TECH MEMO #5: ALTERNATIVES ANALYSIS AND FUNDING PROGRAM

Date: March 27, 2023

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Project: City of Florence Transportation System Plan Update

Subject: Final Tech Memo #5: Alternatives Analysis and Funding Program

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Introduction

This memorandum summarizes the alternatives analysis and funding program for the Florence Transportation System Plan (TSP) update. This memorandum identifies potential transportation system alternatives to address the existing gaps and deficiencies and future needs identified in previous memoranda. This memorandum also identifies existing and potential future funding sources the City can use to implement the TSP. The information provided in this memorandum will serve as the basis for selecting preferred alternatives and developing plans, policies, programs, and projects for the Florence TSP update.

Street System

Streets serve a majority of trips within Florence across all travel modes. In addition to motor vehicles, pedestrians, bicyclists, and public transit riders use the street system to access local and regional destinations. This section identifies alternatives to address existing gaps and deficiencies and future needs in the street system as well as alternatives that will facilitate improvements to the pedestrian, bicycle, and public transit systems.

FUNCTIONAL CLASSIFICATION

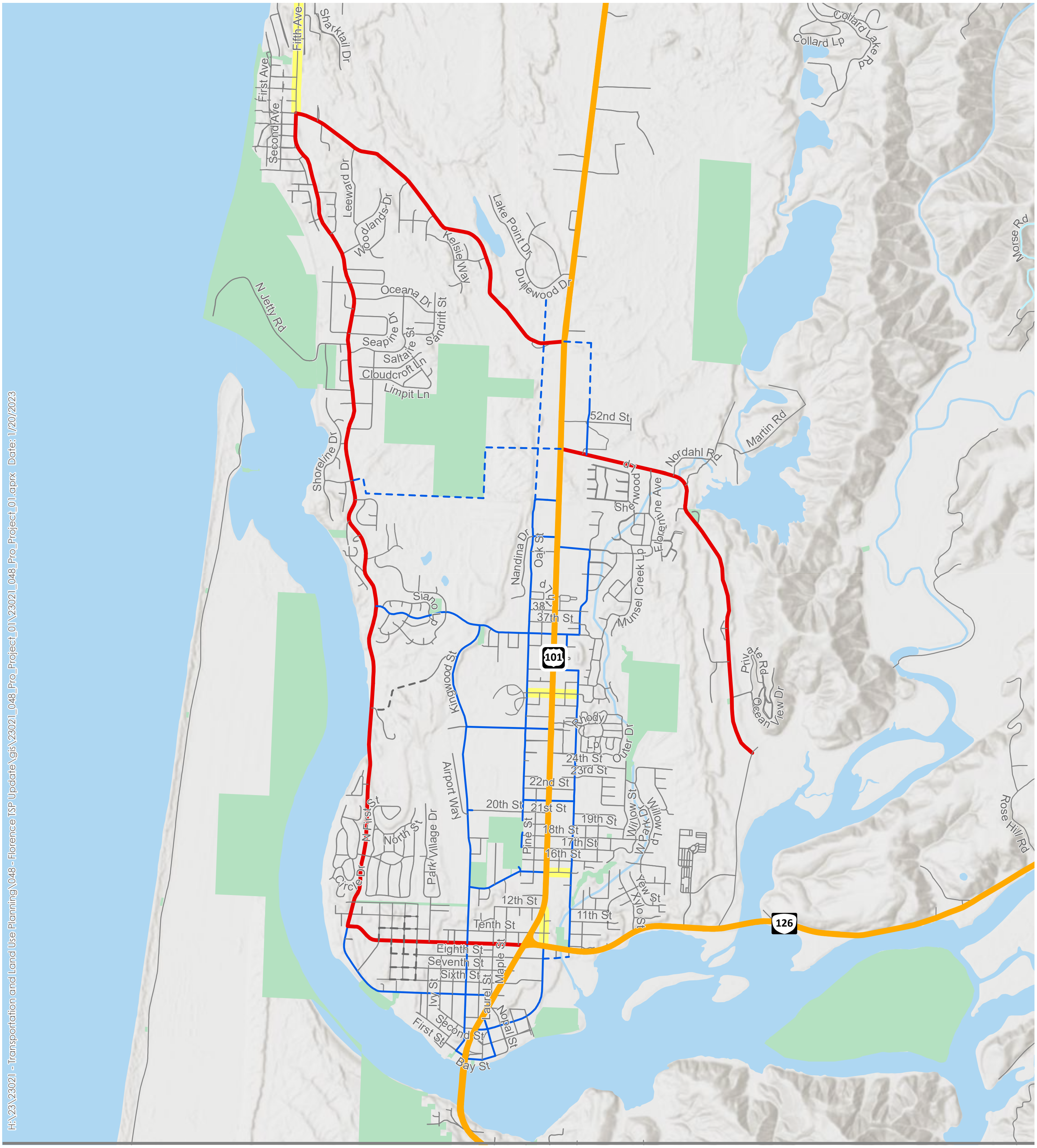
Functional classification designations align the design of a roadway with its intended function. Based on a review of the existing Florence functional classification system, there are several opportunities to better align the classifications with the intended use of the roadway as well as to better algin with state and local classifications. The functional classification opportunities are shown in Figure 1 and listed below.

