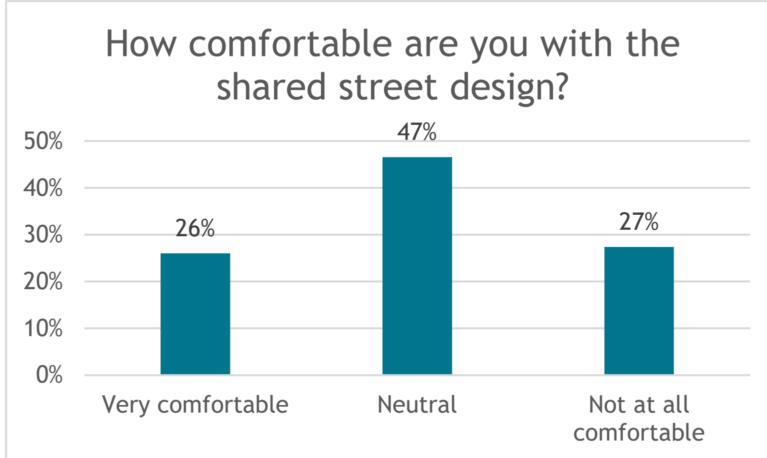


Respondents to the online open house and printed survey were asked to comment on their comfort levels with a variety of calming measures on selected neighborhood streets to manage car speeds (due to space constraints the picture of the measures were small on the printed survey and the list of selected streets was only included online). Seventy-six percent of respondents were very comfortable or neutral about the measures (**36%** very comfortable and **40%** neutral). Only **24%** were very uncomfortable.

Of the 40 Spanish survey responses, **21** selected comfortable, **17** selected neutral and **2** selected that they were uncomfortable with the traffic calming measures.

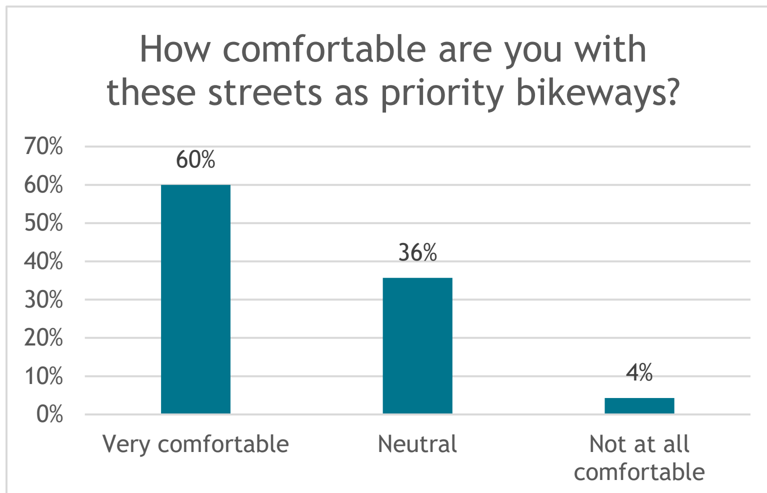
Figure 2 - Nine examples of traffic calming measures for select neighborhood streets.

Shared street design



Building off the responses from Phase 1 to improve Newport's streets for people walking or biking, the technical team developed a shared street design. Respondents to the online open house were asked to comment on their comfort level with the proposed design. About half (**47**%) of respondents felt neutral about the proposed design while the rest were split evenly (**26**% said they were very comfortable and **27**% said they were not at all comfortable).

Priority bikeways



Respondents to the online open house were also asked to comment on priority bikeway streets, as a way to create a connected system for safer travel by bike. Almost all respondents were comfortable with these bikeways (**60%** very comfortable and **36%** neutral).

Neighborhood streets or bikeways

Following these questions, respondents to the online open house were given the opportunity to share any other comments on neighborhood streets and bikeways. The most frequently mentioned themes from the **47** responses to this question are listed below. *Answers in their entirety can be found in Appendix D.*

- Concerns about bicycle safety and visibility.
- Desire for separate walking path for pedestrian safety in various locations.
- Desire for stop lights or traffic management in various locations.
- Concerns about continued congestion, especially due to future growth.

Other comments? Are we missing anything?

Many of the printed surveys had additional comments in the margins and some included attachments. *These comments can be found in their entirety in Appendix E.* At the end of the online open house and the printed survey respondents were asked to share any key projects or items they believe the team missed. These comments mostly reiterated the themes spoken to above, but a list of additional themes from the **98** responses are listed here. *Answers in their entirety can be found in Appendix F.*

- Bike and pedestrian improvements, such as lighted crosswalks and a bike path off of main roads.
- Opposition to couplets.

- Desire for plantings and beautification along US 101.
- Concerns about speeding.
- Creation and/or maintenance of back roads for locals.
- Impacts to businesses.

DEMOGRAPHICS OF SURVEY RESPONDENTS

Compared to Phase 1 outreach, respondents were slightly older and more likely to be English speakers. There was a similar geographic distribution and driving was still the most common travel option, followed by walking.

Age

Most respondents were between 65-74 (**46%** responses). A quarter were in the 45-64 age range (**23%**) or the 75 or over age range (**25%**). Only **6%** were in 25-44 and there were no responses from individuals under 25.

Of the 40 Spanish survey responses, **2** were 18-24; **25** were 25-44; **12** were 45-64; and **1** was 65-74.

Transportation

Respondents were asked to share how they got around Newport prior to the pandemic. Respondents could select all that applied from a list provided.

- Driving own car – **61%**
- Walking – **28%**
- Biking – **8%**
- Transit/bus – **2%**
- Other – **2%**

Of the 40 Spanish survey responses, **7** reported driving own car and **2** walking.

Neighborhood

Participants in the online open house and survey were asked to identify the neighborhood they live in. The most representation came from Agate Beach. The majority of those who selected “other” filled in a specific address or location.

- Agate Beach – **27%**
- Bayfront – **9%**
- Downtown – **13%**
- Nye Beach – **15%**
- Other – **28%**
- South Beach – **5%**

Of the 40 Spanish survey responses, **2** live in Bayfront; **6** in Downtown; **16** in Nye Beach; and **16** Other.

Languages spoken at home

All respondents reported speaking English at home, three respondents shared that they also speak Spanish at home and one respondent spoke an additional language not listed. Outreach conducted via phone by Centro de Ayuda was in Spanish with responses recorded in English

NEWPORT TSP: PHASE 2 OUTREACH SUMMARY

APPENDICES

Comments from the online open house and survey have been listed below in their entirety. Some comments have been edited for clarity and to remove personally identifiable information.

Appendix A: Other answers for Oceanview/Nye Street

Eight respondents selected “other” on the online open house and filled in their own answers for this question:

- A new intersection would make it difficult to transition from the extended Nye to Oceanview for vehicles. As a bike path, it could take bicycles and some foot traffic off Oceanview in a difficult area.
- Environmental impact, vehicle intersection on a curve, cost.
- It would serve no valuable purpose.
- Knowledge of the traffic pattern in the area.
- Losing car traffic on 101 hurts local businesses. Losing bikes doesn't.
- Motor vehicles already use Oceanview too much and there's no reason to force a lot of vehicles into what is now a quiet neighborhood, with a gravel road where the Nye St dead ends.
- Not a resident of this area.
- Not familiar enough with this area to comment.

Appendix B: Other answers for factors impacting US 101

Fifty-eight respondents to the online open house and the written survey selected “other” and filled in their own answers for this question:

- A couplet does nothing constructive. There isn't sufficient space for either the necessary traffic lanes or bike lanes on 9th Street.
- Both direction’s travel through the business area are paramount; bikes aren’t as important.
- Can't have the one way in front of the hospital, and if you did Option #2, the distance of the change is too short and will lead to more accidents
- Cheaper fix. It keeps 101 where it is and doesn't mess up existing neighborhoods east of 101.
- For bicycling to be appealing it must be away from 101. Dedicated bike lanes on 9th street would be a great improvement for easy/safe movement. This keeps the pedestrian activity away from busy 101 (avoiding couplet there) and allows the Farmers Market to stay in an ideal, flat parking lot.
- I think a couplet in the locations shown are a horrible idea. Really horrible. I think a "neighborhood bike route" shown running into Nye St. ignores the motor vehicle traffic on SW 2nd St., and Olive Street. People run the stop signs (especially if making a right-hand turn) or roll through that intersection frequently to constantly. Putting cyclists into that mess, particularly on crossing SW 2nd where the visibility is poor near the post office is not smart. Not unless the intersections are changed either to red

light NO RIGHT ON RED intersections. I frequently walk in that area (or did pre-pandemic, restarting recently) & have been almost hit--while in a cross walk at the Nye/W.Olive intersection numerous times. Right now the city can't even manage to maintain the sharrows on Oceanview (4 or 5 are almost completely gone/invisible) which is the route of the Oregon Coast bike route. No reason to expect the city will actually put bike lanes in any time on Nye, etc., particularly not protected bike lanes as I've seen in some cities. Are the sharrows on NW 6th street still there? Or did they disappear when it was repaved? I'd say former Council person Bertuilit's suggestions (to get rid of the parking on 101, make a left-hand turn lane) would be a better idea. So would building bypasses from NE 73rd to highway 20, without forcing vehicles to pass within 2-3 blocks of 2-3 schools.

- I think it would be best to attempt to divert all bicycle traffic off of Highway 101. These lanes are narrow in a number of places. Divert all bicycle traffic from the bridge north to Fred Mayer onto a parallel side street with bike lanes.
- I'm less concerned about traffic and more about the utter ugliness of 101 in town. Businesses on 101 need to do beautification projects.
- It makes way more sense to route bicyclists on 9th street, is way more cost effective, and does not create pedestrian hazard for the hospital campus.
- Locals use 9th Street as alternative to get away from congestion of tourist traffic to get to the rec center, city hall and hospital.
- Makes access for businesses along Ninth Street and neighborhoods on the Bay side of 9th Street.
- Spread out core development. Improve through traffic flow.
- The couplets pose several problems, chiefly access to the hospital and clinics. Even the short couplet will take away a route for locals that eases the traffic burden on 101. Far preferable to keep 101 a 2-way route, eliminate parallel parking on those couple blocks.
- The term couplet is uninformative if that means converting a portion of 101 into two one-way streets. I'm for it as it seems the only wat to avoid the congestion there. So, I'm for the change but think the city would do well to develop an elevated parking structure where the farmers market happens now, with some excavation and thought a place for events could be set regardless of weather. That could become a hub for transit and even provide overflow parking for the bay front and be serviced by the bus system.
- A turn lane on 101 in 2 block area.
- Allows both directions to flow past businesses. Bike percentage vs. vehicles.
- By removing street parking, Hwy 101 and the surrounding area will be safer and look much better.
- Bypassing the downtown shopping street will be even more disastrous for the downtown businesses.
- Concern for business on 101. The change in Philomath made business access difficult.
- Couplets would defeat side street use by locals who know when to stay off the highway at peak hours 11am-2pm.
- Danger --> Bike lanes on 101 would increase ped danger + confusion for heavy tourism traffic.
- Does not destroy neighborhoods to provide traffic throughout for tourists less than 1/2 the year.
- Doesn't bypass main businesses for north-bound tourists.
- Don't believe they are a necessity at this time.
- Far too much summer traffic.
- Having northbound 101 traffic go past the front of the hospital (long) is insane.

- I am okay with the current.
- I don't think the alternatives will improve anything.
- I like Hwy 101 as 2-way traffic. Get rid of the parking and provide nearby parking for the businesses. Direct tourists to where nearby parking is.
- Go to some diagonal parking at the business area.
- Instead of impacting 9th Street with couplets, free access by traffic to the hospital area is essential.
- It (The changes) does nothing to improve these problems.
- Just moves bottleneck.
- Keep traffic flowing better through core.
- Keeps through traffic on 101. Remove parallel parking and create dedicated left turn lane.
- Keeps traffic away from hospital.
- Keeps traffic off back streets.
- Marked.
- Must work with businesses, vehicles, bicycles & pedestrians.
- My neighborhood would be horribly affected (Pine St).
- Neither of the couplets improve traffic flow; you still have bottlenecks at the SB bridge and NB where US 20 intersects US 101. To really improve traffic, a new bridge is needed.
- No desire to turn 9th St into a freeway.
- No interest - not a pedestrian - caregiver takes me in her car.
- No parallel parking in downtown core.
- Nothing gained. Could make the problem worse.
- Reduces complexity, adding to safety.
- Reduces congestion.
- Remove on-street parking and add center turn lane for cars, and bike lane.
- Simplicity for safety for all.
- The attached article addresses the best solution.
- The couplet doesn't solve the downtown problem.
- This is a terrible idea. Just accept Newport is a small town and we appreciate the way it is.
- Tourist shouldn't take over our roads and neighborhoods.
- Traffic flow if parking is removed and left turn lanes added. HWY 101 is focused on getting through town or destinations for shopping. City center isn't a destination anymore and should be redeveloped in other uses.
- US 101 thru town could definitely use more curb appeal.
- With a focus on having apartments above shops in Deco District and better access for pedestrians and bikers (by the City, not part of TSP), this center of Newport could again become vibrant.

Appendix C: Other answers for factors impacting US 20

Thirty-eight respondents to the online open house and the written survey selected "other" and filled in their own answers for this question:

- Bike lane for highway 20 traffic is not needed since bikers do not typically use 20.

- Cheaper fix, less confusing and safer for drivers and pedestrians.
- Couplet a good idea but couplet should intersect Hwy 101 rather than a bottleneck connection.
- How are cyclists supposed to get to those bike lanes and where will they lead to? It doesn't do anyone any good to plop down a "bike lane" for a few blocks when riders would end up where? On 101 going north? Avery until it dead ends going north? Back onto route 20 along stretches where there's hardly a paved surface between the fog line & trees/a steep slope? And what about all the vehicles that turn off of 20 onto NE Coos? Heavily used by vehicles to bypass 101 until you're forced back to 101 at NE 11th (NE Benton effectively ends there). Will a stop sign (which drivers will ignore) be placed at the intersection of NE Coos and NE 1st to protect cyclists from vehicles speeding north on NE Coos? Doesn't anyone pay attention to current traffic patterns in Newport? Want to do something for everyone? Fix the intersection of NE Harney & 20, put in left hand turn signals on BOTH SIDES of the intersection and GET rid of right on red on NE Harney so that pedestrians might actually be able to cross 20 safely at that location. Extend the sidewalk ALL THE WAY to the intersection & down Moore. Both sides of Moore.There's not even a full sidewalk network from that intersection, along route 20, going west to the 101/20 light. How about building one? And putting in some planted space between the sidewalk & 20 so people aren't asphyxiated by fumes & noise as quickly as they are now--along that sidewalk that has yet to be built?
- I don't see how these options address anything.
- Locals now use 1st Street to avoid tourist congestion at 101/20 intersection, makes it easier to utilize businesses in area.
- Neither of these options helps the congestion at the actual confluence of 20 and 101.
- Neither option seems to make that significant of an improvement to pedestrian/bike safety nor does it sound like it improves the streetscape, something I think 20 desperately needs as you enter Newport from the Valley and see the ocean (an awesome view).
- This gives businesses along 1st street access to be able to egress from their businesses and not be blocked by a busy highway running right by their doors.
- Traffic going past businesses helps them which helps the city. Don't change their routing.
- Bypassing the downtown shopping street will be even more disastrous for the downtown businesses.
- Cannot see that splitting 101 will help, it would make it more confusing.
- Causes congestion on either end of "couplet".
- Continue the couplet on NE 1st all the way to the intersection of US 101.
- Couplet makes no sense if the lanes merge again before the 101 highway.
- Couplets result in high-speed traffic.
- Don't see any problems on Hwy 20.
- Ease at access. Proceed in a left-hand circle to curve any destination on the couplet.
- Expense of land purchase and push of traffic towards residential neighborhoods and heed start bldg.
- Helps to make the center of Newport a vibrant area, not just an intersection for cars.
- I am ok with the current.
- Increased bicyclist safety.
- Increases traffic through mixed commercial/residential areas.
- Keeps traffic out of the neighborhood.
- Marked.

- Must find a way to help merchants w/ this.
- New 1-way routes too disruptive to neighborhoods and businesses.
- No couplet
- None
- None of the solutions improve pedestrian experience.
- Other selections are too expensive.
- Others are not improvements
- Proposal doesn't appear to improve traffic flow, especially the idea of a couplet getting right back to an impacted area
- See other above.
- Stop making tourism a priority, please!
- Stop the couplet nonsense!
- The changes would not help.
- Unfortunately, the long couplet would hinder using merchants for north bound traffic.

Appendix D: Additional comments on neighborhood streets or bikeways

Forty-seven respondents to the online open house shared these additional comments:

- Any pedestrian/bikeway between CR13 (Oceanview Map, existing crossing to Walmart) and N 52nd (out to Yaquina Head) should be on the EAST side of 101. The majority of residences (current and future) are on the EAST side. There should be NO MORE 101 CROSSING POINTS FOR PEDESTRIANS/BIKERS between these two intersections. The new paths could connect with the existing loop trail on the EAST side that goes down to Agate Beach Wayside. Please do not put a pedestrian/bike path on the West side along this stretch. It is too difficult NOW, for drivers/bikers on the West side of 101 to get out onto 101 (particularly heading north), due to heavy traffic and poor visibility in both directions, without also having to look out for pedestrians and bikers coming along a dedicated pathway (going either direction) on the west side of 101. We've had many accidents and at least one pedestrian fatality at Wade Way and 101.
- Bicycles never stay where they are supposed to. On roads they are hard to see and a danger.
- Bike lane between Y Head and Oceanview Drive. Use the current power easement.
- Bike lane from Agate beach just west of 101 and the east of the houses
- Consistent sidewalks, try to traverse Nye St on the East side from Olive St to 16th St the sidewalk where it exists at all is covered with Blackberry diverting most pedestrians into the street. As a disabled person I find walking in Newport to be dangerous and daunting, the public transportation is laughable, I was turned away from a bus for not making an appointment to catch the public bus, the ride share is also fraught with people who don't care and forgotten pickups. I have failed to make medical appointments that take a month or better to reschedule, then to make an appointment to use ride share, one has to call in with a few weeks' notice but never over a month in advance. Your system is flawed and the public Cab service is little better many times they have not been available even before Covid began the problems were there.
- Controlling traffic and enhancing pedestrian and bicycle use on Oceanview is critical. It is extremely dangerous. Speeds are often extensive as people use the route to get around 101 traffic.

- Fix the timing of the traffic lights on Hwy. 101 to prevent the unnecessary congestion of vehicles in Newport. If it's ODOT's fault, get them to redo it right this time. This would help everything, including bicycle safety. Change the rights things. Not the wrong things!
- From Hwy 20 on Benton Street - onto Angle Street, then to 9th Street - and all the way to the cutoff on 101 (just next to the hospital) ...is a very busy thoroughfare. I live on Benton Street, and if there were any way to SLOW TRAFFIC DOWN at the corner of SE 2nd Street and Benton (LIKE PUT A STOP SIGN OR A LIGHT), it would be MUCH appreciated. Accidents happen there all the time, as well as pedestrians almost getting hit on a daily basis. It's a horrible place for a crosswalk to Oceana/Rec Center side, when people tend to go 35-40 around to the top of the curve. PLEASE INSTALL a STOP SIGN at the LEAST. PLEASE.
- I live in Agate Beach and walk to the Yaquina light house enough to know how dangerous it is for walkers along Lighthouse Drive. IT IS SCARY due to lack of physical separation between the edge of the road where pedestrians are forced to walk, and vehicle traffic - which is typically traveling at high speed as cars transition from Hwy 101 (45 mph) to Lighthouse Drive (posted as 25 mph). Ideally, PLEASE create a separate WALKING path completely separated from Lighthouse Drive (by distance/barriers) and running from the intersection of Hwy 101 to the west end of Lighthouse Drive (at the Lighthouse), so that walkers can avoid danger from automobiles. Also, please work with BLM to install speed bumps, rumble strips, and/or radar speed indicators along Lighthouse Drive to slow cars down.
- I live in agate beach and walk/run in the area regularly with my dog, daughter, my wife, friends, etc. and have had MANY very close calls at the intersection of 101 and lucky gap due to speeding. I want to recommend speed bumps on the portion of lucky gap that is north/southbound. Lots of cars speed on the street, and there is a blind curve leading to 101, and people try to "beat the light", which is when myself and others have all had close vehicle vs. person collisions. Thank you.
- I would like to see a cross walk with flashing lights on highway 20.
- I'm very concerned about speeding on roads that are designated shared space for bikers and pedestrians. Specifically, I live on Oceanview Drive and the speeding is very dangerous. There are many pedestrians and bikers on that road, especially near Agate Beach State Park, and it is not safe for bikers and pedestrians. Speed bumps, one way traffic, other measures are necessary to give more room for bikers and pedestrians.
- In Agate Beach, the city should be aware that Tim Gross, the former public works director, put a CURB in where NW Gladys, shown as a "connector street" on the map, should enter NW 58th St (shown on a plats of that area). Why did that happen? I'm fine w/Gladys being a pedestrian connector but do not see the point of it being a bicycle connector, why would a cyclist ride there instead of on 101? I would focus on building an OFF ROAD but adjacent to 101 multimodal (bicycle, pedestrian, mobility scooter) path from the north city limit into central Newport. There is a RR right of way on the west side that provides a great location for such a path. There is also inadequate explanation of what a "priority bikeway" means in terms of what will be provided for cyclists. Or what kind of traffic calming devices will be used to make it safer for pedestrians too. Right now the city can't manage to maintain the few sharrows it's got, it has shown almost zero regard for cyclist safety (pedestrians too), so what's proposed in this TSP seems to be aspirational only, we'll say we'll do it but it'll never happen. On the Yaquina estuary, the "priority bikeways" don't connect, so people can't ride one route going in one direction, another returning even though there are streets that would enable them to do so. The city

needs to think in terms of people using bicycles for TRANSPORTATION, daily transportation, same way motorized vehicles are used. The Oceanview map shows huge gaps in a priority cycling network--cyclists, like everyone else may want to minimize energy output by being able to travel along the shortest line to their destination, so that network is clearly inadequate--it does not implement that principle. Downtown area shows same deficit as the Yaquina estuary, there is no real network, there are multiple legs that just end. What happens then? The cyclist is dumped into a mass of motor vehicle traffic?

- In favor of getting vehicular traffic off Oceanview Drive between NW 12 to Agate Beach to increase safety of pedestrians and bicycles on Oceanview Drive. In favor of connecting north/south traffic from Oceanview Drive onto NW Nye.
- In particular, Oceanview has a lot of cars, many of whom travel very fast through the more northerly section. The parking that occurs on the side of the road around Agate Beach Wayside creates a danger to the occupants getting in and out of the cars. The speed limit needs to be less and probably no parking allowed beside the road, no matter which option of road design is chosen.
- "INT7 (right in/out only) is very worrisome. While I understand the hope is to limit congestion on 101 by doing so, changing this intersection will severely limit residential neighborhoods between 101 and Bayfront from safely and easily accessing 101. Likely traffic from these neighborhoods will fall onto SW 10th and SW 11th street, which is very residential and has no traffic calming measures proposed, to access 101. Please consider an alternative solution for the sake of long-time residents in these neighborhoods.
- Making 9th street a priority bikeway sounds great if 101 does not become a couplet. It would be a fantastic solution. Keeping cycling off of 101 and providing a parallel and relatively flat path for bicyclists is ideal.
- Disappointed to see the shared street draft image. I think the only way to make Newport enticing for walking and bicycling is to provide a path separated from the road (separated by curb, vegetation, or something else). This image seems to depict a 'sharing of the road' situation, which never seems to increase walking or bicycling appeal.
- I believe 9th and 10th street should be classified as a neighborhood collector and not a major collector simply because of the hospital and Newport Recreation Center pedestrian activity. Already vehicles are driving too fast on these roads, especially 10th street, making crossing the street and pulling out of the Rec Center parking lot dangerous. They should be classified as neighborhood collectors to allow for measures to manage the speed of vehicles.
- It is difficult to see the illustrations and assess how they would work. We have WAY too much traffic at the intersection of Hwy 20 and 101. There are too many vehicles backed up at the lights, too many trying to make turns on the off streets. It would not be safe for bicycles to be there at all. The pedestrian crosswalks with blinking lights aren't even safe. I have seen way too many cars not stopping when people are crossing!!!!