- Designate 4th Ave (Heceta Beach Rd to Joshua Ln) from a local street to a collector
- Designate 15th Street (US 101 to Spruce Street) from a local street to a collector
- Designate 30th Street (Oak Street to Spruce Street) from a local street to a collector
- Designate Quince Street (OR 126 to US 101) from a local street to a collector

MAJOR STREET CONNECTIVITY

A review of the existing arterial and collector system indicates a need for new major street connections within Florence. The future street system needs to balance the benefits of providing a well-connected grid system with the connectivity challenges in the city due topographic and other natural constraints as well as existing development. Opportunities to extend existing major streets and to provide new major street connections are shown in Figure 1 and listed below. The major street extensions and connection shown in bold are identified in the current TSP.

- Extend Pacific View Drive to Rhododendron Drive
- Extend Munsel Lake Road to the Oak Street
- Extend Oak Street from Heceta Beach Road to Fred Meyers
- Extend Spruce Street to the Heceta Beach Road
- Extend Oak Street from Heceta Beach Road to the north city limits



Roads

- Highway / Major Arterial
- Minor Arterial
- Collector
- Local Street
- Functional Classification Change
- Future Collector
- Future Local Street
- Parks
- Water
- City Boundary
- Urban Growth Boundary

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Figure 1

Future Functional Classification Florence, Oregon

- Extend Heceta Beach Road to the Spruce Street
- Extend Munsel Lake Road from Oak Street to Rhododendron Drive
- Extend 20th Street to Kingwood Street

INTERSECTION OPERATIONS

The intersection operations analysis summarized in *Tech Memo #4: Future (No-build) Conditions*, identifies two intersections that are projected to exceed their applicable mobility standards or targets within the planning horizon. The queuing analysis identifies two additional intersections where vehicle queues are projected to exceed the striped storage. This section summarizes the intersection treatments and alternatives considered to address intersection operations and queueing deficiencies at the study intersections. *Attachment A contains the intersection operations analysis worksheets for the alternatives.*

Intersection Treatments

The intersection treatments considered include geometric changes and changes to existing lane configurations and traffic control.

Turn Lane

Separate left and right-turn lanes, as well as two-way left-turn lanes (TWLT), can provide significant increases in the capacity of intersections to accommodate turn movements. They can also provide a safety benefit by creating separation between slowed or stopped vehicles waiting to turn left and through vehicles. The design of turn lanes is largely determined based on a traffic study that identifies the need for the turn lane and the storage length needed to accommodate vehicle queues. Turn lanes are commonly used at intersections where the turning volumes warrant the need for separation.

Traffic Signal

Traffic signals allow opposing streams of traffic to proceed through an intersection in alternating patterns. When used, traffic signals can effectively manage high traffic volumes and provide dedicated times in which pedestrians and bicyclists can cross roadways. Because they continuously draw from a power source and must be periodically re-timed, signals typically have higher maintenance costs than other types of intersection control. Signals can also provide a safety benefit where signal warrants are met, however, they may result in an increase in rear-end crashes compared to other solutions. Signals have a significant range in costs depending on the number of approaches, how many through and turn lanes at each approach, and, if it is in an urban or rural area.

Signal Timing/Phasing Optimization

Signal timing/phasing optimization refers to updating signal timing/phasing plans to better match prevailing traffic conditions. Timing optimization can be applied to existing systems or may include upgrading signal technology, such as signal communication infrastructure, signal controllers, or cabinets. Signal timing/phasing optimization can reduce travel times and be especially beneficial to improving travel time reliability. In high pedestrian or desired pedestrian areas, signal retiming/phasing optimization can facilitate pedestrian movements through intersections by increasing minimum green times to give pedestrians time to cross during each cycle. Signals can also facilitate bicycle movements with the inclusion of bicycle detectors.

Signal Upgrade

Signal upgrades often come at a higher cost than signal timing/phasing optimization and usually require further coordination between jurisdictions. However, signal upgrades provide the opportunity to incorporate advanced signal systems to further improve the efficiency of a transportation network. Strategies include coordinated signal operations across jurisdictions, centralized control of traffic signals, adaptive or active signal control, and transit or freight signal priority. These advanced signal systems can reduce delay, travel time and the number of stops for transit, freight, and other vehicles. In addition, these systems may help reduce vehicle emissions and improve travel time reliability.

Roundabout

Roundabouts are circular intersections where entering vehicles yield to vehicles already in the circle. They are designed to slow vehicle speeds to 20 to 30 mph or less before they enter the intersection, which promotes a more comfortable environment for pedestrians, bicyclists, and other non-motorized users. Roundabouts have fewer conflict-points and have been shown to reduce the severity of crashes, as compared to signalized intersections. Roundabouts can be more costly to design and install when compared to other intersection control types, but they have a lower operating and maintenance cost than traffic signals. Topography must be carefully evaluated in considering a roundabout, given that slope characteristics at an intersection may render a roundabout infeasible.

Intersection Alternatives

The intersection alternatives are summarized in Table 1. These alternatives are intended to address intersection operations and queueing deficiencies at the study intersections. Many of these alternatives will also address safety issues described later in this memorandum. The alternatives shown in **bold** are identified in the current TSP.

Table 1: Intersection Alternatives

Intersection	Considerations	Alternatives
ODOT Intersections		
US 101/ Munsel Lake Rd	» The intersection is projected to exceed ODOT mobility targets under 2042 traffic conditions » The intersection is projected to meet MUTCD signal warrants	» **Install a traffic signal when warranted** » Reconfigure the intersection/modify the traffic control (e.g., traffic signal, roundabout)
US 101/ 35th St	» The eastbound left-turn queue is projected to exceed its available storage under 2042 traffic conditions	» Restripe the eastbound approach to maximize the available storage » Optimize the signal timing/phasing to address queuing
US 101/ 27th St	» The intersection is projected to meet ODOT mobility targets under 2042 traffic conditions » The current TSP identifies the need for a traffic signal	» Do nothing » **Install a traffic signal when warranted** » Reconfigure the intersection/modify the traffic control (e.g., traffic signal, roundabout)

US 101/ 15th St	» The intersection is projected to meet ODOT mobility targets under 2042 traffic conditions » The current TSP identifies the need for a traffic signal	» Do nothing » **Install a traffic signal when warranted** » Reconfigure the intersection/modify the traffic control (e.g., traffic signal, roundabout)
US 101/ OR 126	» The eastbound and southbound left-turn queues are projected to exceed their available storage under 2042 traffic conditions	» Restripe the eastbound and southbound approaches to maximize the available storage » Optimize the signal timing/phasing to address queuing
OR 126/ Quince Street	» The intersection is projected to meet ODOT mobility targets under 2042 traffic conditions » The current TSP identifies the need for turn movement restrictions	» Do nothing » **Implement turning movement restrictions (right-in/right-out)** » Implement turning movement restrictions (right-in/right-out/left-in) » Reconfigure the intersection/modify the traffic control (e.g., traffic signal, roundabout)
OR 126/ Spruce Street	» The intersection is projected to meet ODOT mobility targets under 2042 traffic conditions » The current TSP identifies the need for a traffic signal	» Do nothing » **Install a traffic signal when warranted** » Reconfigure the intersection/modify the traffic control (e.g., traffic signal, roundabout)
City Intersections		
9th St/ Kingwood St	» The intersection is projected to meet City mobility standards under 2042 traffic conditions » The current TSP identifies the need for a traffic signal	» Do nothing » **Install a traffic signal when warranted** » Reconfigure the intersection/modify the traffic control (e.g., all-way stop-control, traffic signal, mini roundabout)
35th/ Kingwood St	» The intersection is projected to exceed City mobility standards under 2042 traffic conditions	» Reconfigure the intersection/modify traffic control (e.g., all-way stop-control, traffic signal, mini roundabout)
35th St/Oak St	» Public input indicates that the intersection currently has congestion issues, particularly during the school peak period	» Reconfigure the intersection/modify the traffic control (e.g., all-way stop-control, traffic signal, mini roundabout)