  1. Trucks, RV's and other large vehicles need to be redirected some other way to 101 and away from the main intersections and avoid driving in town as much as possible.
  2. PRIORITY issues after Covid decreases but start now:

     a. Need electric buses and more is a must! (first on agenda) More bus stops (covered for the winter climate) better routes to encourage more use. The dial a ride works well but one person per bus is not energy efficient. The regular bus schedule is complicated and trips take too long. No one wants to take all day to go to one or two stores. We need to encourage more bus use. That would free up the roads for more bicycles also.

b. Electric shuttle buses for tourists.

c. Speeding. Have more speed signs with fines listed on them and enforcement. People drive like maniacs without much consequences. Can your volunteers with the police give speeding tickets?

d. Where is the education? EVERY license renewal should require a manual test with all updates of new traffic rules and old ones that people are not abiding by! And those questions to be on every exam.

- It would be nice if the Toledo business 20 intersection at the DQ would be addressed. Perhaps a roundabout could be built to create a better flow for traffic?
- It would be nice to someday have a bike/walking path that connects all the way through Newport that is not accessible to cars so we can feel safe riding and walking.
- Oceanview should be closed to through traffic except bikes and peds.
- "On ""TR6"", I think you would have more use of that route if it were to connect to Fred Myer/Safeway area via Frank Wade Park. I do this all the time. Otherwise, for that section of town, the only way to get to that part of town from the NE section is on the HWY. Also... 101,(in my opinion) should be avoided as an option for cycling at any point in the downtown area/core. I've ridden in Newport most of my life (I'm 61). Lastly: an improvement in the 1800 blk of Ocean View Dr by widening, even a few feet, would improve pedestrian and cycling safety."
- Overall in all area maps, there is too much emphasis on bikes considering low bike use by Newport residents. Priority should be on improving bike safety route most bike tourists take from 101 on Oceanview through Nye beach area to the Bay bridge going south and through South Beach.
- Please take this opportunity to add some beautification to our town. Most especially the downtown core where not only is there no apparent landscape plan, but vacant buildings are allowed to decay.
- "Re: Agate Beach .... Is this about residents' or tourists' needs/safety?
  Your informants' identification of ""neighborhood street collectors"" in Agate Beach, i.e. 55th NW & Gladys, is specious. Gladys does not even go through from 55th to 60th, though it needs to.
  58th has more, faster traffic and more children/pedestrians than 55th.
  But then it is mostly residential, i.e. not so much for tourists other than a few modest rental.
  55th is gravel and obviously rates attention as it goes to the posh houses.
  58th is paved to the 300 block and direly needs speed bumps/limits and children-crossing signs."
- Regarding the Oceanview Connection to Nye St, only one choice was allowed. We like both Full Street Connection and Multi-use Path (no vehicle), but since forced to choose, went with multi-use path because we think it will be easier for the city to implement.
- Regards to the Electric car charging areas, how about the old Chevron gas station next to City Hall? That would be a great location for another EV charging station.
- Shared streets option looks fine, but I would prefer the buffer between the cars and pedestrians to help protect pedestrians from cars losing control and hitting them.
- Some of these plans would be easy to establish. There is no way to enhance bicycles going across the Bridge. There is ample room to widen 101 south of the bridge and North of 20th street. Planning needs to look further to the future not just try to fix the issues that there are right now.

- Some years back, Golf Course Drive was slated for basic improvements to meet city codes. Are those plans still going to be carried out?
- South Beach residents need improvements on SW Jetty Way to more safely separate bicycles/pedestrians from vehicles entering and exiting the day-use area of the state park.
- SW 2nd needs a sidewalk on the North side for pedestrians walking to work at hotels, families going to the beach and playground, and locals walking to and from services on 101. The road is wide enough there could also be a bike lane. The intersection of 2nd with High-Alder-4th needs to be calmed with speed humps or something. Cars speed around the corners and it is a confusing intersection, especially with the odd-angled intersection with 3rd just beyond that. It is also the ambulance route to 101 from Nye Beach, so it needs to be made safe somehow. Thank you!!!
- "The bicycle/pedestrian improvement seems to fall short on SW 2nd street and should go all the way to the 101 and Angle Street intersection. Lots of pedestrians crossing there so it makes sense to do so to help the current flow of pedestrians and bicyclists.
- Perhaps consider some 'enhanced crossings' to be under the highway (101 or 20) or to be over the highway. Seems like one in Oceanview section for 101 crossing and one in Downtown section for 20 crossing would be ideal. Boulder, CO has under highway crossings for bike paths and it makes for a super bike friendly and safe feeling place.
- The shared street design looks like it will create one-way streets? If that is the case, I am disappointed that this is the direction the city is leaning towards especially when this one-way incipience does not result in dedicated bicycle only paths or buffer vegetation to separate the vehicle traffic from the pedestrian path."
- The first block of NE Harney St north of Hwy 20 is dangerous for bicyclists (narrow--very poor-quality pavement) and needs to be widened. Also, signal light triggers for bicyclists are needed at this intersection (Hwy 20/NE Harney-SE Moore) especially at the SE corner. The pedestrian one is too far to be easily reached on a bicycle due to placement and curbs.
- The long and short couplet ideas are just really bad ideas for Newport for so many reasons.
- The maps are difficult to decipher without any street names on them.
- There needs to be more pedestrian crossings, either stop lights or at least flashing lights, across Hwy 20 between 101 and the current pedestrian crossing near Eads.
- "Think about partnering with Newport High and the art program and make 3-D crosswalks on Eads. If successful, then do it on the Bayfront and possibly Hwy 101! 3-D crosswalks in Iceland
- Traffic circles are a poor solution for traffic calming. Many I have seen have been abandoned for 4-way stops.
- Very concerned that paving 55th Street will increase speeding and congestion. In favor of including several speed bumps and other measures to slow traffic in the Agate Beach neighborhood.
- Very difficult to turn West onto 20 from Fogarty SE. Very unsafe to cross as a pedestrian at this intersection as well! I'm sure it's similar for most of the side streets connecting highway 20. Need lights or roundabouts to help with long wait time and unsafe merging, especially during high tourist times. It's a priority to create safe bikeways. I've seen them in other towns and the lanes are colored green.
- We live in the Agate Beach community and have 2 non-drivers (by choice) in our family. My wish for Newport is that there is a designated pathway for pedestrians and bicyclists along Hwy. 101 (such as the one in Corvallis along Hwy. 20) that starts around NW 60th Street and leads into Newport. There

are so many speeders and distracted drivers along Hwy. 101, my 2 walkers in the family feel it's not safe to travel along Hwy. 101 on foot. If I'm looking at the map correctly, this looks like it may be in plans??? Also, we have a lot of tourist traffic coming off of the highway and flying down NW 55th and NW 56th Streets, many times ignoring the stop sign on NW 55th. They're trying to get down to the parking area on NW Pinery/NW 55th Street to view the lighthouse/ocean or go surfing. It would be nice if there was a traffic calming solution for these two streets. We've lived in this neighborhood since 1993, and it seems to be getting worse in recent years.

- We need to slow down traffic on Lighthouse Drive AND make provisions for separation of biking and pedestrian traffic from speeding vehicle traffic in this area.
- "Who is more important? The businesses struggling to eek by or the few bikes traveling north and south that could very easily change their path to quieter streets. Try doing that with a truck or large RV. Can't be done. Leave what works. Who was the Einstein who brought this up?"
- Why are there no enhanced crossings on Hwy 20 and Eads or along the Hwy 20 to 101 section? There are kids and people that try to cross all the time, especially when school is in session. The same goes with people crossing at the Eagles and Shell while cars are stacked at the lights. Traffic congestion is one issue and speed on Hwy 20 is another issue, I would like to see these addressed in this conversation as well.
- With limited funding available, I suggest we focus on a handful of good projects that could actually be implemented within the next 10 years. There are so many potential bike improvements listed the vision is muddled and not focused.
- With the new addition of apartments near the Big Creek neighborhood, traffic congestion is going to get serious at the intersections of the entrances from 101 (31st especially, but also at 36th). It's already an issue pulling out onto 101 during the summer, and with that addition of hundreds of new residents, it will be ugly. Plus the fact that the little road on 31st is already dangerous for bikers and pedestrians, I think those areas should be considered in this overall plan, but I didn't see much on the Oceanview map to show improvements to these areas.
- You employ a lot of jargon and limited choices of response throughout this presentation. The couplet proposals don't seem to really address anything; they leave all the same bottlenecks that exist now. Identifying ""priority bikeways"" is fine, but what exactly will you do with them?

Appendix E: Additional written comments

Forty-one respondents to the printed survey wrote in additional comments on the margins of their surveys.

- 91-year-old
- And continue couplet all the way to us 101
- Arrow to short/long couplet: absolutely not
- Attachment: pg. 11.43 "Proposed Route #4?"
- Attachment: pg. 11.46 cutout from newspaper
- Circled speed cushions and speed hump and wrote "no"
- Circled Speed cushions; Longer crossing lights for disabled persons/and people on wheel-chairs!; Not SE 9th/Government
- Circled speed hump

- Circled speed hump: Coming down 3rd to Birch
- Ease; 513 NW 9th, Newport (Actual)
- Eliminate parking in downtown core street/101; put in turning lane at Hubert; bike lane not needed for Highway 20 traffic
- If traffic separated, only 50% are flowing through district causing only southbound traffic to see shops.
- Make pix bigger :(
- Marked X over traffic circles - Poor solution for traffic calming
- Multiple selections: 45-64, 65-74
- On maps of US 20: "Are the yellow circles traffic circles?"
- On Q2: Remove street parking on Hwy 101 and put in turn lanes.
- Other transport: "Would use with transit/bus with improved service, perhaps more frequent mini-buses, particularly in summer for tourists."
- People speed in that area now. They will continue to speed. Now they will have more room to speed. (unreadable)
- Q1. "creates hazards"
- Q1. "some people don't stop for pedestrian lights." Q2. "I don't understand this very good."
- Q1: "don't like any."
- Q2: "eliminate parking on 101, but where is parking for businesses in those 2 blocks?"
- Q2: "eliminate street parking on 101 and make turn lanes."
- Q2: "turn lane from both directions."
- Q2: crossed out "with dedicated bicycle lanes on 9th Street"
- Same as now!
- Scratched out neutral "OK, if well thought out and necessary; smart planning can improve existing traffic flow; I drive everywhere"
- See attached article, could not say the solution any better!!!
- Selected two-way travel and short cuplet (US 101 option)
- Speeders! Have requested a 25 mph solar sign but nothing yet!
- Sticky note attached: Resident and visitor concerns re: 26th St access to So. Beach State Park and beach/jetty area. Currently 26th St. is used by RVs, trucks with trailers, pedestrians, mothers with strollers, bicyclists, etc. A shared use path as an extension of the existing path around Rogue is desired for public safety and enjoyment of visitors and residents alike. Extend it to the end of jetty without excessive cost or environmental impact. I think that Newport should adopt a transportation goal to be carbon neutral by 2035.
- Sticky note attached: What is missing here is all effort to reduce carbon emissions by making public transportation available to more people. Can be done with a mixture of buses and vans. Bike paths are very important.
- Thank you for this input opportunity; Wish I could read the streets. It's too small to see!!; Same Q; What is streetscape?; See Q#2 9th street; Redundant Q
- The bump-outs are dangerous and ridiculous!
- The only thing they wrote on their survey were big red Xes over the couplets on the US 20 maps and on the "traffic circles" image.

- The only thing they wrote on their survey were big red Xes over the couplets on the US 20 maps and on the "traffic circles" image.
- Totally circumstantial to each event
- Underlined "makes it easier to drive around town"
- Wrote "no" across "with dedicated bicycle lanes on 9th street;" wrote "maybe" on improves safety for peds and improves parking. Bicycle community uses to many highway (unreadable) from traffic improvements. Bicycling makes up less than 2% population and bicyclists contribute little (unreadable).
- Yes - thank you!
- Your maps are too small - What is a couplet?

Appendix F: Comments for "Are we missing any key projects?" "Are we missing anything?"

Ninety-eight respondents to the online open house and the written survey shared additional comments:

- Additional off street parking options for 101 through downtown with street improvements to encourage visitors to get out of their vehicles and eat and/or shop, whether they are coming from the north or the south. Eliminate on street parking from SW Fall through Angle to maximize visibility of businesses? Flowers on light standards? Planters on curbs?
- Again, it is important to me that we show some pride in our town. You only have to look at our neighboring towns to see what can be done.
- As mentioned above, South Beach residents need safe pathways along SW Jetty Way to separate pedestrians and bicyclists from motorists accessing the South Jetty day-use area of the state park.
- Bike and ped trails should connect neighborhoods so people can commute to work, shopping and play.
- Harney Bypass
- I did so above.
- I feel there should be more lighted crosswalks between Hurbert and the bridge on Hwy 101, it would make it easier for people who walk and bike to be able to get across the street.
- "I have never heard of a pedestrian friendly street that doesn't place the BUFFER between motorized traffic and pedestrians, yet one of the city's examples of a street does just that. I see little to demonstrate any commitment to creating a complete sidewalk network and/or off-street multi-modal transportation network so that people can safely, maybe even pleasantly use walking or cycling as their primary mode of transportation. Without having to walk or ride twice as far as motor vehicle drivers drive to get to their destination. Will these proposed networks bring people from Agate Beach (particularly north of Yaquina Head) to workplaces in SAFELY and as directly as possible (short a trip as possible) into central Newport? If not, then the plan is fatally flawed as it does not provide people with other ways of getting around other then motor vehicles. You want to make 101 less congested? Then get people out of their vehicles. The city can do that funding a GOOD bus system that full time workers, and shift workers can take to their jobs, meaning the bus goes from residential to where most of the jobs actually ARE in Newport, and/or the city can make it as easy as possible for people to walk or cycle or use a mobility scooter or electric wheelchair. Right now, people risk their lives & health cycling and walking, using electric wheelchairs, immediately adjacent to all the huge trucks, RVs, BIG pickups, and other motor vehicles on 101. As in 3 feet away. The area outside of the fog lane, if paved,

is NOT kept cleared of trash, pebbles, small rocks, to make it safer for cyclists to use. Many vehicles travel at speeds greater then 45 mph from Moolack Beach to the light at 25th street. I have not seen any proposal in this plan that will make it safe for people to walk/cycle along the most direct route into town, ie., 101. If that's what's provided for drivers why does the city refuse to provide the same direct route for pedestrians & cyclists--a SAFE route. Maybe even one that's not unpleasant due to the roar & fumes of traffic.
  All I see are piecemeal solutions. I have seen no proposals to improve or greatly expand the sidewalk network, not even in central Newport. The proposed couplets are horrible ideas. I would suggest building true bypasses, like from NE 73rd to route 20, so that only those people who WANT to come into Newport come into the central part of Newport. Anyone who's wants to get only to 20, could do that on a bypass, that would include some huge trucks, etc. The couplet would not help anyone get through Newport faster. Anyone who's driven the couplets in Philomath knows that, all that's happened is that some formerly residential areas are now exposed to alot more exhaust and noise pollution and it's far more dangerous for them to cross what used to be a far less traveled street. Both proposed couplets will increase the noise & pollution of vehicles near the hospital, hard to imagine how the city could think that would be a good idea or good for the patients."
- I hope that as the housing opportunities continue to grow in Newport as new developments pop up, consideration for congestion mitigation becomes a requirement. As the number of places grow on the northern end of 101, safe ways to enter and exit the highway should be considered BEFORE it becomes an issue and people get into wrecks trying to pull into relentless traffic.
- I live just outside Newport but am in town almost daily. I think the biggest problem is 101's incredible ugliness. I have joked that Newport's motto ought to be, "Not quite as ugly as Lincoln City." We need a plan to slowly change 101 so its businesses put parking in back instead of in front and do much much more to with plantings and other beautification measures along 101.
- I shared my Hwy 20 concerns in the past section.
- I would like to repeat my opposition to making 9th St one-way. It compromises access to the hospital and clinics, takes away a valuable option for locals to bypass the seasonal congestion on 101, and is a costly and disruptive project. Instead, eliminate the parallel parking on that short stretch of the highway. Put bike lanes in its place and locate additional parking spaces nearby.
- "I would love to see a focus on funding and implementation for all of the solutions included in the final TSP. Many of the bike and pedestrian improvements proposed here were included in the previous TSP and remain unbuilt. I also think it's important to prioritize projects to some extent so the city has a guide to phase in and fund changes and improvements over time. Lastly, I am in favor of the couplet concepts but only if they do not add any more travel lanes or widen existing lanes. If the focus continues to be on moving more vehicles through Newport at minimum speeds of 35-45 mph, the city will be planning for more of the same: promoting dangerous conditions for pedestrians and cyclists and creating non vibrant, unattractive and unwelcoming auto dominated streetscapes along the “gateways” of hwys 20 and 101."
- I've lived in Agate Beach for greater than 10 years and have not used my bicycle once since moving here. Whereas before that, I was an avid road bike rider. The reason I do not ride now is that Hwy 101 is just too dangerous for me. If I want to ride anywhere, I would have to load my bicycle and go somewhere else. I would love to see a secondary route parallel to Hwy 101, or a dedicated bicycle path that is completely, physically separated from Hwy 101, running from the traffic light at the

intersection of Lighthouse Drive and Hwy 101 south - all the way to the Oceanview area where connections can be made with other routes to completely avoid having to ride on Hwy 101. That would be enough motivation to get me back on my bike.

- Let me toss this in, build a light rail system to connect Newport, Lincoln City, Toledo and Siletz to start, this could be a project for the Tribes to become involved with, Imagine Grand Ronde setting a line to Salem to connect the coast to the valley. Just a thought. Better overview of the offered public transit Busses and Cabs should run on time provide dependable transit and get rid of the more offensive drivers.
- Many years ago there was serious talk about connecting Nye Street between NW 16th through to the north. This would help create a back
- Pedestrian path from recreation center parking lot to SW Hatfield Dr. People have created paths there already, preventing vegetation and increasing chances of eroding the hillside.
- Plans should focus on keeping traffic on 101 flowing through Newport with synchronized traffic signals and by not adding many more pedestrian crossings. Priority for biking should be on making biking safe for tourist biking on Oceanview.
- Please see my previous comment about installing a STOP sign, or a traffic light at the corner of SE 2nd Street and Benton Street. It is a VERY dangerous corner. Many accidents happen there, and pedestrians cross that road all the time in the crosswalk.
- "Strongly against a Highway 101 couplet (short or long). Strongly against roundabout at Highway 101 & Highway 20."
- The light by Szabo's has created traffic backed up to NW 36th Street (or a few times back past the light at WalMart). During heavy traffic flow times (summer, spring break, etc.), maybe adjust the traffic light so it stays green longer for the highway traffic to flow and have those turning onto the highway coming from the east and west making a left turn wait a little longer. Just one thought. There may be a better solution than this, but it has been a problem for us locals just needing to make a quick trip to the store to pick up a few items.
- "This survey is about transportation but I do not see anything about improving the poor bus availability in the 'off' season. Especially for people living in the low-income housing north of town. How are they to get home in the off-season other than walking/hiking in the rain/dark?"
- Very difficult to visualize the proposed improvements shown in these simple graphics.
- Very opposed to 101 couplet. It doesn't seem the expense of creating it, the negative effect on residents between 101 and the Bayfront (increased traffic, noise), or the one-way street inconvenience for drivers on 101 would be worth the benefits that are predicted from creating such a change. Please do not create the couplet.
- Where is the public transit option?
- #1 Will a stoplight be added at Hurbert and 9th St. #2 Desperately need additional parking and possible shuttle for tourist areas. Shuttle can pick up and drop off Nye Beach, Bay Front, Aquarium, etc.
- Additional light on Hwy 20, maybe on Eads St.
- Alternate 101 routes disrupts community ambiance and disrupts residential areas and negatively affect businesses.
- Any couplet will by pass businesses.
- Bridge is really the actual bottleneck

- Bypass from Hwy 20 to Big Creek Res. Taking the pressure off of Hwy 101. Making this bypass autos only, no heavy trucks/trailers/RVS/becoming safer for students.
- Can we reset the lights so more side street exits and turns are not held up for 7-8 mins
- Cars speed up and down NW Coast!!
- City bypass before reaching Hwy 20/101 junction.
- Consider using traffic circles instead of stop lights.
- Consider which solutions are doable in the near term rather than always reacting for a future vision.
- Costs on Hwy 20 and 101 intersection.
- Couplet adds unnecessary complexity and dangerous conditions.
- Couplets are a nice ideal however I'm concerned about re-routing cross traffic and congestion of the ends.
- Don't use the bus
- Downtown is horrible - hard to park. I rarely shop there. Also dangerous trying to get out of car or parking spot.
- Eliminate parking along 101 from Hurbert to Columbia Bank
- Extreme congestion on Hwy 101 during summer months - cannot turn left from NE 71st
- Forget the traffic circle @ 101 & 20!
- Harnet Bypass
- How are you proposing to SLOW traffic in 101 from Walmart to Hwy 20 intersection? Speeding trucks are HORRIBLE
- I have property on NE 1st street/property value decreases with couplet
- I never ride the bus so I don't know what would suit a commuter or visitor
- I think building roundabouts on Highway 20 and Moore as well as Highway 101 and Highway 20 would greatly facilitate traffic.
- I think we should have a regular traffic light at 101 and SW Angle. Some people don't stop for pedestrian lights.
- I think you should deal with our aging bridge and then work on traffic flow.
- I would like to see a traffic mgmt project put into NE Big Creek Road. Speeding and going down the wrong way road is norm. People doing doughnuts in gravel - high pedestrian use walkers, joggers, bikes - including families - small children etc.
- I would need more info. Whatever you choose it will not reduce number of cars, etc. More every day, year.
- If something is not really broke… don't try to fix it; the real problem is overpopulation!
- I'm assuming pavement improvements would be made on NE 1st for the couplet option
- Improve/create pedestrian sidewalk from fairgrounds/high school to/past Elks on Harney/Moore, west side, for safety.
- It is not at all clear where the "eligible streets" can be seen online within the website. Regardless, there are several 3-way stops at 4-way intersections that would be well-served by traffic circles.
- It's not clear how this would affect (solve the bottleneck) at 101-20 intersection
- Maintain gravel roads - cutting grass and bushes encroaching on roadway! SW 11th and Hurbert.
- Make a back roads route for locals. Do this by changing the direction of stop signs and putting in a stop light on Hwy 20!

- Make every dollar spent improve conditions for every interest - simple - not easy
- Making existing residential areas a highway is horrendous
- Making existing residential streets A (Hwy 20 or 101) state highway is a horrible idea!
- More bike lanes
- More options on #5 above
- NE 1st St at 101 should be a right turn only - also would like to see photo traffic ticketing @ 101 and 20
- Need a pedestrian light at Eads & 20
- Need more parking areas. If we are a tourist town we need some place to park their cars other than the city street
- Need turning lane at Avery and 101 (or middle lane)
- News-Times Aug 11 2021 "Viewpoint" I agree on all points!!!
- No street parking on 101. Clean sidewalks. Put in more left turn lanes. Light at 40th for OCCC students. Light on 101 to exit hospital.
- On Hwy 20/1st couplet have west lane on 1st - right turn onto Hwy 101.
- Our traffic on 101 both N& S very heavy - hard to get out onto HWY from Avery St 71st or 70th
- People who buy things do so from a car. Retail street locations are for shopping.
- Please fix the Harney St/Hwy 20 intersection as a priority. Don't use bump outs like in Nye Beach or roundabouts.
- Remove on street parking from US 101 downtown. Then widen traffic lanes.
- See my comments above
- Stop sign at NE 8th and Benton. Too much speeding on NE 8th. Several recent collisions
- Synchronize stop lights on 101 to keep traffic flowing (as in downtown Corvallis)
- Take care to recognize the influence on those business which may lose customers due to a couplet.
- The attention to rural streets in Agate beach.
- The intersection at Hwy 20 and Harney. This is a VERY dangerous one and should be modified.
- The left turn on Avery & 101 - impossible to get out, we need a turn lane.
- The main problem is where 101 goes through downtown starting with the Armory and ending at Hwy 20. None of these (unreadable) solve that problem.
- There need to be more signs or markers on our roads and streets for all the idiots making terrible u-turns.
- There was no mention of traffic control by utilizing enforcement lights, directional ??? (pg 30), with clearly marked lanes, etc. mentioned in survey. What was the overall focus of this ????
- Tourists driving 101 can see entire downtown business area.
- Transportation won't take climate change into account.
- Turn lane on 101 instead of couplets.
- Uniformity of building colors and designs and beautification ie, ??? in concrete pots (p16)
- US 101 and US 20 junction needs to get pedestrians across without putting them in crosswalks!
- We're at a time where hwy/street funds are at a premium. We cannot commit funds to anything by traffic and sidewalk. ??? (p6)
- When you make maps so small it is difficult to figure out where the streets are!
- Would there be parking on both sides of the one-way streets?

- Yes bayfront traffic!!! Perpendicular parking - cars only! Parallel parking and lot parking trucks only!! Truck and parking makes 2 lanes and traffic impossible
- Yes, where I live it would impact our ability to get out of our neighborhood - Hatfield evacuation??
- You don't get it! Couplets increase complexities on and off to two way travel
- You need one or two flashing crosswalks like on 101! It is practically impossible to cross 20 on foot or bike! One by Coos and one by Eads.

APPENDIX M- CITY OF NEWPORT TSP STORMWATER CONSIDERATIONS

Job No.: DKS-40

Date: February 15, 2022

To: Carl Springer, PE, PTP – DKS Associates

From: Ben Austin, PE

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

Project/Subject: **City of Newport TSP Stormwater Considerations**

☐ Fax - Number:_________________; Number of pages___________
(If you did not receive the correct number of pages, please call 503-221-1131)
☒ E-mail ☐ Mail ☐ Hand Deliver ☐ Interoffice

Background and Purpose

The City of Newport is currently updating its Transportation System Plan (TSP). The purpose of this memorandum is to provide supplemental considerations related to stormwater management as part of the implementation of transportation improvements recommended in the TSP.

General Considerations

The City of Newport Municipal Code states that drainage facilities should be designed to consider the capacity and grade necessary to maintain unrestricted flow from areas draining through the land division and to allow extension of the system to serve such areas. In addition to providing conveyance capacity, improvements to City of Newport streets should incorporate stormwater Best Management Practices (BMPs) to mitigate the negative effects to water quality and attenuate runoff volumes and peak flows where practical. The type and extent of these BMPs will depend on the extent of the improvements, potential pollutant loading and potential for significant downstream impacts due to increased peak flows and volumes. The physical constraints of topography or environmentally sensitive, historic or developed areas that make constructing or reconstructing a roadway a challenge also apply to finding suitable space for stormwater management BMPs. The following table outlines some of the potential BMP types and where they may be suitable.

Table 1: BMP Site Suitability Considerations

Factor = ● Non-Factor = x	**Physical Feature (see descriptions on the next page)**			
BMP Facility	Slope	Facility Area	In Situ Infiltration Rate	Groundwater Depth
Infiltration (Drywell with pretreatment)	x	x	●	●
Vegetated Swale	●	●	●	●
Vegetated Planter	●	●	●	●
Grass Filter Strip	●	●	●	x
Trees	x	●	x	x
Dry/Wet Detention Pond	●	●	●	●
Porous Pavement	●	x	●	●
Proprietary Filtration Facility	x	x	x	x
Proprietary Separation Facility	x	x	x	x
Sedimentation Manhole	x	x	x	x
Sumped Inlets	x	x	x	x

Adapted from the ODOT Hydraulics Manual

Description of Physical Features

- **Slope:** A minimal slope for vegetated facilities allows for treatment and infiltration of runoff. In comparison, facilities with small facility footprints will be less affected by the existing slope. Slope is a factor a BMP if it can have an impact on construction and proper function.
- **Facility Area:** The area a stormwater facility occupies limits whether or not it can be installed within a proposed project. Vegetated swales, planters, and filters strips require a larger area than a compact manhole or proprietary system. Likewise, trees cannot exceed a certain size in order to meet sight distance requirements. Facilities with larger areas or height considerations have facility area as a factor.
- **In Situ Infiltration Rate:** Soil infiltration rates allow for stormwater runoff to be captured within facility soils. If a facility uses infiltration to reduce runoff volumes it has in situ infiltration rates as a factor.
- **Groundwater Depth:** Groundwater depth describes how close to ground surface the water table is located. Soils at or below groundwater depth are fully saturated, and will not be able to accommodate additional runoff volumes. If a facility is affected by the depth of ground water for proper function it has the criteria included as a factor.

Prior to construction of any transportation improvements, a project specific stormwater investigation should be completed to determine the site specific constraints and appropriate BMPs. The ODOT Hydraulics Manual along with DEQ stormwater guidance should be consulted for specific design parameters.

A review of the downstream stormwater conveyance system should be completed as part of any modifications to ensure that the runoff is not contributing to issues with capacity or integrity of the stormwater outfall. The extent of the downstream analysis will depend on the extent of the improvements and specific site conditions.

Agate Beach Stormwater Considerations

As noted in the Geotechnical Consultation for Agate Beach memorandum prepared by Foundation Engineering, Inc. as part of the development of the City of Newport TSP, the Agate Beach neighborhood is experiencing a high amount of coastal erosion along with potential for settlement of undocumented fill in the low-lying areas. A site-specific analysis by a certified engineering geologist is required for development within areas of high risk of erosion, settlement or landslides. These constraints make the need for stormwater BMPs that attenuate peak flows and volumes even more critical to ensuring that erosion and settlement isn't exacerbated by newly constructed transportation infrastructure. With potential for erosion and the presence of undocumented fill, facility types that rely on infiltration (drywells, soakage trenches, infiltration planters/basins) may not be appropriate due to the varying infiltration capacity and potential to increase settlement or erosion. Flow-through facilities such as swales, vegetated filter strips or mechanical treatment are likely more appropriate, with structured/mechanical treatment being the most likely approach to achieve stormwater management goals while minimizing the potential for increased settlement or erosion.

APPENDIX N- TECHNICAL MEMORANDUM #12: DEVELOPMENT CODE AMENDMENTS

MEMORANDUM

DATE: December 8, 2021

TO: Newport TSP Project Management Team

FROM: Andrew Parish, Shayna Rehberg, and Darci Rudzinski, APG

SUBJECT: Newport Transportation System Plan Update
Development Code Amendments

Introduction

The City of Newport is undertaking an update of the City of Newport Transportation System Plan (TSP) consistent with the requirements of Statewide Planning Goal 12 - Transportation. This memorandum identifies needed amendments to the City's Municipal Code, Title 13 Land Division and Title 14 Zoning Code (collectively known as the "Development Code") to be consistent with the updated TSP. This material is an outgrowth of:

- TM #3 – Regulatory Review and Transportation Planning Rule (TPR)
- Code Concepts – Transportation Mitigation and Implementation
- Additional discussion with city staff and the consultant team

Table 1 identifies the proposed amendments and includes a reference number for the associated text that follows the table, with code additions and deletions shown in underline-strikeout text.

Table 1. Municipal Code Recommendations

Recommendation and Discussion	Reference
Identify "Transportation Facilities (operation, maintenance, preservation, and construction in accordance with the city's Transportation System Plan)" as a permitted use in all land use districts as required by the Transportation Planning Rule (TPR)	1
Consolidate the definitions of transportation facilities throughout the Development Code.	2
Adjust the Traffic Impact Assessment (TIA) threshold and process described in the Zoning Ordinance to reduce the number of peak hour trips for which a TIA is required.	3

Recommendation and Discussion	**Reference**
Add specific language requiring that transportation providers, including ODOT, Lincoln County Transit be notified of proposals that may impact their facilities or services. Additionally, add provisions for pre-application conferences in the procedures section of the code.	4
Update the Development Code to better address transit by requiring transit amenities as identified in the Lincoln County Transit Development Plan, update bicycle parking requirements to include transit facilities, and improve provision of bicycle parking through development.	5
Amend the Development Code to include language addressing vehicular access, circulation, connections, and pedestrian access through parking lots.	6
Amend the Development Code to include the TSP's updated street standards, block lengths, and accessway requirements	7
Provide new code language for drive aisles and parking lot layouts.	8
Amend the Development Code to clarify that development along state highways requires coordination with ODOT.	9
Address TPR requirements related to bicycle and pedestrian access and mobility through the addition of a new Pedestrian Access and Circulation section	10
Require new developments with planned designated employee parking areas provide preferential parking for employee carpools and vanpools.	11
Develop a new "Transportation Mitigation Procedure" section of the code.	12
Identify city authority and process for deploying traffic calming on neighborhood collectors.	13
Consolidate the transportation-related sections of Title 13 and Title 14 in one location.	14
Incorporate remaining provisions of Title 13 into Title 14.	15

Reference 1: Transportation Facilities as Allowed Use

Recommendation: Consolidate the definition of transportation facilities throughout the Development Code, and identify "Transportation Facilities (operation, maintenance, preservation, and construction in accordance with the city's Transportation System Plan)" as a permitted use in all land use districts as required by the TPR.

14.03.050 Residential Uses

		R-1	R-2	R-3	R-4
Z	Transportation Facilities	P	P	P	P

14.03.070 Commercial and Industrial Uses.

		C-1	C-2[1]	C-3	I-1	I-2	I-3
12	Basic Utilities ~~and Roads~~ [3]	P	P	P	P	P	P
22	Transportation Facilities	P	P	P	P	P	P

14.03.080 Water-dependent and Water-related Uses.

		W-1	W-2
22	Transportation Facilities	P	P

14.03.100 Public Uses

		P-1	P2	P-3
25.	~~Trails, paths, bike paths, walkways, etc.~~ Transportation Facilities	P	P	P

Reference 2: Consolidation of Definitions

Recommendation: Consolidate the definitions of transportation facilities throughout the Development Code.

Reference 3: Traffic Impact Analysis

Recommendation: Adjust threshold and process of the Traffic Impact Assessment (TIA) described in the Development Code to reduce the number of peak hour trips for which a TIA is required.

CHAPTER 14.45 TRAFFIC IMPACT ANALYSIS

14.45.010 Applicability

A Traffic Impact Analysis (TIA) shall be submitted to the city with a land use application under any one or more of the following circumstances:

A. To determine whether a significant effect on the transportation system would result from a proposed amendment to the Newport Comprehensive Plan or to a land use regulation, as specified in OAR 660-012-0060.
B. ODOT requires a TIA in conjunction with a requested approach road permit, as specified in OAR 734-051-3030(4).
C. The proposal may generate 500 or more average daily trips or ~~100~~ 50 PM peak-hour trips or more ~~onto city streets or county roads~~.
D. The proposal may increase use of any adjacent street by 10 vehicles or more per day that exceeds 26,000 pound gross vehicle weight.
E. The proposal includes a request to use Trip Reserve Fund trips to meet the requirements of Chapter 14.43, South Beach Transportation Overlay Zone.
F. Existing or proposed approaches or access connections that do not meet minimum spacing or sight distance requirements or are located where vehicles entering or leaving the property are restricted, or the location of an existing or proposed access driveway does not meet minimum access spacing or sight distance requirements;
G. Where a parcel adjacent to the site and under the same ownership as the subject parcel or parcels has received land use approval for development that resulted in an increase in traffic within the last three (3) years, the TIA shall include the adjacent development impacts for the purposes of meeting applicability thresholds.

…

14.45.020 Traffic Impact Analysis Requirements

…

H. Phased Development. If the land use application is part of a phased development, the TIA shall be analyze the ultimate build-out of all phases of the project.

14.45.050 Approval Criteria

When a TIA is required, a development proposal is subject to the following criteria, in addition to all criteria otherwise applicable to the underlying proposal:

A. The analysis complies with the requirements of 14.45.020;

B. The TIA demonstrates that adequate transportation facilities exist to serve the proposed development or identifies mitigation measures that resolve the traffic safety problems in a manner that is satisfactory to the City Engineer and, when state highway facilities are affected, to ODOT; and

C. Where a proposed amendment to the Newport Comprehensive Plan or land use regulation would significantly affect an existing or planned transportation facility, the TIA must demonstrate that solutions have been developed that are consistent with the provisions of OAR 660-012-0060; and

D. For affected non-highway facilities, the TIA establishes that any Level of Service standards adopted by the city in the Transportation System Plan (see Table 14.45.050-A) have been met. ~~and development will not cause excessive queuing or delays at affected intersections, as determined in the City Engineer's sole discretion; and~~

Table 14.45.050-A. Vehicle Mobility Standard for City Streets from the Newport Transportation System Plan

Intersection type	Proposed mobility standard	Reporting measure
Signalized	Los d and v/c ≤0.90	Intersection
All-way stop or roundabouts	Los d and v/c ≤0.90	Worst approach
Two-way stop[1]	Los e and v/c ≤0.95	Worst major approach/worst minor approach

1: Applies to approaches that serve more than 20 vehicles; there is no standard for approaches serving lower volumes.

E. Proposed public improvements are designed and will be constructed to the standards specified in Chapter 14.44 Transportation Standards. ~~or Chapter 13.05, Subdivision and Partition, as applicable.~~

14.45.060 Conditions of Approval

The city may deny, approve, or approve a development proposal with conditions needed to meet operations, structural, and safety standards and provide the necessary right-of-way and improvements to ensure consistency with the city's Transportation System Plan.

Note: Recommend removing Fee in Lieu option from the TIA section – it is referenced in the new Transportation Mitigation Procedure (Reference 12) and may otherwise be required even in cases where a TIA is not needed.

~~14.45.070 Fee in lieu Option~~

…

14.44.65 Fee in Lieu Option

The city may require the applicant to pay a fee in lieu of constructing required frontage improvements.

A. A fee in lieu may be required by the city under the following circumstances:

1. There is no existing road network in the area.

2. There is a planned roadway in the vicinity of the site, or an existing roadway stubbing into the site, that would provide better access and local street connectivity.

3. When required improvements are inconsistent with the phasing of transportation improvements in the vicinity and would be more efficiently or effectively built subsequent to or in conjunction with other needed improvements in area.

~~4. For any other reason which would result in rendering construction of otherwise required improvements impractical at the time of development.~~

B. The fee shall be calculated as a fixed amount per linear foot of needed transportation facility improvements. The rate shall be set at the current rate of construction per square foot or square yard of roadway built to adopted city or ODOT standards at the time of application. Such rate shall be determined by the city, based upon available and appropriate bid price information, including but not limited to surveys of local construction bid prices, and ODOT bid prices. This amount shall be established by resolution of the City Council upon the recommendation of the City Engineer and reviewed periodically. The amount of monies deposited with the city shall be at least 125 percent of the estimated cost of the required street improvements, inclusive of associated storm drainage improvements, or such other percentage to account for inflation, as established by City Council resolution. The fee shall be paid prior to final plat recording for land division applications or issuance of a building permit for land development applications.

C. All fees collected under the provisions of Section 14.45.070 shall be used for construction of like type roadway improvements within City of Newport's Urban Growth Boundary, consistent with the Transportation System Plan. Fees assessed to the proposed development shall be roughly proportional to the benefits the proposed development will obtain from improvements constructed with the paid fee.

Reference 4: Notice Requirements & Pre-Application Conference

Recommendation: Add specific language for applications requiring transportation providers, including ODOT, Lincoln County Transit be notified of proposals that may impact their facilities or services.

Add pre-application requirements.

CHAPTER 14.52 PROCEDURAL REQUIREMENTS
14.52.060 Notice

…

C. Mailing of Notice...

…

2. Any affected public agency, including ODOT and Lincoln County Transit, or public/private utility.

14.52.045 Pre-Application Conference

A. Purpose and Intent. The purpose of the conference shall be to acquaint the applicant with the substantive and procedural requirements of the Development Code and to identify issues likely to arise in processing an application. Pre-application conferences shall be conducted by the Community Development Director and/or his or her designee and shall include other city officials and public agency representatives as may be necessary for preliminary staff review of the proposal and to provide guidance to the applicant.

B. Applicability. A pre-application conference with the City of Newport is required for Type II, Type III, and Type IV applications unless waived by the Community Development Director.

C. Pre-application Materials. The applicant is requested to provide the following materials prior to the pre-application conference.

1. Location and conceptual site plan of the proposed development.

2. List of questions for staff

Reference 5: Transit-Supportive Requirements

Recommendation: Update the Development Code to better address transit by requiring provision of transit amenities as identified in the Lincoln County Transit Development Plan and amend bicycle parking requirements to include transit amenities and improve provision of bicycle parking through development.

CHAPTER 14.44 TRANSPORTATION STANDARDS

14.44.50 Transportation Standards

…

F. Transit improvements. Developments that are proposed on the same site as, or adjacent to, an existing or planned transit stop, as designated in the Lincoln County Transit District's 2018 Transit Development Plan, shall provide the following transit access and supportive improvements in coordination with the transit service provider:

(a) Reasonably direct pedestrian and bicycle connections between the transit stop and primary entrances of the buildings on site, consistent with the definition of "reasonably direct" in Section 13.05.005.

(b) The primary entrance of the building closest to the street where the transit stop is located shall be oriented to that street.

(c) A transit passenger landing pad.

(d) An easement or dedication for a passenger shelter or bench if such an improvement is identified in an adopted transportation or transit plan or if the transit stop is estimated by the Lincoln County Transit District to have at least 10 boardings per day.

(e) Lighting at the transit stop.

(f) Other improvements identified in an adopted transportation or transit plan, provided that the improvements are roughly proportional to the impact of the development on the City's transportation system and the County's transit system.

14.14.070 Bicycle Parking

Bicycle parking facilities shall be provided as part of new multi-family residential developments of ~~four~~ five units or more; ~~and~~ new retail, office, and institutional developments; and park-and-ride lots and transit transfer stations.

A. The required minimum number of bicycle parking spaces is as follows, rounding up to the nearest whole number:

Parking Spaces ~~Required~~	Bike Spaces Required
1 to 4 [a]	1 ~~0~~
5 to 25	1
26 to 50	2
51 to 100	3
Over 100	1/~~50~~ 25

[a] Residential developments less than 5 units are exempt from bicycle parking requirements

Reference 6: Vehicular Access and Circulation

Recommendation: Amend the Development Code to include language for vehicular access and circulation and connections, and pedestrian access through parking lots.

CHAPTER 14.14 PARKING AND LOADING~~, AND ACCESS~~ REQUIREMENTS

CHAPTER 14.61 VEHICULAR ACCESS AND CIRCULATION

A. Purpose and Intent. Section 14.61 implements the street access policies of the City of Newport Transportation System Plan. It is intended to promote safe vehicle access and egress to properties, while maintaining traffic operations in conformance with adopted standards. "Safety," for the purposes of this chapter, extends to all modes of transportation.

B. Permit Required. Vehicular access to a public street (e.g., a new or modified driveway connection to a street or highway) requires a right-of-way permit, pursuant to NMC Chapter 9.10. In addition, approval by Lincoln County is required for connections to county roads within the city limits, and authorization from the Oregon Department of Transportation is required for connections onto US 101 or US 20.

C. Approach and Driveway Development Standards. Approaches and driveways shall conform to all of the following applicable development standards:

1. Access to parking lots shall be from a public street or alley. Access to loading and unloading areas shall be from a public street, an alley, or a parking lot.
2. Access to nonresidential parking lots or loading and unloading areas shall not be through areas that are zoned residential.
3. All accesses shall be approved by the City Engineer or designate.
4. Access Consolidation. Accesses shall be consolidated unless demonstrated to be unfeasible as determined by the City Engineer.
5. Access shall be taken from lower classification streets (e.g. local and neighborhood collector streets) when it can be accomplished in conformance with these standards.
6. New approaches shall conform to the spacing standards of subsections Table 14.61-A, and shall conform to minimum sight distance and channelization standards of the city, county or ODOT, as appropriate.
7. Existing approaches shall be upgraded as specified in an approved Traffic Impact Analysis.
8. With the exception of Private Driveways as defined in Section 14.01.020, all approaches and driveways serving more than five parking spaces shall be paved and meet applicable construction standards.
9. The city may limit the number or location of connections to a street, or limit directional travel at an approach to one-way, right-turn only, or other restrictions, where the city, county, or ODOT requires mitigation to alleviate safety or traffic operations concerns.
10. Where city, county, or ODOT spacing standards limit the number or location of connections to a street or highway, the city may require a driveway extend to one or more edges of a parcel and be designed to allow for future extension and inter-parcel circulation as adjacent properties develop. The city may also require the owner(s) of the subject site to record an access easement for future joint use of the approach and driveway as the adjacent property(ies) develop(s).
11. Where applicable codes require emergency vehicle access, approaches and driveways shall be designed and constructed to accommodate emergency vehicle apparatus.
12. As applicable, approaches and driveways shall be designed and constructed to accommodate truck/trailer-turning movements.
13. Driveways shall accommodate all projected vehicular traffic on-site without vehicles stacking or backing up onto a street.

14. Driveways shall be designed so that vehicle areas, including, but not limited to, vehicle storage and service areas, do not obstruct any public right-of-way.
15. Drive-up/drive-in/drive-through uses and facilities shall meet the standards in Section 14.14.090(G).
16. Approaches and driveways shall be a minimum of twelve (12) feet for a one-way drive and twenty (20) feet for a two-way drives. Approaches and driveways shall not be greater than 150% of the minimum, with the exception of those that serve industrial uses and heavy commercial uses which may be up to 35 feet.
17. Construction of approaches along acceleration or deceleration lanes, and along tapered (reduced width) portions of a roadway, shall be avoided; except where no reasonable alternative exists and the approach does not create safety or traffic operations concern.
18. Approaches and driveways shall be located and designed to allow for safe maneuvering in and around loading areas, while avoiding conflicts with pedestrians, parking, landscaping, and buildings.
19. Where sidewalks or walkways occur adjacent to a roadway, driveway aprons constructed of concrete shall be installed between the driveway and roadway edge.
20. Where an accessible route is required pursuant to ADA, approaches and driveways shall meet accessibility requirements where they coincide with an accessible route.
21. The city may require changes to the proposed configuration and design of an approach, including the number of drive aisles or lanes, surfacing, traffic-calming features, allowable turning movements, and other changes or mitigation, to ensure traffic safety and operations.
22. Where a new approach onto a state highway or a change of use adjacent to a state highway requires ODOT approval, the applicant is responsible for obtaining ODOT approval. The city may approve a development conditionally, requiring the applicant first obtain required ODOT permit(s) before commencing development, in which case the city will work cooperatively with the applicant and ODOT to avoid unnecessary delays.
23. Where a proposed driveway crosses a culvert or drainage ditch, the city may require the developer to install a culvert extending under and beyond the edges of the driveway on both sides of it, pursuant to applicable engineering and stormwater design standards.

24. Temporary driveways providing access to a construction site, staging area, or special event shall be paved, graveled, or treated in an alternative manner as approved by the City Engineer, to prevent tracking of mud onto adjacent paved streets.

Table 14.61-A. Access Spacing Standards [1]

	Arterials [3]	**Major Collectors**	**Neighborhood Collectors**	**Local Streets**
Minimum Driveway Spacing (Driveway to Driveway)	See Table 14.61-B	100 feet	75 feet	n/a
Minimum Intersection Setback (Full Access Driveways Only)	See Table 14.61-B	150 feet	75 feet	25 feet
Minimum Intersection Setback (Right-In/Right-Out Driveways Only)	See Table 14.61-B	75 feet	50 feet	25 feet
Maximum Length Between Pedestrian/Bicycle Connections	See Table 14.61-B	300 Feet	300 Feet	300 Feet

1. All distances measured from the edge of adjacent approaches.

3. All Arterial streets in Newport are under ODOT jurisdiction. ODOT facilities are subject to access spacing guidelines in the Oregon Highway Plan, Appendix C Table 14, and the Blueprint for Urban Design. Blueprint for Urban Design Guidelines in Table 14.61-B are based on posted speed and urban context.

Table 14.61-B. Blueprint for Urban Design Guidelines for Arterial Access Spacing Standards.

Urban Context (Posted Speed)	**Target Spacing Range (Feet)**
Traditional Downtown/CBD (20-25 mph)	250-550
Urban Mix (25-30 mph)	250-550
Commercial Corridor (30-35 mph)	500-1,000
Residential Corridor (30-35 mph)	500-1000
Suburban Fringe (35-40 mph)	750-1,500
Rural Community (25-35)	250-750
Source: ODOT Blueprint for Urban Design, Tables 3-9 and 3-10	

D.. Exceptions and Adjustments. The city may approve deviations from the spacing standards in Table 14.61-A through a Type II procedure, where the criteria in 1. or 2. can be met.

1. An existing connection to a city street does not meet the standards of the roadway authority and the proposed development moves in the direction of code compliance.

2. Mitigation measures, such as consolidated access, joint use driveways, directional limitations (e.g., one-way), turning restrictions (e.g., right-in/right-out only), or other mitigation actions can be shown to mitigate all traffic operations and safety concerns.

E. Joint Use Access Easement and Maintenance Agreement. Where the city approves a joint use driveway, the property owners shall record an easement with the deed allowing joint use of and cross access between adjacent properties. The owners of the properties agreeing to joint use of the driveway shall record a joint maintenance agreement with the deed, defining maintenance responsibilities of property owners. The applicant shall provide a fully executed copy of the agreement to the city for its records.

~~**14.14.120 Access**~~

~~A. Access to parking lots shall be from a public street or alley. Access to loading and unloading areas shall be from a public street, an alley, or a parking lot.~~

~~B. Access to nonresidential parking lots or loading and unloading areas shall not be through areas that are zoned residential.~~

~~C. All accesses shall be approved by the City Engineer or designate.~~

~~D. Driveway accesses onto Arterial streets shall be spaced a distance of 500 feet where practical, as measured from the center of driveway to center of driveway~~

~~E. Each parcel or lot shall be limited to one driveway onto an Arterial street unless the spacing standard in (D) can be satisfied.~~

F. ~~Access Consolidation. Accesses shall be consolidated unless demonstrated to be unfeasible as determined by the City Engineer.~~

Reference 7: Street, Block Length, and Accessway Standards

Recommendation: Update street, block length, and accessway standards to match TSP recommendations.

Street standards are included as part of Recommendation 14, Consolidation of Transportation Standards. Block length standards addressed below and are recommended to remain as part of subdivision/partition requirements.

13.05.020 Blocks

~~A. General. The length, width, and shape of blocks for non-residential subdivisions shall take into account the need for adequate building site size and street width, and shall recognize the limitations of the topography.~~

A. ~~B. Size. No block shall be more than 1,000 feet in length between street corners.~~ Blocks created in land divisions shall be consistent with the standards in Table 14.44.065 -A. Modifications to ~~this requirement~~ the standards may be made by the approving authority pursuant to the standards in Chapter 14.33 if the street is adjacent to an arterial street, ~~or the topography or~~ the location of adjoining streets, or other constraints identified in **Section 14.33.100** justify ~~ies~~ the modification. ~~A pedestrian or bicycle way may be required by easement or dedication by the approving authority to allow connectivity to a nearby or abutting street, park, school, or trail system to allow for efficient pedestrian and bicycle connectivity between areas if a block of greater than 1,000 feet if a modification is approved and the requested easement or dedication has a rational nexus to the proposed development and is roughly proportional to the impacts created by the proposed land division.~~

B. Mid-block pedestrian and bicycle connections must be provided when the block length exceeds 300 feet to ensure convenient access for all users. Mid-block pedestrian and bicycle connections must be provided on a public easement or right-of-way every 300 feet, unless the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use, or other factors that may prevent safe crossing; or a rational nexus to the proposed development is not established and the connection is not roughly proportional to the impacts created by the proposed land division.

Table 13.05.020 -A. Block Length [1]

	Arterials [3]	**Major Collectors**	**Neighborhood Collectors**	**Local Streets**
Maximum Block Length	550 Feet	1000 feet	1000 feet	1000 feet

(Public Street to Public Street)				
Minimum Block Length (Public Street to Public Street)	220-550 Feet	200 feet	150 feet	125 feet
Maximum Length Between Pedestrian/Bicycle Connections (Public Street to Public Street, Public Street to Connection, or Connection to Connection) [2]	220-550 Feet	300 feet	300 feet	300 feet

1. All distances measured from the edge of adjacent approaches.

2. See 13.05.020(B).

3. All Arterial streets in Newport are under ODOT jurisdiction. ODOT facilities are subject to access spacing guidelines in the Oregon Highway and the Blueprint for Urban Design which vary based on posted speed and urban context.

Reference 8: Parking Lot Standards

Recommendation: Provide new code language for drive aisles and parking lot layouts.

14.14.060 Compact Spaces

For parking lots of ~~four~~ five vehicles or more, 40% of the spaces may be compact spaces~~, as defined in Section 14.14.090(A)~~ measuring 7.5 feet wide by 15 feet long. Each compact space must be marked with the word "Compact" in letters that are at least six inches high.

14.14.090 Parking Lot Standards

Parking lots shall comply with the following:

A. Parking Lot Minimum Standards. Parking lots shall be designed pursuant to the minimum dimensions provided in Table 14.14.090-A and Figure 14.14.090-A.~~Size of Spaces. Standard parking spaces shall be nine (9) feet in width by 18 feet in length. Compact spaces may be 7.5 feet wide by 15 feet long. Wherever parking areas consist of spaces set aside for parallel parking, the dimensions of such parking space(s) shall be not less than eight (8) feet wide and 22 feet long. Lines demarcating parking spaces may be drawn at various angles in relation to curbs or aisles so long as the parking spaces so created contain within them the rectangular area required by this section.~~

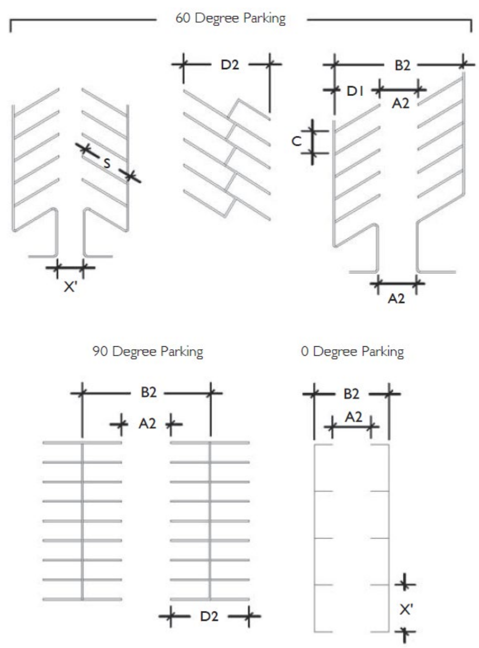
~~B. Aisle Widths. Parking area aisle widths shall conform to the following table, which varies the width requirement according to the angle of parking:~~

Parking Angle	0	30°	45°	60°	90°
Aisle Width					
One way traffic	13	11	13	18	24
Two-way traffic	19	20	21	23	24

Table 14.14.090-A - Parking Lot Minimum Dimensions

	PARKING ANGLE < °	CURB LENGTH	STALL DEPTH		AISLE WIDTH		BAY WIDTH		STRIPE LENGTH
			SINGLE D1	DOUBLE D2	ONE WAY A1	TWO WAY A2	ONE WAY B1	TWO WAY B2	
Standard Space	90°	8'-6"	18'	36'	23'	23'	59'	59'	18'
	60°	10'	20'	40'	17'	18'	57'	58'	23'
	45°	12'	18'-6"	37'	13'	18'	50'	55'	26'-6"
	30°	17'	16'-6"	33'	12'	18'	45'	51'	32'-8"
	0°	22'	8'-6"	17'	12'	18'	29'	35'	8'-6"

Figure 14.14.090-A - Parking Lot Minimum Dimensions



C. Surfacing. […]

D. Joint Use of Required Parking Spaces. […]

E. Satellite Parking. […]

F. Lighting. […]

G. Drive-Up/Drive-In/Drive-Through Uses and Facilities. […]

H. Driveway Standards. Driveways shall conform to the requirements of Section 14.61.D.

I. Landscaping and Screening. Parking lot landscaping and screening standards must comply with Section 14.19.050.

14.19.050 Landscaping Required for New Development, Exceptions

All new development, except for one and two family residences, shall be required to install landscaping per this section. For purposes of this section, new development shall mean construction upon a vacant lot or a lot that becomes vacant by virtue of the demolition of an existing building. Landscaping shall be provided as follows:

[…]

D. Landscaping and Screening for Parking Lots. The purpose of this subsection is to break up large expanses of parking lots with landscaping. Therefore, all parking areas or each parking bay where a development contains multiple parking areas ~~not abutting a landscaping area with 20 or more parking stalls~~ shall comply with the following provisions:

1. ~~Five percent of the parking area shall be dedicated to a landscaped area and areas.~~ A minimum of 10 percent of the total surface area of all parking areas, as measured around the perimeter of all parking spaces and maneuvering areas, shall be landscaped. This 10 percent landscaping requirement includes landscaping around the perimeter of parking areas as well as landscaped islands within parking areas. Such landscaping shall consist of canopy trees distributed throughout the parking area. A combination of deciduous and evergreen trees, shrubs, and ground cover plants is required. At a minimum, one tree per 12 parking spaces on average shall be planted over and around the parking area.

2. ~~In no cases shall a landscaped area required under this subsection be larger than 300 square feet. If more landscaping is required than the 300 square feet it shall be provided in separate landscaping areas.~~ All parking areas with more than 20 spaces shall provide landscape islands with trees that break up the parking area into rows of not more than 12 contiguous parking spaces. Landscape islands and planters shall have dimensions of not less than 48 square feet of area and no dimension of less than 6 feet, to ensure adequate soil, water, and space for healthy plant growth;

3. All required parking lot landscape areas not otherwise planted with trees must contain a combination of shrubs and groundcover plants so that, within 2 years of planting, not less than 50 percent of that area is covered with living plants; and

4. Wheel stops, curbs, bollards or other physical barriers are required along the edges of all vehicle-maneuvering areas to protect landscaping from being damaged by vehicles. Trees shall be planted not less than 2 feet from any such barrier.

5. Trees planted in tree wells within sidewalks or other paved areas shall be installed with root barriers, consistent with applicable nursery standards.

6. The edges of parking lots shall be screened to minimize vehicle headlights shining into adjacent rights-of-way and residential yards. Parking lots abutting sidewalk or walkway shall be screened using a low-growing hedge or low garden wall to a height of between 3 feet and 4 feet.

7. The provisions of this subsection do not apply to areas for the storage and/or display of vehicles.

Reference 9: Coordination with ODOT

Recommendation: Amend the Development Code to clarify that development along state highways requires coordination with ODOT.

This recommendation is addressed through amendments elsewhere in this memorandum:

- Reference 2: Access Management (standards table footnote)
- Reference 3: Transportation Impact Analysis
- Reference 4: Notice Requirements & Pre-Application Conference
- Reference 6: On-Site Circulation and Connections
- Reference 12: Transportation Mitigation Procedure (Process table)

Reference 10: Pedestrian Access and Circulation

Recommendation: Add new code section addressing pedestrian access and circulation.

CHAPTER 14.65 PEDESTRIAN ACCESS AND CIRCULATION

A. **Purpose and Intent.** This Chapter implements the pedestrian access and connectivity policies of City of Newport Transportation System Plan. It is intended to provide for safe, reasonably direct, and convenient pedestrian access and circulation.

B. **Applicability.** The provisions of this chapter shall apply to all new or substantial improvements to commercial, industrial, public/institutional, and multifamily development as defined in 14.1.020. Where the provisions of this chapter conflict with facilities identified in the Newport Parks and Recreation Master Plan, the Newport Parks and Recreation Master Plan shall govern.

C. Standards. Developments shall conform to all of the following standards for pedestrian access and circulation:

1. **Continuous Walkway System.** A pedestrian walkway system shall extend throughout the development site and connect to adjacent sidewalks, if any.

2. **Safe, Direct, and Convenient.** Walkways within developments shall provide safe, reasonably direct, and convenient connections between primary building entrances and all adjacent parking areas, recreational areas/playgrounds, and public rights-of-way based on all of the following criteria:

   a. The walkway is reasonably direct. A walkway is reasonably direct when it follows a route that does not deviate unnecessarily from a straight line or it does not involve a significant amount of out-of-direction travel;

   b. The walkway is designed primarily for pedestrian safety and convenience, meaning it is reasonably free from hazards and provides a reasonably smooth and consistent surface and direct route of travel between destinations. The city may require landscape buffering between walkways and adjacent parking lots or driveways to mitigate safety concerns.

   c. The walkway network connects to all primary building entrances in a manner consistent with the Oregon Structural Specialty Code.

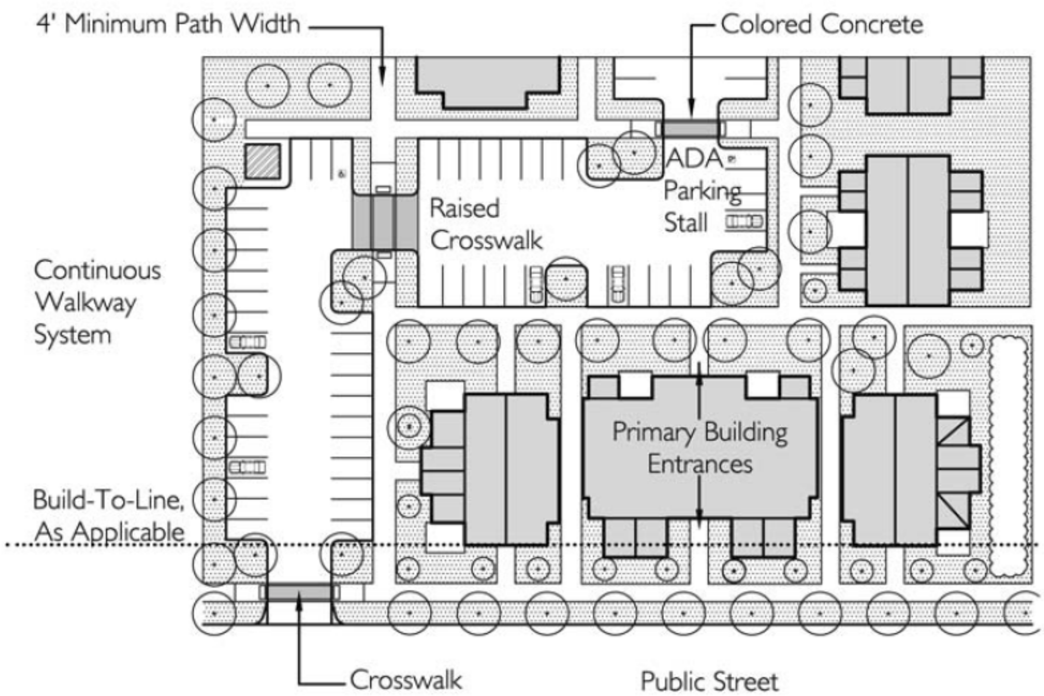
3. **Crosswalks**. Where a walkway crosses a parking area or driveway ("crosswalk"), it shall be clearly identified with pavement markings or contrasting paving materials (e.g., pavers, light-color concrete inlay between asphalt, or similar contrast). The crosswalk may be part of a speed table to improve driver-visibility of pedestrians.

4. **Walkway Surface.** Walkway surfaces may be concrete, asphalt, brick/masonry pavers, or other city-approved durable surface meeting Americans With Disabilities Act requirements.

5. **Walkway Width.** Walkways shall be not less than 4 feet in width, except that concrete walkways a minimum of 6 feet in width are required in commercial developments and where access ways are required.

6. **Pedestrian Trail, Accessway, and Shared Use Path.** Standards for trails, accessways, and shared use paths are found in Section 14.44.60.

Figure 14.65-A. - Pedestrian Access and Circulation Standards Illustration



Reference 11: Preferential Carpool/Vanpool Parking

Recommendation: Require new developments with planned designated employee parking areas provide preferential parking for employee carpools and vanpools.

14.14.090 Parking Lot Standards

[…]

K. Preferential Carpool/Vanpool Parking. Parking areas that have designated employee parking and more than 20 vehicle parking spaces shall provide at least 10% of the employee parking spaces, as preferential carpool and vanpool parking spaces. Preferential carpool and vanpool parking spaces shall be closer to the employee entrance of the building than other parking spaces, with the exception of ADA accessible parking spaces.

Reference 12: Transportation Mitigation Procedure

Recommendation: Add new procedure for approving alternative cross-sections and future guarantees in areas with topographical or other constraints.

Section 14.33.100 Transportation Mitigation Procedure

A. Purpose. The purpose of this procedure is to allow modifications to transportation standards where meeting the roadway cross-section requirements of Section 14.44.060 is not possible due to existing site constraints.

B. When Standards Apply. The standards of this section apply to new development or redevelopment for which a building permit is required and that place demands on public or private transportation facilities or city utilities. This procedure may be used in cases where full street improvements, half street improvements, and frontage improvements are required.

B. Approval Process.

1. Pre-application Conference. The applicant shall participate in a pre-application conference pursuant to Section 14.52.045 prior to submitting an application requesting a Transportation Mitigation Procedure. The Community Development Director, City Engineer, and other appropriate city officials will participate in the pre-application conference. The meeting will be coordinated with ODOT when an approach road to US-101 or US-20 serves the property so that the application addresses both city and ODOT requirements.

2. When a requested, the applicable review process will be the same as that accorded to the underlying land use proposal. If not requested as part of a land use proposal, this procedure shall be subject to a Type 1 process as defined in Section 14.52.020 (A).

C. Approval Criteria.

1. A cross-section other than that identified in the adopted TSP for the functional classification of the roadway may be approved if one or more of the following conditions apply to the subject property and result in site conditions that prohibit the preferred roadway cross-section from being constructed.

a. Slopes over 25%

b. Mapped landslide areas

c. Mapped wetlands (National Wetland Inventory, City Wetlands Areas, or site-specific survey)

d. Existing structures

e. Historical resources

f. Insufficient right-of-way

2. The steps to determine an acceptable alternate roadway design must be documented and follow the Process for Determining Street Cross-Sections in Constrained Conditions, as detailed in Table 14.33.100-A and the Newport Transportation System Plan.

3. The proposal shall identify which conditions in Subsection 1 above apply to the subject property and show how conditions prevent the preferred cross-section from being constructed.

4. The proposal shall include documentation in the form of a written agreement from the Community Development Director, or designee, in consultation with the City Engineer and other city officials, as appropriate, that the proposed cross-section is consistent with the Process for Determining Street Cross-Sections in Constrained Conditions as shown in the adopted Transportation System Plan.

Table 14.33.100-A. Process for Determining Street Cross-Sections in Constrained Conditions

ANY NON-ARTERIAL[1] STREET FUNCTIONAL CLASSIFICATION WITH:	STEPS TO REDUCE LOWER PRIORITY STREET COMPONENTS[5]			
	STEP 1	STEP 2	STEP 3	STEP 4
EQUAL PEDESTRIAN AND BICYCLE CORRIDORS[2]	Eliminate on-street parking on one or both sides	Reduce sidewalk frontage zone to acceptable width	Choose acceptable bike facility	Reduce the furnishings/ landscape zone or pedestrian throughway to acceptable width
HIGHER PEDESTRIAN VS. BICYCLE CORRIDORS [3]		Implement acceptable bike facility	Reduce sidewalk frontage zone to acceptable width	
HIGHER BICYCLE VS. PEDESTRIAN CORRIDORS[4]		Reduce sidewalk frontage zone to acceptable width	Reduce the furnishings/ landscape zone or pedestrian throughway to acceptable width	Implement acceptable bike facility

Notes:

1. The street cross-section for ODOT facilities depends on the urban context and are subject to review and approval by ODOT. Additional detail is provided in the BUD.
2. Includes Major Pedestrian vs. Major Bicycle corridor, Neighborhood Pedestrian vs. Neighborhood Bicycle corridor, or Local Pedestrian vs. Local Bicycle corridor.
3. Includes Major Pedestrian vs. Neighborhood or Local Bicycle corridor, or Neighborhood Pedestrian vs. Local Bicycle corridor.
4. Includes Major Bicycle vs. Neighborhood or Local Pedestrian corridor, or Neighborhood Bicycle vs. Local Pedestrian corridor
5. Local Streets that carry less than 500 vehicles per day are candidates for shared street treatments in lieu of this process

14.47.40 Conditions of Approval

The city may deny, approve, or approve a development proposal with conditions needed to meet operations, structural, and safety standards and provide the necessary right-of-way and improvements to ensure consistency with the city's Transportation System Plan. Improvements required as a condition of development approval, when not voluntarily accepted by the applicant, shall be roughly proportional to the impact of the development on public facilities. Findings in the development approval shall indicate how the required improvements are directly related and roughly proportional to the impact.

14.47.50 Fee in Lieu. The city may require the applicant to pay a fee in lieu of constructing required frontage improvements, consistent with Section 14.44.60 - Fee in Lieu Option

Reference 13: Traffic Calming

Recommendation: Identify city authority and process for deploying traffic calming on neighborhood collectors.

This recommendation is addressed in Section 14.44.050 Transportation Standards under **Reference 14**

Reference 14: Consolidating Transportation Standards

Recommendation: Currently, standards relating to transportation facilities lie within Title 13 (Subdivisions and Partitions) and Title 14 (Zoning). The recommendation is to move standards to the existing Section 14.44: Transportation Standards. Definitions have been addressed as part of Reference 2.

13.05.005 Definitions

The definitions within Section 14.01.020 apply in this chapter.

Note: Other text is struck.

14.01.020 Definitions

Note: All definitions from 13.05.005 are moved to this chapter. Underline/strikeout language shows new text and changes to existing language.

…

Alley. A narrow street ~~25 feet or less~~ through a block primarily for vehicular service access to the back or side of properties otherwise abutting on another street. ~~Frontage on said alley shall not be construed as satisfying the requirements of this Ordinance related to frontage on a dedicated street.~~

…

Accessway. A walkway providing a through connection for pedestrians between two streets, between two lots, or between a development and a public right-of-way. It may be an accessway for pedestrians and bicyclists (with no vehicle access), or a walkway on public or private property (i.e., with a public access easement); it may also be designed to accommodate emergency vehicles.

Pedestrian Trail. Pedestrian trails are typically located in parks or natural areas and provide opportunities for both pedestrian circulation and recreation.

Shared Use Path. Shared use paths provide off-roadway facilities for walking and biking travel. Depending on their location, they can serve both recreational and citywide circulation needs. Shared use path designs vary in surface types and widths.

Roadway. The portion of a street right-of-way developed for vehicular traffic.

Street. A public or private way ~~other than a driveway~~ that is created to provide ingress or egress for ~~persons~~ vehicles to one or more lots, parcels, areas, or tracts of land. The City of Newport Transportation System Plan establishes four functional classifications of streets: Arterial, Major Collector, Neighborhood Collector, and Local Streets.

> ~~For the purposes of this section Title, a "driveway" is a private way that begins at a public right-of-way that is proposed to serve not more than four individual lots/parcels cumulative as the primary vehicular access to those individual lots/parcels.~~

1. ~~**Alley**. A narrow street through a block primarily for vehicular service access to the back or side of properties otherwise abutting on another street~~.

2. **Arterial**. ~~A street of considerable continuity which is primarily a traffic artery among large areas.~~ Arterial streets are primarily intended to serve regional and citywide traffic movement. Arterials provide the primary connection to collector streets~~. Where an Arterial intersects with a Neighborhood Collector or Local Street, access management and/or turn restrictions may be employed to reduce traffic delay.~~ The Arterial streets in Newport are US 101 and US 20.

3. **Half-street**. Partial improvement of an existing street, or a ~~A~~ portion of the width of a right of way, usually along the edge of a subdivision or partition, where the remaining portion of the street could be provided in another subdivision or partition, and consisting of at least a sidewalk and curb on one side and at least two travel lanes.

4. ~~**Marginal Access Street**. A minor street parallel and adjacent to a major arterial street providing access to abutting properties, but protected from through traffic.~~

5. ~~**Minor Street**. A street intended primarily for access to abutting properties.~~

6. **Major Collector Street.** Major Collectors are intended to distribute traffic from Arterials to streets of the same or lower classification.

7. **Neighborhood Collector Street.** Neighborhood Collectors distribute traffic from Arterial or Major Collector streets to Local Streets. They are distinguishable from Major Collectors in that they principally serve residential areas. Neighborhood Collector streets typically maintain slow vehicle operating speeds to accommodate safe use by all modes.

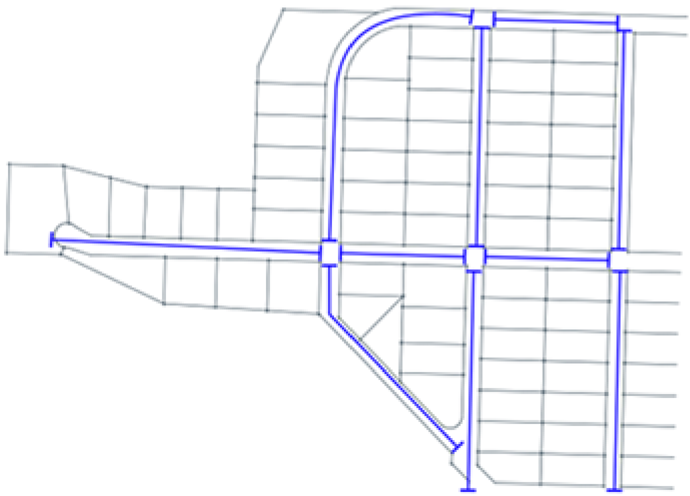
8. **Local Street**. All streets not classified as Arterial, Major Collector, or Neighborhood Collector streets are classified as Local Streets (seen at right). Local Streets provide local access and circulation for traffic, connect neighborhoods, and often function as through routes for pedestrians and bicyclists. Local Streets typically maintain slow vehicle operating speeds to accommodate safe use by all modes.

9. **Private Street.** Private Streets are a special type of Local Streets that are used to facilitate access to specific properties or neighborhoods. The City of Newport is not responsible for maintenance on private streets.

10. **Private Driveway.** A private street that begins at a public right-of-way that is proposed to serve not more than four individual lots/parcels cumulative as the primary vehicular access to those individual lots/parcels.

11. **Street Segment.** A portion of a local or collector street which is located between two intersections, or between an intersection and the end of a cul-de-sac or dead-end. See Illustration: Illustrative Street Segments, below.

Illustration Illustrative Street Segments
Street segments are indicated in with blue lines on the illustrative parcel map shown below.



12. **Shared Street.** A shared street is a local street that carries fewer than 500 vehicles per day. Shared streets have a single travel lane where all modes of travel share the paved roadway.

…

Transportation Facility. A street, pedestrian pathway, bicycle facility, shared use path, or other improvement for the conveyance of people or goods, as identified in the adopted Transportation System Plan.

Walkway. A pedestrian way, including but not limited to a sidewalk, path or accessway, providing access within public right-of-way or on private property.

…

Reasonably Direct. A route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.

13.05.015 Streets

A. Streets created as a subdivision or partition shall meet the requirements of 14.44.60

Note: All other text in this section is struck and incorporated into Section 14.44.60, below

13.05.040 Public Improvement Requirements

1. Streets. All streets, including alleys, within the land division, streets adjacent but only partially within the land divisions, and the extension of land division streets to the intersecting paving line of existing streets with which the land division streets intersect, shall be graded for the full right-of-way width. The roadway shall be improved to a width of 36 feet or other width as approved by the approval authority by excavating to the street grade, construction of concrete curbs and drainage structures, placing a minimum of six inches of compacted gravel base, placement of asphaltic pavement 36 feet in width or other width as approved by the approval authority and approximately two inches in depth, and doing such other improvements as may be necessary to make an appropriate and completed improvement. Street width standards ~~may be adjusted as part of the tentative plan approval to protect natural features and to take into account topographic constraints and geologic risks.~~ may be adjusted subject to the provisions of Section 14.33.100.

14.44.050 Transportation Standards

A. Development Standards. The following standards shall be met for all new uses and developments:

1. All new lots created, consolidated, or modified through a land division, partition, lot line adjustment, lot consolidation, or street vacation must have frontage or approved access to a public street.

2. Streets within or adjacent to a development subject to Chapter 13.05, Subdivision and Partition, shall be improved in accordance with the Transportation System Plan, the provisions of this Chapter, and the ~~street~~ standards in ~~Section 13.05.015~~ Section 14.44.060.

3. Development of new streets, and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance ~~Chapter 13.05,~~ Chapter 14.44 and public streets shall be dedicated to the applicable road authority;

4. Substandard streets adjacent to existing lots and parcels shall be brought into conformance with the standards of ~~Chapter 13.05~~. this chapter.

5. <u>Neighborhood Traffic Management such as speed tables, curb bulb-outs, traffic circles, and other solutions may be identified as required on-site or off-site improvements where the required mitigation is roughly proportional to the impacts of the proposed development.</u>

B. Guarantee. The city may accept a future improvement guarantee in the form of a surety bond, letter of credit or non-remonstrance agreement, in lieu of street improvements, if it determines that one or more of the following conditions exist:

1. A partial improvement may create a potential safety hazard to motorists or pedestrians;

2. Due to the developed condition of adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with the project under review does not, by itself, provide increased street safety or capacity, or improved pedestrian circulation;

3. The improvement would be in conflict with an adopted capital improvement plan; or

4. The improvement is associated with an approved land partition or minor replat and the proposed land partition does not create any new streets.

C. Creation of Rights-of-Way for Streets and Related Purposes. Streets may be created through the approval and recording of a final subdivision or partition plat pursuant to Chapter 13.05; by acceptance of a deed, provided that the street is deemed in the public interest by the City Council for the purpose of implementing the Transportation System Plan and the deeded right-of-way conforms to the standards of this Code; or other means as provided by state law.

D. Creation of Access Easements. The city may approve an access easement when the easement is necessary to provide viable access to a developable lot or parcel and there is not sufficient room for public right-of-way due to topography, lot configuration, or placement of existing buildings. Access easements shall be created and maintained in accordance with the Uniform Fire Code.

E. Street Location, Width, and Grade. The location, width and grade of all streets shall conform to the Transportation System Plan, subdivision plat, or street plan, as applicable and are to be constructed in a manner consistent with adopted City of Newport Engineering Design Criteria, Standard Specifications and Details. Street location, width, and grade shall be determined in relation to existing and planned streets, topographic conditions, public convenience and safety, and in appropriate relation to the proposed use of the land to be served by such streets, pursuant to the requirements in Chapter 13.05 and Chapter 14.44.

F. Transit improvements. Developments that are proposed on the same site as, or adjacent to, an existing or planned transit stop, as designated in the Lincoln County Transit District's 2018 Transit Development Plan, shall provide the following transit access and supportive improvements in coordination with the transit service provider:

(a) Reasonably direct pedestrian and bicycle connections between the transit stop and primary entrances of the buildings on site, consistent with the definition of "reasonably direct" in Section 13.05.005.

(b) The primary entrance of the building closest to the street where the transit stop is located shall be oriented to that street.

(c) A transit passenger landing pad.

(d) An easement or dedication for a passenger shelter or bench if such an improvement is identified in an adopted transportation or transit plan or if the transit stop is estimated by the Lincoln County Transit District to have at least 10 boardings per day.

(e) Lighting at the transit stop.

(f) Other improvements identified in an adopted transportation or transit plan, provided that the improvements are roughly proportional to the impact of the development on the City's transportation system and the County's transit system.

14.44.60 Streets, Pathways, Accessways, and Trails

Note: Text for this new section comes primarily from Section 13.05.015. Underline/strikeout formatting shows changes to existing adopted language.

~~A. Criteria for Consideration of Modifications to Street Design. As identified throughout the street standard requirements, modifications may be allowed to the~~

~~standards by the approving authority. In allowing for modifications, the approving authority shall consider modifications of location, width, and grade of streets in relation to existing and planned streets, to topographical or other geological/environmental conditions, to public convenience and safety, and to the proposed use of land to be served by the streets. The street system as modified shall assure an adequate traffic circulation system with intersection angles, grades, tangents, and curves appropriate for the traffic to be carried considering the terrain. Where location is not shown in the Transportation System Plan, the arrangement of streets shall either:~~

1. ~~Provide for the continuation or appropriate projection of existing principal streets in surrounding areas; or~~
2. ~~Conform to a plan for the neighborhood approved or adopted by the Planning Commission to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical.~~

B. ~~Minimum Right-of-Way and Roadway Width. Unless otherwise indicated in the Transportation System Plan, the street right-of-way and roadway widths shall not be less than the minimum width in feet shown in the following table:~~

~~Type of Street~~	~~Minimum Right-of-Way Width~~	~~Minimum Roadway Width~~
~~Arterial, Commercial, and Industrial~~	~~80 feet~~	~~44 feet~~
~~Collector~~	~~60 feet~~	~~44 feet~~
~~Minor Street~~	~~50 feet~~	~~36 feet~~
~~Radius for turn-around at end of cul-de-sac~~	~~50 feet~~	~~45 feet~~
~~Alleys~~	~~25 feet~~	~~20 feet~~

~~Modifications to this requirement may be made by the approving authority where conditions, particularly topography, geology, and/or environmental constraints, or the size and shape of the area of the subdivision or partition, make it impractical to otherwise provide buildable sites, narrower right-of-way and roadway width may be accepted. If necessary, slope easements may be required.~~

A. **Street Width and Cross Sections.** Right-of-way widths for streets shall comply with the Preferred Street Cross-Sections in the Transportation System Plan and the standards in Table 14.44.60-A.

Table 14.44.60-A. Minimum Right of Way and Roadway Widths

Functional Classification	Minimum Right of Way Width	Minimum Roadway Width
Major Collector	93 feet	63 feet
Neighborhood Collector	69 feet	48 feet
Local Street (Parking One Side Only)	47 feet	28 feet
Local Street (No Parking)	39 feet	20 feet

B. If the required cross-section is wider than the available right-of-way, coordination with the City of Newport is required to determine whether right-of-way dedication is necessary or design elements can be narrowed or removed. Any modifications to the preferred street cross-section require approval pursuant to the requirements of Section 14.33.100 – Transportation Mitigation Procedure. Constrained conditions on ODOT facilities will require review and approval by ODOT.

C. Reserve Strips. Reserve strips giving a private property owner control of access to streets are not allowed.

D. Alignment. Streets other than minor streets shall be in alignment with existing streets by continuations of their center lines. Staggered street alignment resulting in "T" intersections shall leave a minimum distance of 200 feet between the center lines of streets having approximately the same direction and, in no case, shall be less than 100 feet. If not practical to do so because of topography or other conditions, this requirement may be modified by the approving authority.

E. Future Extensions of Streets. Proposed streets within a land division shall be extended to the boundary of the land division. A turnaround if required by the Uniform Fire Code will be required to be provided. If the approval authority determines that it is not necessary to extend the streets to allow the future division of adjoining land in accordance with this chapter, then this requirement may be modified such that a proposed street does not have to be extended to the boundary of the land division.

F. Intersection Angles.

1. Streets shall be laid out to intersect at right angles.

2. An arterial intersecting with another street shall have at least 100 feet of tangent adjacent to the intersection.

3. Other streets, except alleys, shall have at least 50 feet of tangent adjacent to the intersection.

4. Intersections which contain an acute angle of less than 80 degrees or which include an arterial street shall have a minimum corner radius sufficient to allow for a roadway radius of 20 feet and maintain a uniform width between the roadway and the right-of-way line.

5. No more than two streets may intersect at any one point.

6. If it is impractical due to topography or other conditions that require a lesser angle, the requirements of this section may be modified by the approval authority. In no case shall the acute angle in Subsection F.(1.) be less than 80 degrees unless there is a special intersection design.

G. Half Street. Half streets are not allowed. Modifications to this requirement may be made by the approving authority to allow half streets only where essential to the reasonable development of the land division, when in conformity with the other requirements of these regulations and when the city finds it will be practical to require the dedication of the other half when the adjoining property is divided. Whenever a half street is adjacent to a tract property to be divided, the other half of the street shall be provided.

H. Sidewalks. Sidewalks in conformance with the city's adopted sidewalk design standards are required on both sides of all streets within the proposed land division and are required along any street that abuts the land division that does not have sidewalk abutting the property within the land division. The city may exempt or modify the requirement for sidewalks only upon the issuance of a variance as defined in the Zoning Ordinance.

I. Cul-de-sac. A cul-de-sac shall have a maximum length of 400 feet and serve building sites for not more than 18 dwelling units. A cul-de-sac shall terminate with a circular turn-around meeting minimum Uniform Fire Code requirements. Modifications to this requirement may be made by the approving authority. A pedestrian or bicycle way may be required by easement or dedication by the approving authority to connect from a cul-de-sac to a nearby or abutting street, park, school, or trail system to allow for efficient pedestrian and bicycle connectivity between areas if a modification is approved and the requested easement or dedication has a rational nexus to the proposed development and is roughly proportional to the impacts created by the proposed land division.

J. Street Names. Except for extensions of existing streets, no street name shall be used which will duplicate or be confused with the name of an existing street. Street names and numbers shall conform to the established pattern in the city, as evident in the physical landscape and described in City of Newport Ordinance No. 665, as amended.

K. Marginal Access Streets. Where a land division abuts or contains an existing or proposed arterial street, the Planning Commission may require marginal access streets, reverse frontage lots with suitable depth, screen planting contained in a non-access reservation along the rear or side property line, or other treatment necessary for adequate protection of residential properties and to afford separation of through and local traffic.

L. Alleys. Alleys shall be provided in commercial and industrial districts. If other permanent provisions for access to off-street parking and loading facilities are provided, the approving authority is authorized to modify this provision if a determination is made that the other permanent provisions for access to off-street parking and loading facilities are adequate to assure such access. The corners of alley intersections shall have a radius of not less than 12 feet.

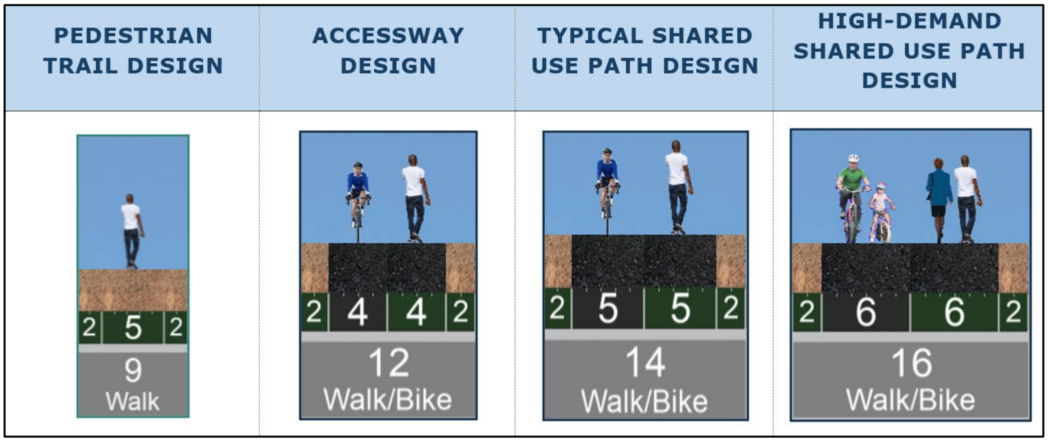
M. Street Trees. Trees and other plantings may be installed within proposed or existing rights-of-ways provided they conform to the City's approved Tree Manual.

N. **Accessways**. Accessways must be on public easements or rights-of-way and have a minimum paved surface of 8 feet, with a 2-foot shoulder on each side, within a 12-foot right-of-way.

O. **Shared Use Paths**. A shared use path must be a minimum of 10 feet wide within 14 feet of right-of-way. In areas with significant walking or biking demand, as identified in the Newport Transportation System Plan (e.g., Nye Beach Area, Oregon Coast Bike Route) or on ODOT facilities, the path must be 12 feet wide within a right-of-way of 16 feet (see Figure 14.44.060-A). A shared use path may be narrowed to 8 feet over short distances to address environmental or right-of-way constraints.

1. High-demand shared use path is required parallel to ODOT facilities and in other areas with significant walking or biking demand as identified in the Transportation System Plan.

Figure 14.44.060-A. Pedestrian Trail, Accessway, and Shared Use Path Guidelines Illustration



P. **Pedestrian Trail.** Pedestrian trails are typically located in parks or natural areas and provide opportunities for both pedestrian circulation and recreation. They may be constructed as a hard or soft surface facility. The City of Newport Parks System Master Plan identifies requirements for specific trail improvements.

Q. **Accessway**. Accessways must be on public easements or rights-of-way and have minimum paved surface of 8 feet, with a 2-foot shoulder on each side, and 12 feet of right-of-way.

Recommendation 15: Incorporate remaining provisions of Title 13 into Title 14

The table below provides suggested locations and considerations for moving the subdivision/property line adjustment provisions of Title 13 into Title 14. Some recommendation have been address in the proposed text amendments; for others detailed underline-strikeout language is not provided as part of this memorandum.

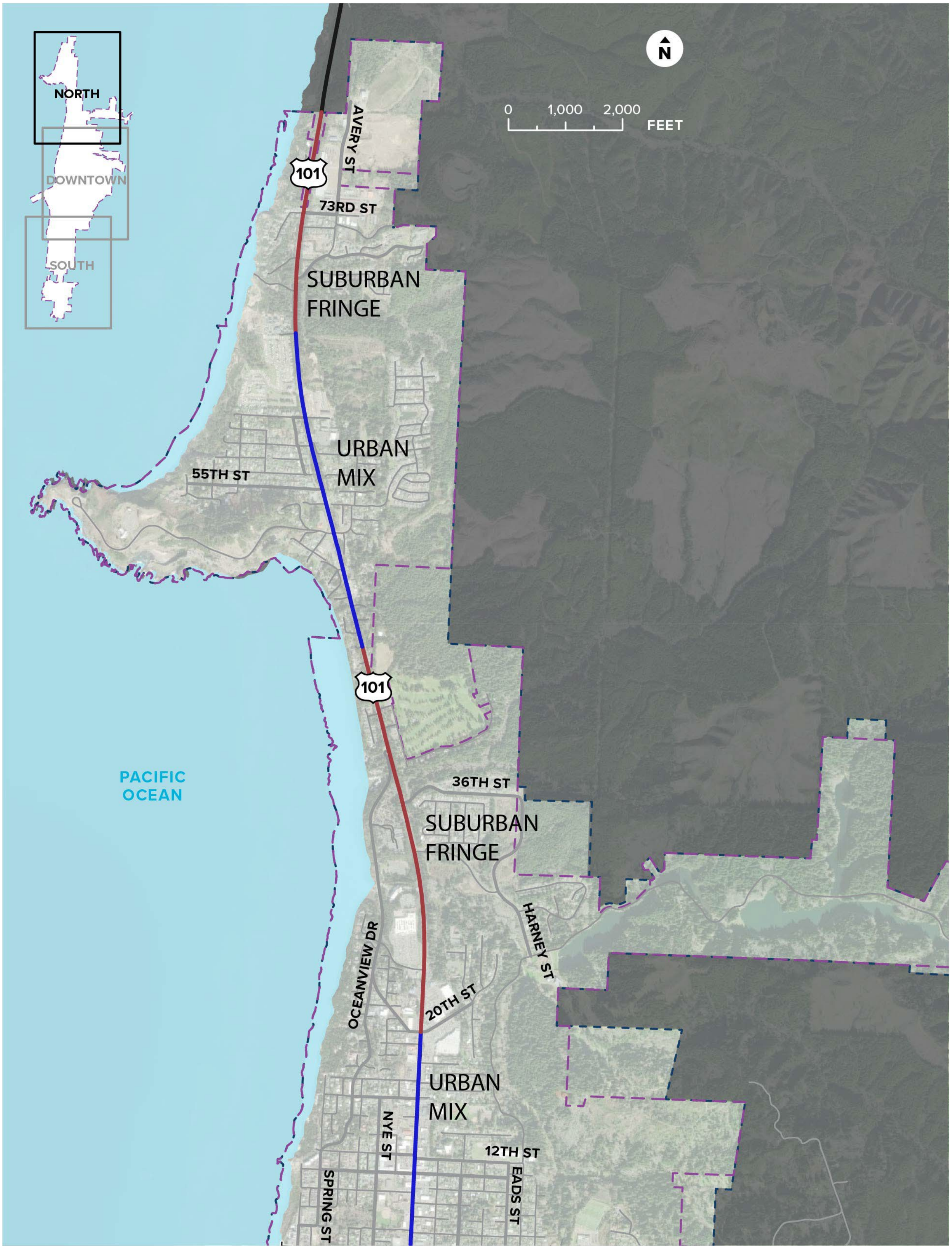
Title 13 Chapter	Suggested New Location	Notes
13.05.001 Purpose	14.100.001 Purpose	Move to new section, review ORS citations for continued relevance.
13.05.005 Definitions	14.01.020 Definitions	Transportation definitions have been evaluated and updated as part of Reference 2/14. Other definitions may conflict with those of Title 14.
13.05.010 Standards	N/A	Recommend removing, this section is not necessary to retain.
13.05.020 Blocks	14.100.020 Blocks	
13.05.025 Easements	14.100.025 Easements	
13.05.30 Lots and Parcels	14.100.030 Lots and Parcels	
13.5.035 Public Improvements	14.100.035 Public Improvements	This section identifies procedures and can be combined with the following section which addresses substantive items.
13.05.040 Public Improvement Requirements	14.100.035 Public Improvements	Can be combined with previous item.
13.05.045 Adequacy of Public Facilities and Utilities	14.100.045 Adequacy of Public Facilities and Utilities	
13.05.050 Underground Utilities and Service Facilities	14.100.050 Underground Utilities and Service Facilities	

Title 13 Chapter	Suggested New Location	Notes
13.05.055 Street Lights	14.100.105 Miscellaneous	This brief section could be incorporated into a "miscellaneous" section. If the City has adopted street light standards as this code section indicates, this section should be updated.
13.05.060 Street Signs	14.100.105 Miscellaneous	This brief section could be incorporated into a "miscellaneous" section.
13.5.065 Monuments	14.100.105 Miscellaneous	This brief section could be incorporated into a "miscellaneous" section.
13.05.070 Land Division Application	14.100.070 Land Division Application or 14.52 – Procedural Requirements	
13.05.075 Preliminary Review and Notice of Hearing	14.100.075 Preliminary Review and Notice of Hearing or 14.52 – Procedural Requirements	
13.05.080 Hearing and Approval of Land Division	14.100.080 Hearing and Approval of Land Division or 14.52 – Procedural Requirements	
13.05.085 Approval Criteria and Conditions for Approval	14.100.085 Approval Criteria and Conditions for Approval or 14.52 – Procedural Requirements	
13.05.090 Final Plat Requirements for Land Divisions	14.100.090 Final Plat Requirements for Land Divisions or 14.52 – Procedural Requirements	These procedural sections could be moved to new sections within Title 14, or incorporated into the existing Chapter 14.52 – Procedural Requirements. The later option would result in a more intelligible code overall, but would require more effort.

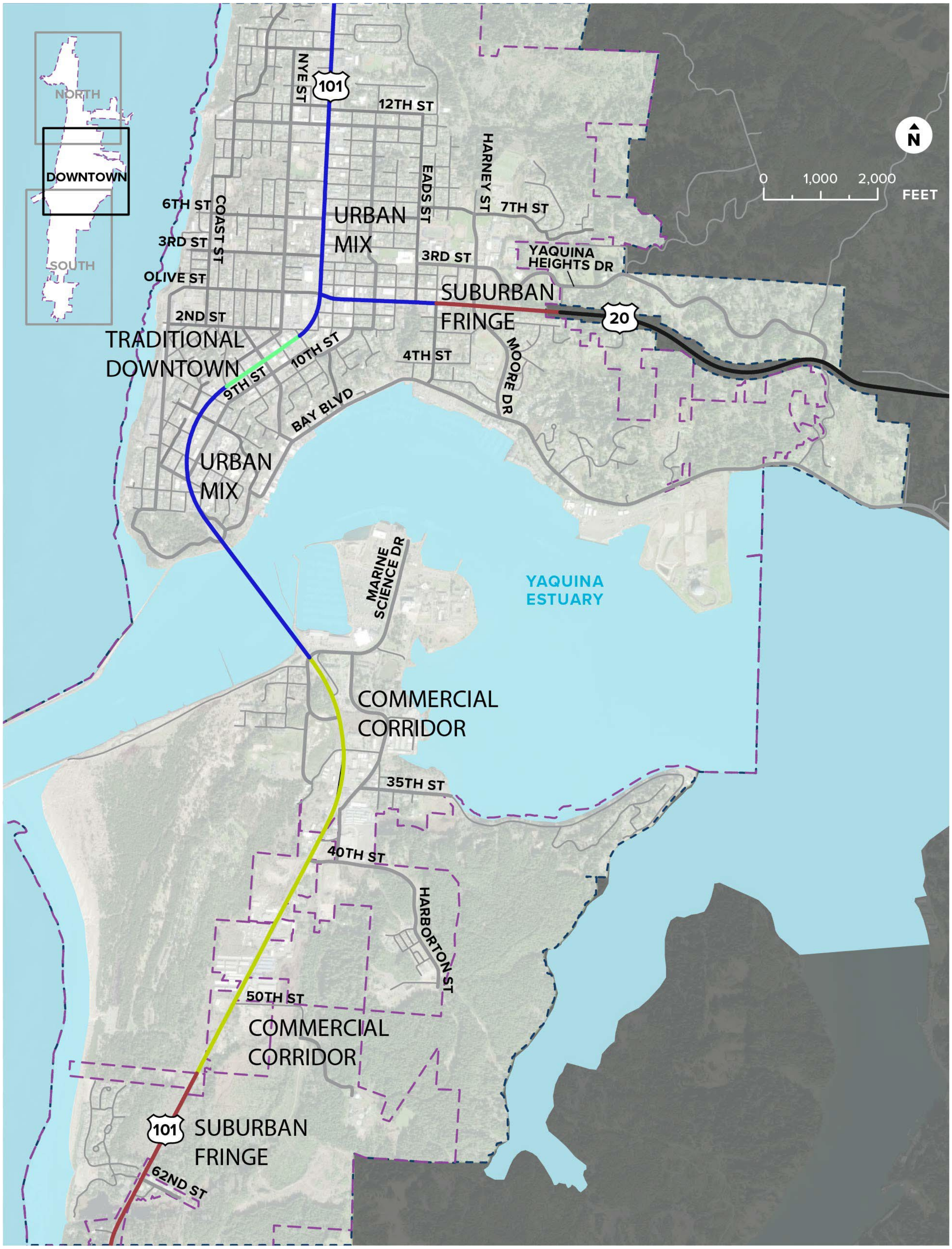
Title 13 Chapter	Suggested New Location	Notes
13.05.095 Minor Replats and Partitions	14.100.095 Minor Replats and Partitions	This section could be moved to a new location with updates to needed references.
13.05.100 Cemeteries	14.100.105 Miscellaneous	This brief section could be combined with 13.05.105 and 13.50 to a new “miscellaneous” section.
13.05.105 Miscellaneous	14.100.105 Miscellaneous	This brief section could be combined with 13.05.100 and 13.50 to a new “miscellaneous” section.
13.50 Standards After Subdivision Approval	14.100.105 Miscellaneous	This brief section could be combined with 13.05.105 and 13.100 to a new “miscellaneous” section.
13.99 Property Line Adjustments	14.110 Property Line Adjustments	This section could be moved to a new location with updates to needed references.

APPENDIX O- ODOT URBAN CONTEXTS

ODOT URBAN CONTEXTS – NORTH MAP AREA

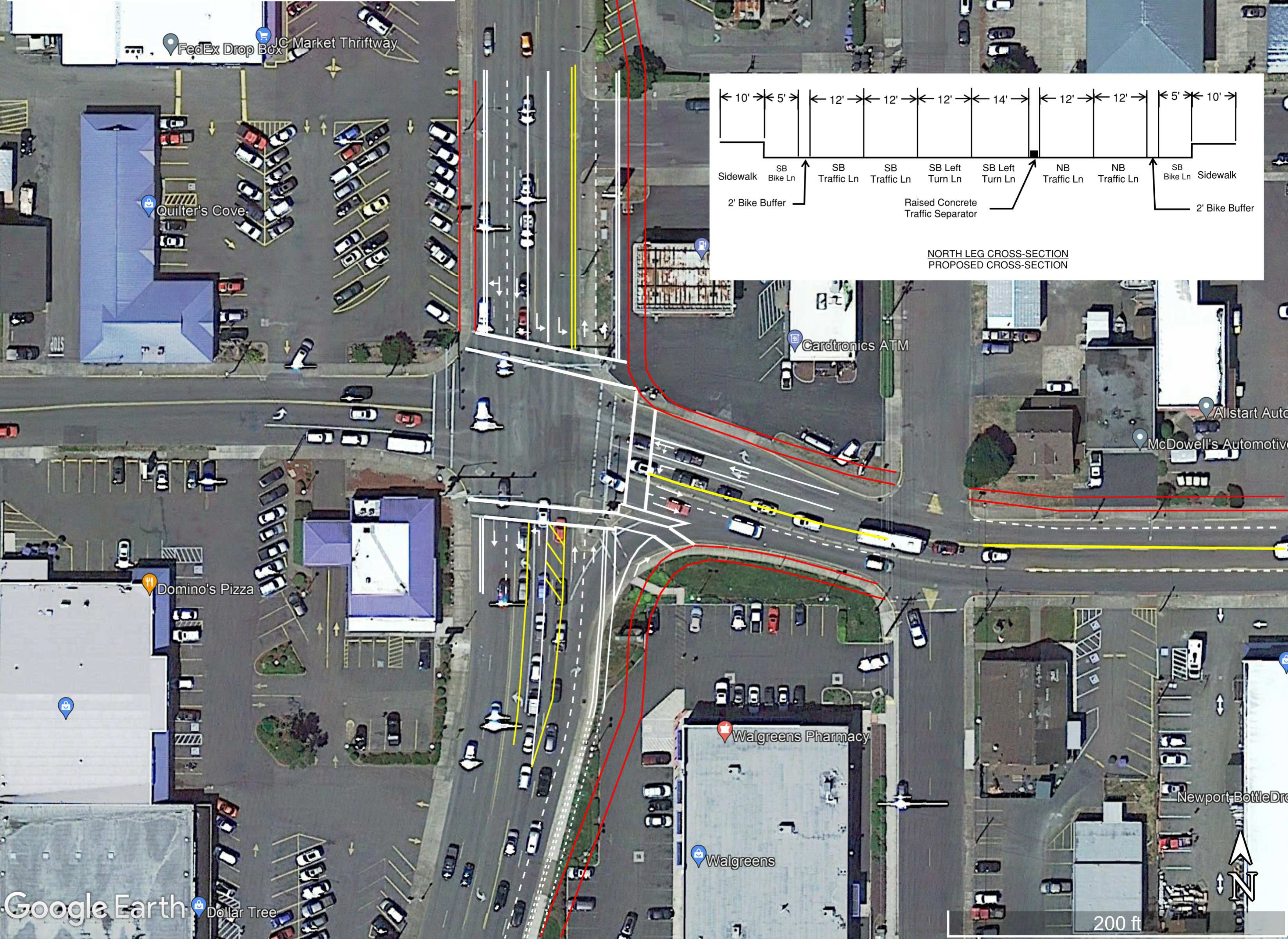


ODOT URBAN CONTEXTS – DOWNTOWN AND SOUTH MAP AREA

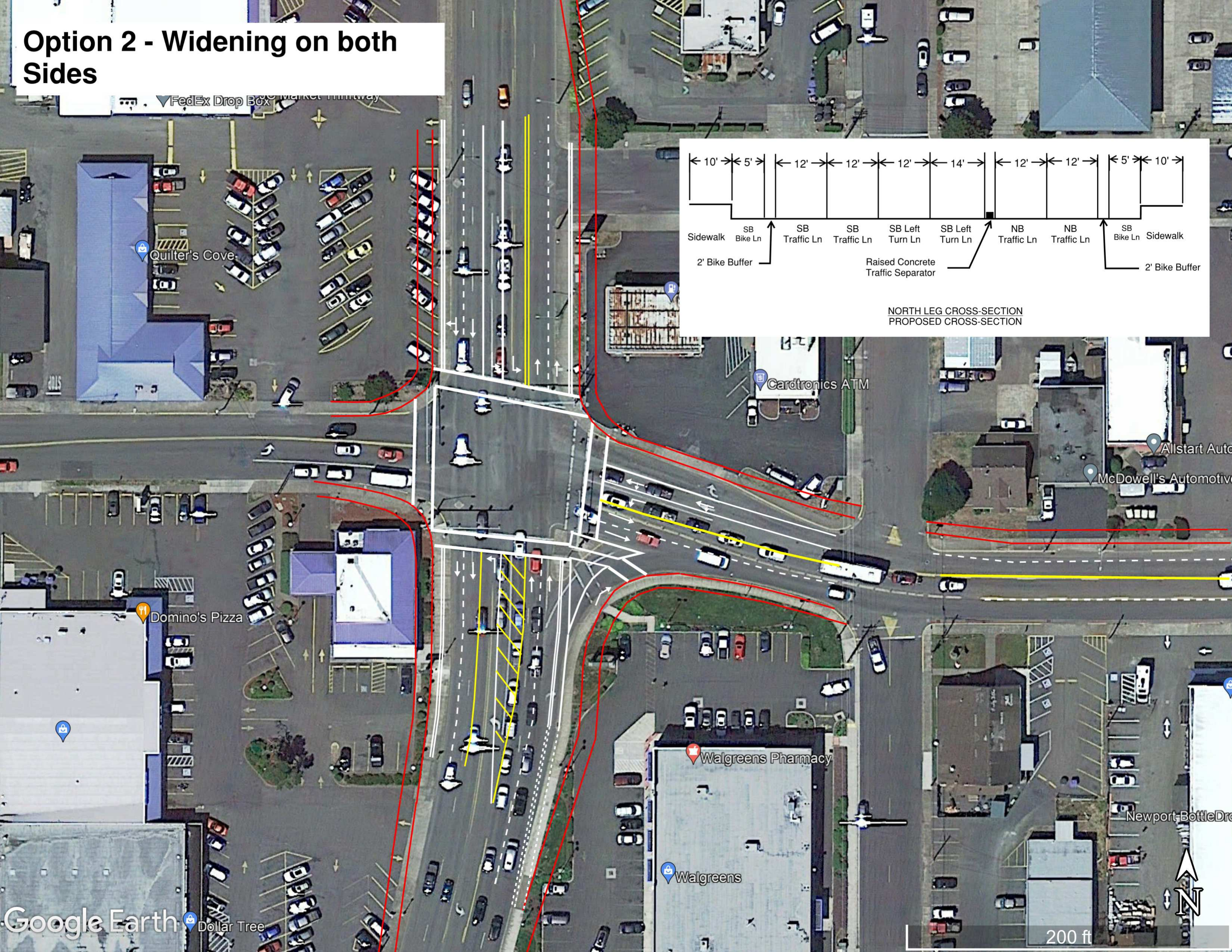


APPENDIX P- US 101/US 20 CONCEPTUAL SKETCHES

Option 1 - Widening to the East



Option 2 - Widening on both Sides



APPENDIX Q- HARNEY STREET EXTENSION CONCEPTUAL DETAILS

Newport Harney Bypass Route
Conceptual 10% Design / Estimate - Summary

Job No. DKS-40
Date: June 21, 2021

Major Street Segments	Estimated Cost
Newport Harney Bypass Route	$ 58,400,000

Major Intersections/Structures	Estimated Cost
Newport Harney Bypass / NE 7th St	$ 800,000
Newport Harney Bypass / NE Big Creek Rd	$ 800,000

Total Project Development Cost (10%) $ 60,000,000

Newport Harney Bypass Route

Conceptual 10% Design / Estimate - Summary

Job No. DKS-40
Date: June 21, 2021

Global Cost Assumptions			
Construction Cost Contingency	%	30%	
Contractor LS Incidental	%	15%	(Mob, TPDT, EC, RSO, Staking, etc.)
Capital Project Mgmt. (construction)		5.0%	
Design Engineering		10.0%	
Design Survey		1.5%	
Public Involvement		0.5%	
Const. Engineering Support		6.0%	
Inspection		5.0%	
Roadwork			Assumptions
Bridge Substructure	SQFT	$ 300.00	
Concrete Curb & Gutter	FOOT	$ 28.00	
Concrete Curb, Std. Type C	FOOT	$ 20.00	
Concrete Curb, Low Profile Mountable	FOOT	$ 25.00	
Sidewalk	SQFT	$ 7.00	
Concrete Median (Paving)	SQFT	$ 20.00	excludes curb
Asphalt Mixture	TON	$ 100.00	
Aggregate Base	CUYD	$ 78.00	
Geotextile Fabric	SQYD	$ 1.00	
Earthwork	CUYD	$ 30.00	
Topsoil	CUYD	$ 45.00	
Bark Mulch (3" depth)	CUYD	$ 90.00	
Groundcovers	SQFT	$ 15.00	At 12" OC spacing, approx. 1/SF
Street Trees	EACH	$ 650.00	
Root Barrier	FOOT	$ 10.00	
Irrigation	SQFT	$ 4.00	
Storm Main (24" dia)	FOOT	$ 240.00	
Storm Lateral (12" dia)	FOOT	$ 115.00	
Storm Manhole (48" dia)	EACH	$ 5,000.00	
Storm Catch Basin	EACH	$ 3,000.00	
Water Quality & Detention	SQFT	$ 20.00	using 6% of imp. Area
Sanitary Main (24" dia)	FOOT	$ 350.00	
Sanitary Main (8" dia)	FOOT	$ 150.00	no laterals - to be installed with development
Sanitary Manhole (60" dia)	EACH	$ 15,000.00	
Sanitary Manhole (48" dia)	EACH	$ 9,000.00	
Water Main (18" DI)	FOOT	$ 225.00	
Water Main (8" DI)	FOOT	$ 110.00	
Fire Hydrants (w/ lat & fittings)	EACH	$ 10,000.00	
Purple Pipe (12" PVC)	FOOT	$ 100.00	
Streetlights (incl conduit)	EACH	$ 4,000.00	
Joint Trench	FOOT	$ 40.00	
Underground Power (vaults)	EACH	$ 15,000.00	
Underground Power (conduit)	FOOT	$ 10.00	
Right-of-Way			
Right-of-Way (SF)	SQFT	$ 10.00	Note: ROW costs are budgetary only and appraisals have not been completed or a value established.
Easement (SF)	SQFT	$ 2.00	Note: ROW costs are budgetary only and appraisals have not been completed or a value established.

Newport Harney Bypass Route

Conceptual 10% Design / Estimate - Summary

Roadway Section Analysis

Job No. DKS-40

Date: June 21, 2021

Major Intersections

Includes extra width for turn lanes, signals, interconnect, ROW, ADA ramps, ped buttons, etc.

Intersection		Newport Harney Bypass / NE 7th St	Newport Harney Bypass / NE Big Creek Rd
Construction Cost			
	LS Base Cost:	$ 400,000	$ 400,000
30%	Const. Contingency:	$ 120,000	$ 120,000
	Construction Subtotal:	$ 520,000	$ 520,000
15%	Construction Incidentals:	$ 78,000	$ 78,000
	Total Construction Cost	**$ 598,000**	**$ 598,000**
Professional Services (Design & Construction)			
5%	Cap. Proj Mgmt. (des & con)	$ 29,900	$ 29,900
10%	Design Engineering	$ 59,800	$ 59,800
2%	Design Survey	$ 8,970	$ 8,970
1%	Public Involvement	$ 2,990	$ 2,990
6%	Const. Engineering Support	$ 35,880	$ 35,880
5%	Inspection	$ 29,900	$ 29,900
	Total Professional Services	**$ 167,440**	**$ 167,440**
Right-of-Way			
	Extra R/W at Intersections		
	Total R/W Services	**$ -**	**$ -**
	Total Intersection Cost	**$ 765,440**	**$ 765,440**

Note: ROW costs are budgetary only and appraisals have not been completed or a value established.

Newport Harney Bypass Route
Conceptual 10% Design / Estimate - Summary
Roadway Section Analysis
Job No. DKS-40
Date: June 21, 2021

Road Section: Newport Harney Bypass Route

Typical Road Section	
Asphalt	8
Agg. Base	14

Road Section Data Entry:

Segment	Begin STA	End STA	Length (ft)	Road		Right of Way		Public Utility Easements	
				Width (ft)	Area (sf)	Width (ft)	Area (sf)	Width (ft)	Area (sf)
Newport Harney Bypass Route			9,742	24.0	233,808	60.0	584,520	16.0	155,872
pullouts (2)			-		10,080		-		-
			-		-		-		-
			-		-		-		-
			9,742		243,888		584,520		155,872

Roadway Section Costs (Volume)

	Area (sf)	Depth (ft)	Volume (CY)	Wt (Ton)	Unit Price	Total
Asphalt (Ton)	243,888	0.67	6,021.93	12,766.48	$ 100.00	$ 1,276,648
Aggregate Base			19,793.00		$ 78.00	$ 1,543,854
Earthwork					LS	$ 12,985,980

Roadway Section Costs (Area)

	Width (ft)	Length (ft)	Area (sf)	SY	Unit Price	Total
Concrete Median		9,742	-		$ 20.00	$ -
Planted Median		9,742	-		$ 21.50	$ -
Sidewalk		9,742	-		$ 7.00	$ -
Landscape Strip		9,742	-		$ 21.50	$ -
Geotextile Fabric	-	-	-	50,782	$ 1.00	$ 50,782
W.Q. & Detention			14,633		$ 20.00	$ 292,666

Roadway Section Costs (Length)

	Length (ft)	No. of Times	Total Length	LS	Unit Price	Total
Curb & Gutter	9,742		-		$ 28.00	$ -
Concrete Curb, Std. Type C	9,742		-		$ 20.00	$ -
Concrete Curb, Low Profile Mountable	9,742		-		$ 25.00	$ -
Street Trees	9,742		-		$ 25.00	$ -
Street Lights	9,742		-		$ 40.00	$ -
Storm System	9,742	1	9,742		$ 308.80	$ 3,008,330
Joint Trench + PGE	9,742	1	9,742		$ 117.50	$ 1,144,685
3 Sided Box Culvert Crossing			1,158		$ 300.00	$ 347,400
Retaining Walls				$6,588,180		$ 6,588,180

		Combined Items Subtotal:	$ 27,238,524
Contingency	30%		$ 8,171,557
		Construction Subtotal:	**$ 35,410,082**
Construction Incidentals	15%		$ 5,311,512
		Total Construction Cost	**$ 40,721,594**

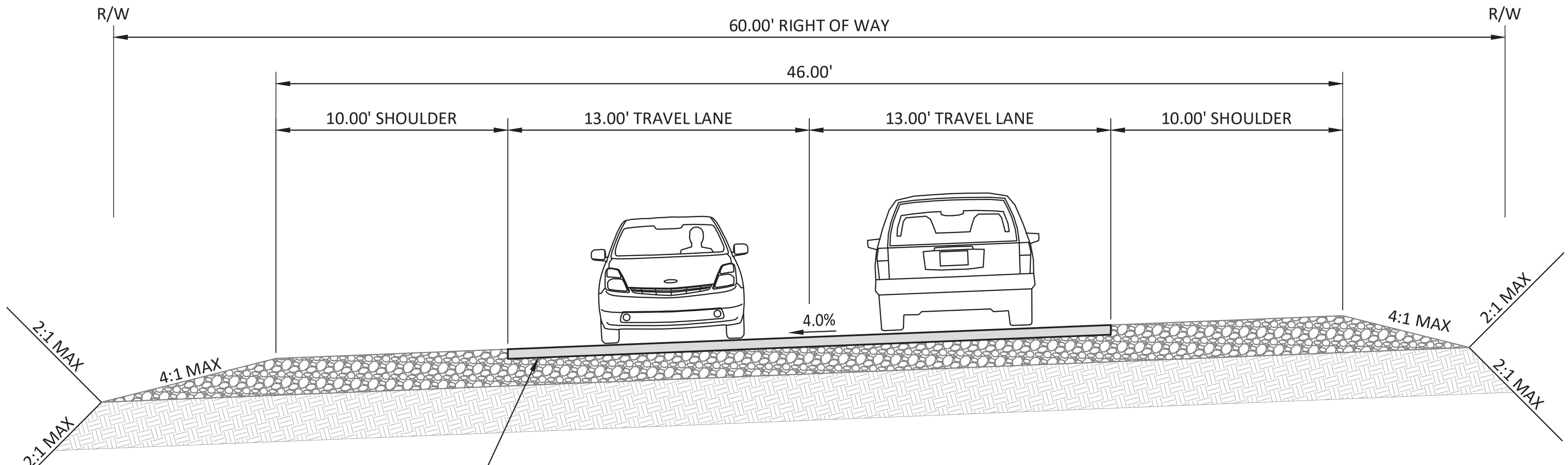
Professional Services (Design & Construction)

Capital Project Mgmt. (construction)	5.0%	$ 2,036,080
Design Engineering	10.0%	$ 4,072,159
Design Survey	1.5%	$ 610,824
Public Involvement	0.5%	$ 203,608
Const. Engineering Support	6.0%	$ 2,443,296
Inspection	5.0%	$ 2,036,080
	Professional Services Total:	**$ 11,402,046**

Right-of-Way

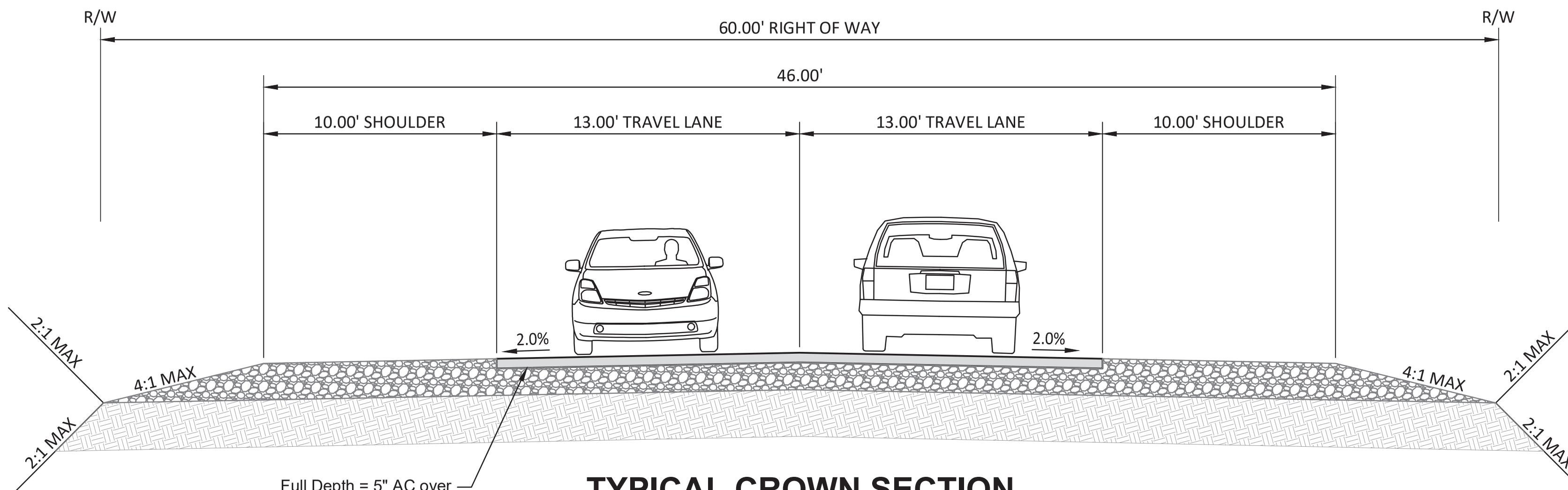
	Area (sf)	Reduce %	Area (sf)	Unit Price	Total
Right-of-Way	584,520		584,520	$ 10.00	$ 5,845,200
PUE's	155,872		155,872	$ 2.00	$ 311,744
Wall Easements	72,460		72,460	$ 2.00	$ 144,920
				Right-of-Way Subtotal	**$ 6,301,864**

Total Project Cost: $ 58,425,504



TYPICAL SHED SECTION

SCALE: 1" = 5'



TYPICAL CROWN SECTION

SCALE: 1" = 5'

PRELIMINARY

TYPICAL SECTIONS

NEWPORT HARNEY BYPASS ROUTE

NEWPORT, OREGON

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
phone: 503.221.1131 www.hhpr.com fax: 503.221.1171

DESIGNED:	CAB
DRAWN:	TLH
CHECKED:	CAB
DATE:	4/22/2021

REVISIONS

DATE	NO.	DESCRIPTION

SHEET NO. 1

JOB NO. DKS-40

P:\DKS (DKS)\DKS-40 (Newport TSP)\DKS40-DWGS\SHEETS\ DKS40-Typ-Sec.dwg

PROPERTY INFORMATION				
NO.	TAX LOT	TAX MAP	OWNER	SITE ADDRESS
1	11-11-05-DD-04200-00	11s11w05DD	LINCOLN COUNTY	633 NE 3RD ST
2	11-11-04-CC-01800-00	11s11w04CC	LINCOLN COUNTY	880 NE 7TH ST; 840 NE 7TH ST; 830 NE 7TH ST
3	11-11-04-CC-01700-00	11s11w04CC	BRIDGEVIEW HEIGHTS LLC	NO SITUS
4	11-11-05-DD-00100-00	11s11w05DD	CITY OF NEWPORT	NO SITUS
5	11-11-05-DA-00500-00	11s11w05DA	JOLING, MICHAEL R & PATRICIA S PATRICK JOLING	840 NE ILER ST
6	11-11-05-DA-00501-00	11s11w05DA	JOLING, MICHAEL R & PATRICIA S PATRICK JOLING	NO SITUS
7	11-11-05-DA-00502-00	11s11w05DA	CITY OF NEWPORT	NO SITUS
8	11-11-05-DA-00400-00	11s11w05DA	CITY OF NEWPORT	NO SITUS
9	11-11-05-DA-00300-00	11s11w05DA	CITY OF NEWPORT	NO SITUS
10	11-11-04-CB-01901-00	11s11w04CB	LINCOLN COUNTY SCHOOL DIST	NO SITUS
11	11-11-04-CB-01900-00	11s11w04CB	BRIDGEVIEW HEIGHTS LLC	NO SITUS
12	11-11-04-CB-00100-00	11s11w04CB	BOWDER, BRADLEY R & SHERYL L	NO SITUS
13	11-11-04-00-00201-00	11s11w04	LINCOLN COUNTY SCHOOL DIST	NO SITUS
14	11-11-04-00-00200-00	11s11w04	BRIDGEVIEW HEIGHTS LLC	NO SITUS
15	11-11-04-00-00100-00	11s11w04	GIBSON, KENT	2830 NE BIG CREEK RD
16	11-11-05-00-00401-00	11s11w05	GIBSON, KENT	NO SITUS
17	11-11-05-00-00400-00	11s11w05	CITY OF NEWPORT	1212 NE FOGARTY ST
18	10-11-33-00-00600-00	10s11w33	CITY OF NEWPORT	2510 NE BIG CREEK RD; 2810 NE BIG CREEK RD
19	10-11-33-00-00701-00	10s11w33	WARREN, TONIA K	2820 NE BIG CREEK RD
20	10-11-33-CB-08603-00	10s11w33CB	CITY OF NEWPORT	NO SITUS
21	10-11-33-CB-09400-00	10s11w33CB	SPROUL, DANIEL I & SUSIE K	2710 NE HARNEY DR

City Limits

Proposed ROW

Proposed CL

Proposed limit of cut slope

Proposed limit of fill slope

Proposed retaining wall

Drainageway crossing with proposed 3 sided bridge or open bottom box culvert

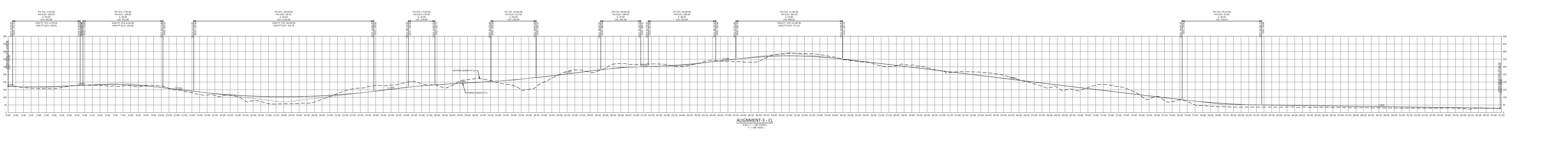
Reroute drainageway

* Proposed intersection modification for side road

10 Designated property number

SCALE: 1" = 100'

Alignment-3 Plan
Newport Harney Bypass Route
Newport TSP
4/22/2021
DKS-40
1 of 1



ALIGNMENT-3 - CL

SCALE: 1" = 100' (HORIZ.)
1" = 100' (VERT.)

APPENDIX R- FINANCIALLY CONSTRAINED PROJECTS

FINANCIALLY CONSTRAINED PROJECTS

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
INT4	**US 101/US 20** Construct a second southbound left turn lane. Requires a signal modification, widening along US 101 and along the south side of US 20 to support a second receiving lane, and conversion of the US 101/NE 1st Street intersection to right-in, right-out movements only.	NURA	$5,000,000	Tier 1	Downtown
INT6	**US 20/SE Moore Drive/NE Harney Street** Improve the intersection with a rebuilt traffic signal, and separate left turn lanes on the northbound and southbound approaches. Coordinate improvements with Project SBL1.	NURA	$4,000,000	Tier 1	Downtown
INT9	**US 101/SW 40th Street** Improve the intersection with a traffic signal or roundabout. Cost assumes installation of a traffic signal, curb ramps, striping, signing and repaving, as identified in the South Beach Refinement Plan.	SBURA	$1,550,000	Tier 1	South
EXT1	**NW Gladys Street (from NW 55th Street to NW 60th Street)** Improve NW Gladys Street to create a continuous neighborhood collector street.	NURA	$1,100,000	Tier 2	North
EXT12	**NW Nye Street (from NW Oceanview Drive to NW 15th Street)** Extend/Improve NW Nye Street to create a continuous neighborhood collector street between NW Oceanview Drive and NW 15th Street. Cost assumes bridge will be needed, installation of a sidewalk, and signing and striping as needed to designate a shared bike route. Project EXT12 will only be constructed if the full street connection is preferred over the shared-use path only option (Project TR14).	City/State Funds	$3,100,000	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
REV1	**NW Oceanview Drive (from NW Nye Street Extension to NW 12th Street)** Convert NW Oceanview Drive to one-way southbound between the NW Nye Street Extension and NW 12th Street and shift northbound vehicle traffic to NW Nye Street. Cost assumes utilization of the existing roadway width to include a southbound travel lane for vehicles, and an adjacent shared use path for pedestrians and bicycles. Project EXT12 must be completed as a full street extension and must be constructed first for REV1 to be constructed.	City/State Funds	$350,000	Tier 1	North, Downtown
REV2	**NW 55th Street (from NW Gladys Street to NW Pinery Street)** Improve the roadway surface. Project to be coordinated with Project BR16 and SW24.	NURA	$200,000	Tier 1	North
REV5	**Yaquina Bay Bridge Refinement Plan** Conduct a study to identify the preferred alignment of a replacement bridge, typical cross-section, implementation, and feasibility, and implement long-term recommendations from the Oregon Coast Bike Route Plan.	City/State Funds	$500,000	Tier 1	Downtown, South
REV6	**US 101 and SW 9th Street (from SW Abbey Street to SW Angle Street)** Provide an enhanced two-way version of US 101, or convert US 101 to one-way southbound between SW Abbey Street and SW Angle Street, and shift northbound US 101 to SW 9th Street. Cost assumes cross-sections as identified in Chapter 5 of this TSP, construction of new roadway segments to transition northbound traffic to and from SW 9th Street, and some intersection and crossing improvements. Specific treatments will be identified during design phase of the project.	NURA	$11,700,000	Tier 1	Downtown
REV7	**US 20 (from US 101 to NE Harney Street)** Enhance the existing street cross-section with widened sidewalks and new landscape buffers. Cost assumes cross-sections as identified in Chapter 5 of this TSP, with on-street bicycle lanes only provided between SE Fogarty Street and NE Harney Street. Requires a design exception and documented public acceptance. Parallel bicycle facilities provided between US 101 and SE Fogarty Street in Project BR5, TR12 and BL3.	NURA	$6,500,000	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
SW2	**NE 3rd Street (from NE Eads Street to NE Harney Street)** Complete existing sidewalk gaps.	City/State Funds	$950,000	Tier 2	Downtown
SW3	**SW Elizabeth Street (from W Olive Street to SW Government Street)** Complete existing sidewalk gaps.	City/State Funds	$2,600,000	Tier 2	Downtown
SW6	**NE 7th Street (from NE Eads Street to NE 6th Street)** Complete existing sidewalk gaps.	City/State Funds	$2,175,000	Tier 2	Downtown
SW8	**NE Harney Street (from US 20 to NE 3rd Street)** Complete existing sidewalk gaps.	NURA	$700,000	Tier 2	Downtown
SW11	**SE Benton Street/SE 2nd Street/SE Coos Street/NE Benton Street (from SE 10th Street to NE 12th Street)** Complete existing sidewalk gaps.	City/State Funds	$3,050,000	Tier 2	North, Downtown
SW12	**SW 2nd Street (from SW Elizabeth Street to SW Nye Street)** Complete existing sidewalk gaps.	City/State Funds	$1,275,000	Tier 2	Downtown
SW13	**NW Nye Street (from W Olive Street to NW 15th Street)** Complete existing sidewalk gaps.	City/State Funds	$4,450,000	Tier 2	North, Downtown
SW14	**NW/NE 11th Street (from NW Spring Street to NE Eads Street)** Complete existing sidewalk gaps.	City/State Funds	$2,150,000	Tier 2	North, Downtown
SW16	**NW Edenview Way/NE 20th Street (from NW Oceanview Drive to NE Crestview Drive)** Complete existing sidewalk gaps.	City/State Funds	$2,475,000	Tier 2	North
SW18	**SE 35th Street (from SE Ferry Slip Road to South Beach Manor Memory Care)** Complete existing sidewalk gaps as identified in the South Beach Refinement Plan.	SBURA	$750,000	Tier 1	South
SW19	**NW 8th Street/NW Spring Street (from NW Coast Street to NW 11th Street)** Complete existing sidewalk gaps.	City/State Funds	$1,175,000	Tier 2	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
SW20	**NW Gladys Street/NW 55th Street (from NW 60th Street to US 101)** Complete existing sidewalk gaps.	NURA	$1,425,000	Tier 2	North
SW21	**US 101 (from NW 25th Street to NE 31st Street)** Construct pedestrian path on east side of US 101. Cost assumes 10-ft wide sidewalk with sheet pile wall.	NURA	$3,100,000	Tier 1	North
SW29	**US 101 (from SE Ferry Slip Road to SE 40th Street)** Complete the sidewalk gaps on the east side.	City/State Funds	$425,000	Tier 2	South
TR1	**NW Oceanview Drive (from US 101 to NW Nye Street Extension)** Construct a shared use path on one side. The short term improvement along this segment included in Project BR15.	City/State Funds	$4,775,000	Tier 1	North
TR3	**US 101 (from NW Lighthouse Drive to NW Oceanview Drive)** Construct a shared use path on the west side of US 101, with sidewalk infill on the east side. Shared use path project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path). Cost included with Project TR8.	Federal Funds/ NURA	Included with Project TR8	Tier 1	North
TR6	**NE Big Creek Road (from NE Fogarty Street to NE Harney Street)** Reconfigure the roadway to provide a shared use path. Cost assumes utilization of the existing roadway width to include a one-way 12 ft. travel lane and an adjacent shared use path.	City/State Funds	$450,000	Tier 1	North, Downtown
TR7	**Water Tank Trail (from Newport Water Tank to Communications Hill Trail)** Construct a shared use path between the Newport Water Tank and the Communications Hill Trail, as identified by the BLM/FHWA. Cost included with Project TR8.	Federal Funds/ NURA	Included with Project TR8	Tier 1	North
TR8	**NW Lighthouse Drive (from US 101 to terminus)** Construct a shared use path on one side and other improvements as identified by the BLM/FHWA. Cost includes pedestrian/bicycle crossing improvements at the intersection of US 101/NW Lighthouse Drive, and Projects TR3 and TR7.	Federal Funds/ NURA	$4,000,000	Tier 1	North

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
TR12	**SE 1st Street (from SE Douglas Street to SE Fogarty Street)** Construct a shared use path. Cost assumes bridge will be needed.	NURA	$2,550,000	Tier 1	Downtown
TR13	**South Beach Improvements** Pedestrian and bicycle priority improvements as identified in the South Beach Refinement Plan. This project does not include the cost associated with Project SW18.	SBURA	$700,000	Tier 1	South
TR14	**NW Nye Street (from NW Oceanview Drive to NW Nye Street)** Construct a shared use path. Cost assumes bridge will be needed. Project TR14 will only be constructed if the full street connection is not constructed (Project EXT12).	City/State Funds	Included with Project EXT12	Tier 1	North, Downtown
BR1	**NE 12th Street (from NE Benton Street to NE Fogarty Street)** Install signing and striping as needed to designate a bike route.	City/State Funds	$25,000	Tier 1	North, Downtown
BR2	**NE Harney Street/NE 36th Street (from NE Big Creek Road to US 101)** Install signing and striping as needed to designate as interim shared bike route. Long term, on-street bike lanes to be provided as part of the Harney Street extension (Project EXT4). Cost assumes interim improvement only.	City/State Funds	$75,000	Tier 1	North
BR3	**NE Eads Street (from NE 1st Street to NE 12th Street)** Install signing and striping as needed to designate a bike route.	City/State Funds	$50,000	Tier 1	North, Downtown
BR5	**SE 1st Street (from SE Coos Street to SE Fogarty Street), SE Fogarty Street (from US 20 to SE 2nd Street), and SE 2nd Street (SE Fogarty Street to SE Moore Drive)** Install signing and striping as needed to designate a bike route. Project TR12 must be completed before/with Project BR5.	NURA	$25,000	Tier 1	Downtown
BR7	**SW 2nd Street/SW Angle Street (from SW Elizabeth Street to SW 10th Street)** Install signing and striping as needed to designate a bike route. Specific intersection treatments at US 101 and SW 9th Street intersections to be determined with Project REV6.	City/State Funds	$50,000	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
BR9	**NW Edenview Way/NE 20th Street (from NW Oceanview Drive to NW Crestview Drive)** Install signing and striping as needed to designate a bike route. Restripe through US 101/NE 20th Street intersection to provide on-street bike lanes between the NW Edenview Way/NW 20th Street intersection and the eastern Fred Meyer Driveway.	City/State Funds	$50,000	Tier 1	North
BR10	**NW 60th Street/NW Gladys Street/NW 55th Street (from US 101 to US 101)** Install signing and striping as needed to designate a bike route through Agate Beach.	NURA	$25,000	Tier 1	North
BR12	**NE Avery Street/NE 71st Street (from US 101 to NE Echo Court)** Install signing and striping as needed to designate a bike route.	City/State Funds	$50,000	Tier 1	North
BR13	**NW 3rd Street (from US 101 to NW Cliff Street)** Install signing and striping as needed to designate a bike route.	City/State Funds	$50,000	Tier 1	Downtown
BR14	**Yaquina Bay Bridge Interim Improvements** Install signing as needed to designate a bike route and implement other improvements as identified in the Oregon Coast Bike Route Plan such as flashing warning lights or advisory speed signs.	City/State Funds	$75,000	Tier 1	South
BR15	**NW Oceanview Drive Interim Improvements (from US 101 to NW Nye Street Extension)** Install signing and striping as needed to designate as an interim bike route and implement other improvements as identified in the Oregon Coast Bike Route Plan. Long term improvement along this segment included in Project TR1.	City/State Funds	$75,000	Tier 1	North
BR16	**NW 55th Street (from NW Gladys Street to NW Pinery Street)** Install signing and striping as needed to designate a bike route. Coordinate with Project REV2.	NURA	$50,000	Tier 1	North
BR17	**NW 6th Street (from NW Coast Street to NW Nye Street)** Install signing and striping as needed to designate a bike route.	City/State Funds	$25,000	Tier 1	Downtown
BR18	**NE 7th Street/NE 6th Street (from NE Eads Street to NE Laurel Street)** Install signing and striping as needed to designate a bike route.	City/State Funds	$50,000	Tier 1	Downtown

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
BR19	**NW Spring Street/NW Coast Street (from NW 12th Street to SW 2nd Street)** Install signing and striping as needed to designate a bike route.	City/State Funds	$75,000	Tier 1	North, Downtown
SBL1	**SE Moore Drive/NE Harney Street (from SE Bay Boulevard to NE 7th Street)** Restripe to install buffered bike lanes between SE Bay Boulevard and US 20; Widen to install buffered bike lanes between US 20 and NE Yaquina Heights Drive; Restripe and upgrade the existing on-street bike lanes between NE Yaquina Heights Drive and NE 7th Street (project removes on-street parking on one side only). Coordinate improvements through the US 20 intersection with Project INT6.	NURA	$825,000	Tier 1	Downtown
SBL2	**US 101 (from Yaquina Bay Bridge to SW Abbey Street)** Construct a separated bicycle facility on US 101. Note the specified facility design and project extents are subject to review and modification.	NURA	$1,350,000	Tier 1	Downtown
SBL4	**US 101 (from Yaquina Bay Bridge to SE 35th Street)** Construct a separated bicycle facility on US 101. Note the specified facility design and project extents are subject to review and modification.	City/State Funds	$925,000	Tier 1	South
BL1	**SW Canyon Way (from SW 9th Street to SW Bay Boulevard)** Restripe to provide on-street bike lanes in uphill direction and mark sharrows in the downhill direction (project may require conversion of angle parking near SW Bay Boulevard to parallel parking).	City/State Funds	$25,000	Tier 1	Downtown
BL2	**NW Nye Street/SW 7th Street (from NW 15th Street to SW Hurbert Street)** Restripe NW Nye Street to include on-street bicycle lanes (project removes on-street parking on one side only) between NW 15th Street and SW 2nd Street. Install signing and striping to designate SW 7th Street a shared bike route between SW 2nd Street and SW Hurbert Street.	City/State Funds	$100,000	Tier 1	North, Downtown
BL3	**NE 1st Street (from US 101/NE 1st Street intersection to US 20/NE Fogarty Street intersection)** Restripe to provide on-street bike lanes (project removes on-street parking on one side).	NURA	$100,000	Tier 1	Downtown

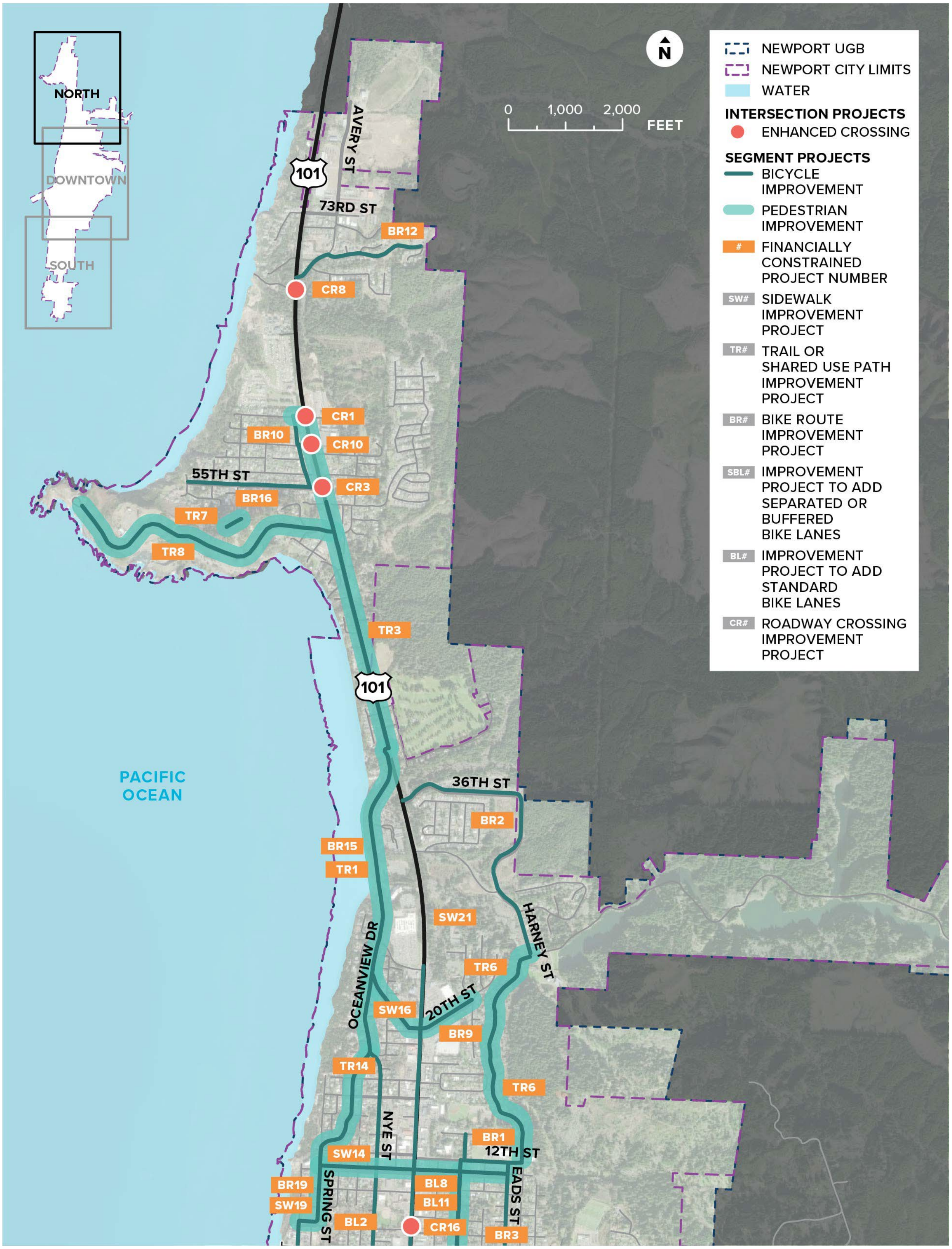
PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
BL4	**SW 9th Street (from US 101 to SW Fall Street)** Restripe or widen as needed to provide on-street bike lanes (project removes on-street parking).	NURA	$465,000	Tier 1	Downtown
BL5	**SW Bayley Street (from US 101 to SW Elizabeth Street)** Restripe to provide on-street bike lanes (project removes on-street parking on one side).	NURA	$25,000	Tier 1	Downtown
BL6	**SW Hurbert Street (from SW 9th Street to SW 2nd Street)** Restripe to provide on-street bike lanes (existing angle parking will be converted to parallel parking on one side). Specific intersection treatments at US 101 and SW 9th Street intersections to be determined with Project REV6.	NURA	$25,000	Tier 1	Downtown
BL7	**NW/NE 6th Street (from NW Nye Street to NE Eads Street)** Restripe or widen as needed to provide on-street bike lanes (project removes on-street parking on one side).	City/State Funds	$775,000	Tier 1	Downtown
BL8	**NW/NE 11th Street (from NW Spring Street to NE Eads Street)** Restripe to provide on-street bike lanes (project removes on-street parking on one side, although on-street parking may be impacted on both sides between NW Lake Street and NW Nye Street).	City/State Funds	$50,000	Tier 1	North, Downtown
BL9	**NE 3rd Street (from NE Eads Street to NE Harney Street)** Widen as needed to provide on-street bike lanes.	City/State Funds	$525,000	Tier 1	Downtown
BL11	**SW Angle Street/SW 10th Street/SE 2nd Street/SE Coos Street/NE Benton Street (from SW 9th Street to Frank Wade Park)** Restripe to provide on-street bike lanes (project removes on-street parking on one side between NE 12th Street and US 20). Install signing and striping to designate NE Benton Street a shared bike route between NE 12th Street and NE Chambers Street/Frank Wade Park. Note 5 ft. bike lanes assumed between US 20 and SE 2nd Street. Construct with Project CR2.	City/State Funds	$150,000	Tier 1	North, Downtown

PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
BL12	**SW Elizabeth Street (from SW Government Street to W Olive Street)** Restripe to provide on-street bike lanes (project removes on-street parking on one side).	City/State Funds	$75,000	Tier 1	Downtown
BL13	**W Olive Street (from SW Elizabeth Street to US 101)** Restripe to provide on-street bike lanes (project removes on-street parking on one side). Note project requires modification of existing curb extensions at Coast Street; on-street bike lanes may terminate prior to the US 101 intersection to provide space for turn pockets.	City/State Funds	$150,000	Tier 1	Downtown
BL14	**Yaquina Bay Road (from SE Moore Drive to SE Running Spring)** Restripe or widen as needed to provide on-street bike lanes.	City/State Funds	$1,625,000	Tier 1	Downtown
CR1	**NW 60th Street/US 101** Install an enhanced pedestrian and bike crossing to connect to the shared-use path on the east side of US 101.	NURA	$200,000	Tier 1	North
CR2	**SE Coos Street/US 20** Install an enhanced pedestrian and bicycle route crossing. Construct with Project BL11.	NURA	$200,000	Tier 1	Downtown
CR3	**NW 55th Street/US 101** Install an enhanced pedestrian and bike crossing to connect to the shared-use path on the east side of US 101.	NURA	$200,000	Tier 1	North
CR4	**NE Fogarty Street/US 20** Install an enhanced pedestrian and bicycle route crossing. This intersection should be designed to facilitate bicycle turn movements from US 20 on-street bike facilities to/from parallel bike facilities on side streets to the north and south. Construct with Project BR5 and/or Project BL3.	NURA	$200,000	Tier 1	Downtown
CR6	**SE 32nd Street/US 101** Install an enhanced pedestrian crossing.	City/State Funds	Funded	Tier 1	South

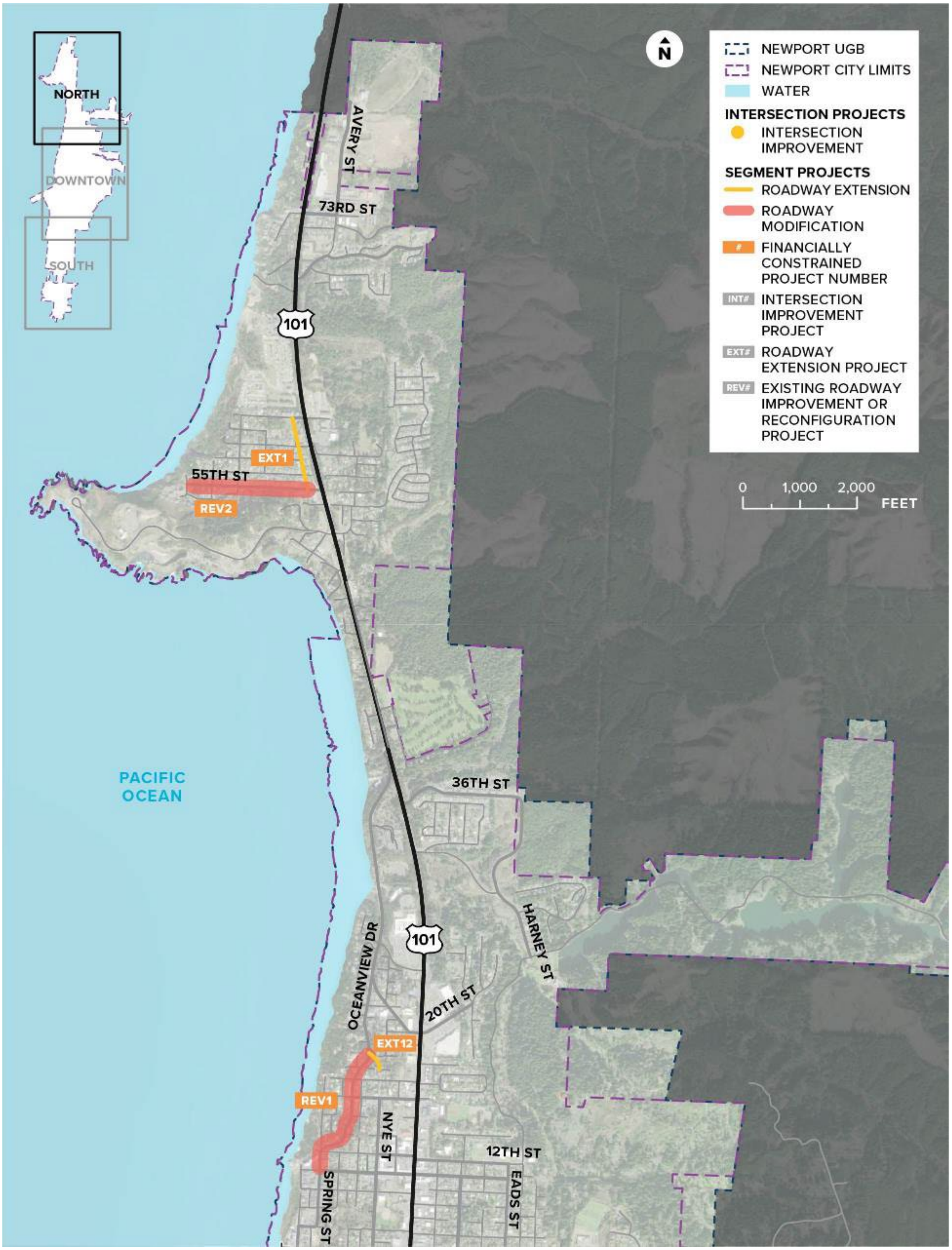
PROJECT ID*	PROJECT DESCRIPTION	POTENTIAL FUNDING SOURCE	ESTIMATED PROJECT COST (2021 DOLLARS)	PRIORITY HORIZON	MAP AREA
CR7	**SW Naterlin Drive/US 101** Improve pedestrian connections between Yaquina Bay Bridge and downtown Newport through pedestrian wayfinding, marked crossings, and other traffic control measures.	City/State Funds	$25,000	Tier 1	Downtown
CR8	**NW 68th Street/US 101** Install an enhanced pedestrian crossing.	City/State Funds	$200,000	Tier 1	North
CR10	**NW 58th/US 101** Install an enhanced pedestrian and bike crossing to connect to the shared-use path on the east side of US 101.	NURA	$200,000	Tier 1	North
CR16	**NW 8th/US 101** Install an enhanced pedestrian crossing.	NURA	$200,000	Tier 1	North, Downtown
CR18	**SW Bay/US 101** Install an enhanced pedestrian crossing.	NURA	$200,000	Tier 1	Downtown
PRO1	**Parking Management** Implement additional parking management strategies for the Nye Beach and Bayfront Areas. Strategies could include metering, permits, or other time restrictions.	City Funds	$600,000	Tier 1	n/a
PRO2	**Transportation Demand Management** Implement strategies to enhance transit use in Newport. Specific strategies could include public information, stop enhancements, route refinement, or expanded service hours.	City Funds	$475,000	Tier 2	n/a
PRO3	**Neighborhood Traffic Management** Implement a neighborhood traffic calming program.	City Funds	$475,000	Tier 1	n/a

Notes:* “INT” represents an intersection improvement project; “EXT” represents a roadway extension project; “REV” represents an existing roadway improvement or reconfiguration project; “SW” represents a sidewalk improvement project; “TR” represents a trail or shared use path improvement project; “BR” represents a bike route improvement project; “SBL” represents an improvement project to add separated or buffered bike lanes; “BL” represents an improvement project to add standard bike lanes; “CR” represents a roadway crossing improvement project; “PRO” represents a citywide demand or system management project.

FINANCIALLY CONSTRAINED MULTIMODAL PROJECTS- NORTH MAP AREA



FINANCIALLY CONSTRAINED MOTOR VEHICLE PROJECTS- NORTH MAP AREA



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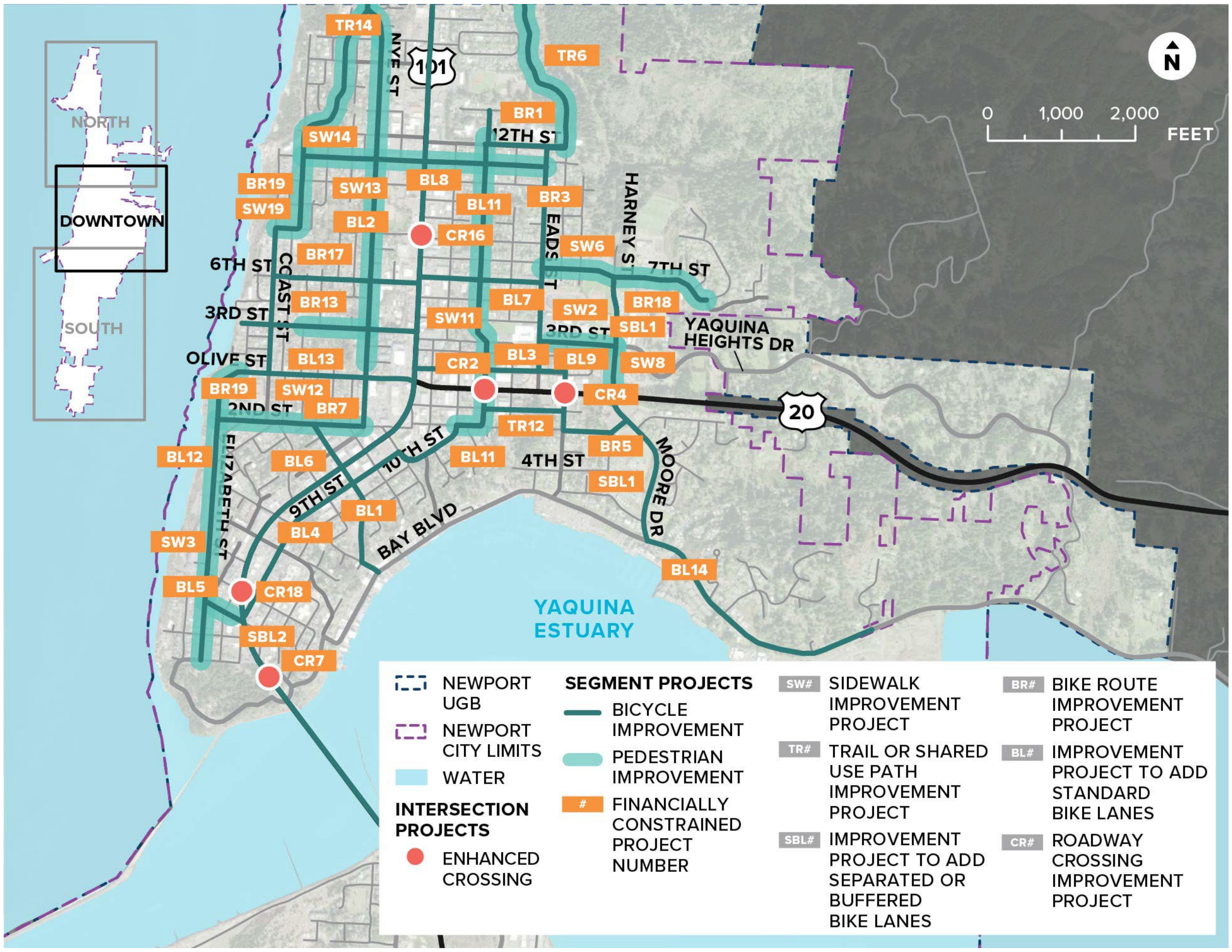

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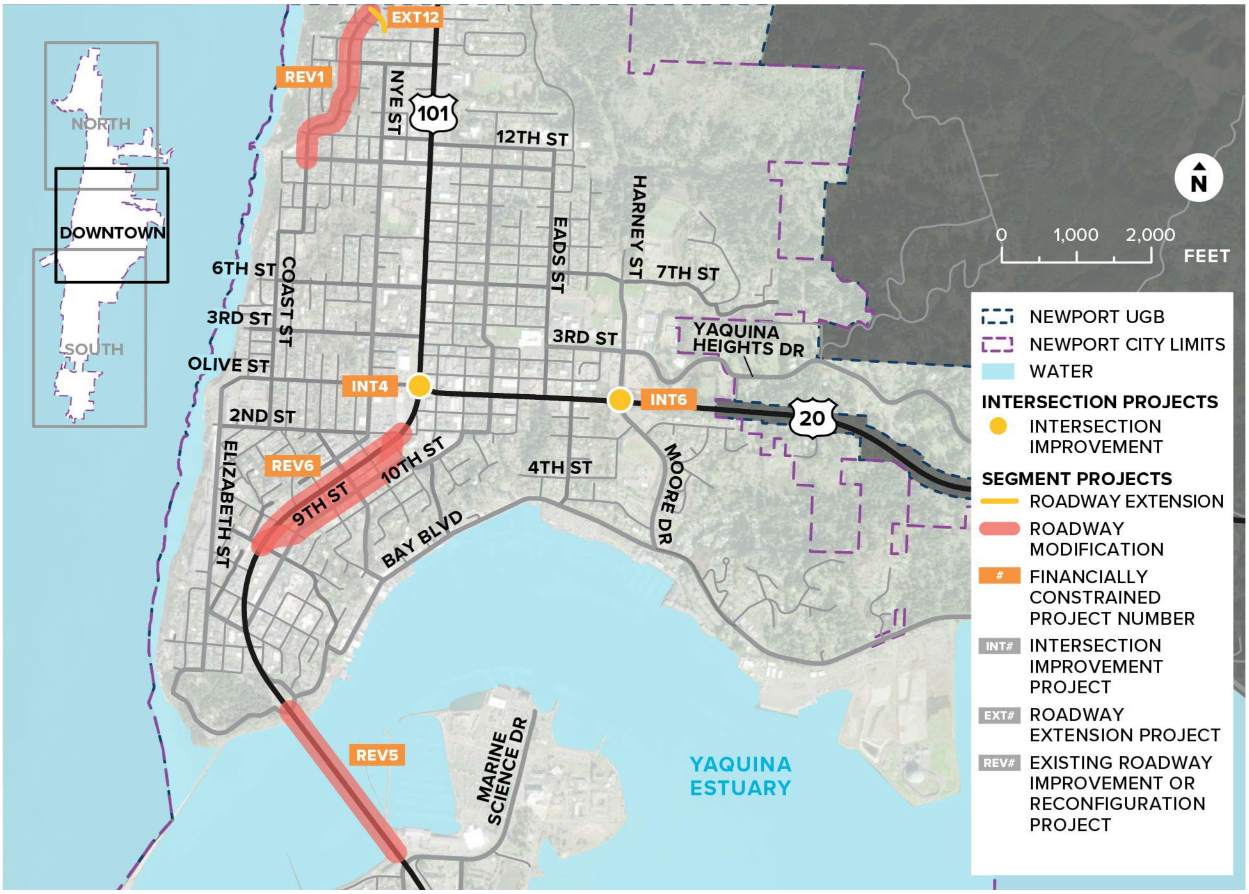

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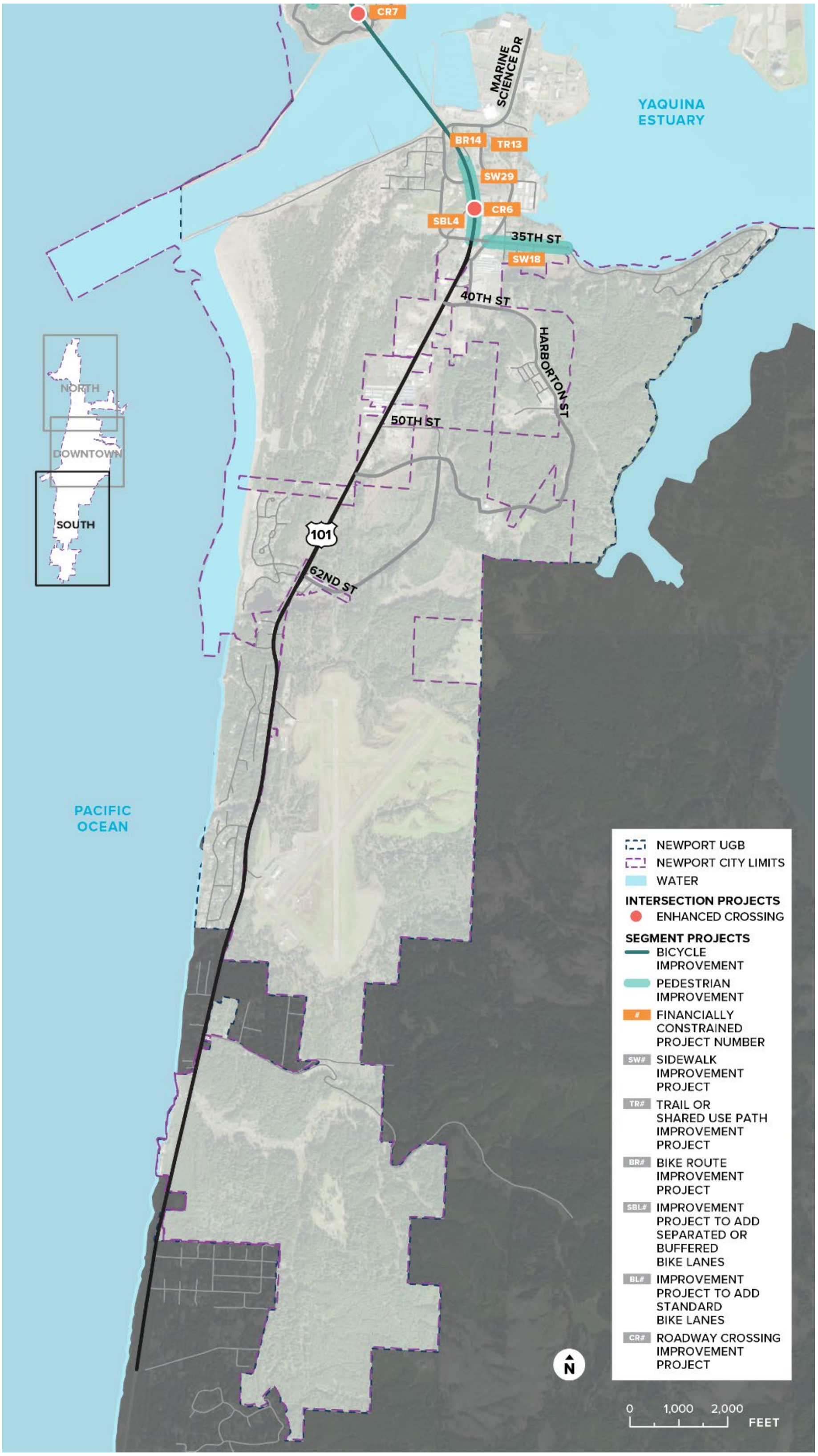

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