Access Management and Spacing

The term "access management" is commonly used to describe the practice of managing the number, placement, and movements of intersections and driveways that provide access to adjacent land uses. Access management policies can be an important tool to improve transportation system efficiency by limiting the number of opportunities for turning movements on to or off of certain streets. In addition, well deployed access management strategies can help manage travel demand by improving travel conditions for pedestrian and bicycles. Eliminating the number of access points on roadways allows for continuous sidewalk and bicycle facilities and reduces the number of potential interruptions and conflict points between pedestrians, bicyclists, and cars. Access management can be extremely difficult to implement once properties have been developed along a corridor. Cooperation among and involvement of relevant government agencies, business owners, land developers and the public is necessary to establish an access management plan that benefits all roadway users and businesses.

ACCESS MANAGEMENT ALTERNATIVES

The TSP should identify access management strategies that help to preserve transportation system investments and guard against deteriorations in safety and increased congestion. The City's approach to access management should balance the need for land use activities and property parcels to be served with appropriate access while preserving safe and efficient movement of traffic. The access management alternatives considered for Florence include:

- Update the city-wide access spacing standards to include spacing between driveways,
- Define a variance process for when the standard cannot be met, and
- Establish an approach for access consolidation over time to move in the direction of the access spacing standards at each opportunity.

Access Spacing Standards

As indicated in *Tech Memo 3B: Existing Conditions Analysis*, ODOT and the City have adopted access spacing standards for study area roadways. ODOT's access spacing standards are defined in Oregon Administrative Rule (OAR) 734 Division 51 and apply to access points along US 101 and OR 126. The City's access spacing standards are defined in Title 10 of the Florence City Code. Table 1 summarizes the City's access spacing standards.

Table 2: City Access Spacing Standards

Functional Classification	Minimum Spacing Between Intersections (ft)[1]	Minimum Spacing between Intersections and Driveways (ft)[2]
Alley	N/A	15
Local Street	125	25
Collector Street	250	30
Arterial Street	250	50

As shown in Table 1, the City's access spacing standards are currently determined by functional classification and include spacing between intersections and between intersections and driveways. The standards could be updated to also include spacing between driveways. Table 2 summarizes potential modifications to the City's access spacing standards.

[1] Per Florence City Code Section 10-36-2-13: Street Alignment, Radii

[2] Per Florence City Code Section 10-35-2-7: Intersection Separation; Backing onto Public Streets

Table 3: City Access Spacing Standards

Functional Classification	Minimum Spacing Between Intersections (ft)	Minimum Spacing between Intersections and Driveways (ft)	Minimum Spacing between Driveways (ft)
Alley	N/A	15	N/A
Local Street	125	25	25
Collector Street	250	30	125
Arterial Street	250	50	125

Access Spacing Variances

Access spacing variances may be provided to parcels whose highway/street frontage, topography, or location would otherwise preclude issuance of a conforming permit and would either have no reasonable access or cannot obtain reasonable alternate access to the public road system. In such a situation, a conditional access permit may be issued by ODOT or the City, as appropriate, for a connection to a property that cannot be accessed in a manner that is consistent with the spacing standards. The permit can carry a condition that the access may be closed at such time that reasonable access becomes available to a local public street. The approval condition might also require a given landowner to work in cooperation with adjacent landowners to provide either joint access points, front and rear cross-over easements, or a rear access upon future redevelopment.

The requirements for obtaining a deviation from ODOT's minimum spacing standards are documented in OAR 734-051-3050. For streets under the City's jurisdiction, the City may reduce the access spacing standards at the discretion of the City Engineer if the following conditions exist:

- Joint access driveways and cross-over easements are provided consistent with the standards,
- The site plan incorporates a unified access and circulation system consistent with the standards,
- The landowner enters into an agreement with the City that pre-existing connections on the site will be closed and eliminated after construction of each side of the joint use driveway, and/or
- The proposed access plan for redevelopment properties moves in the direction of the standards.

The City Engineer may modify or waive the access spacing standards for streets under the City's jurisdiction where the physical site characteristics or layout of abutting properties would make development of a unified or shared access and circulation system impractical, subject to the following considerations:

- Unless modified, application of the access standard will result in the degradation of operational and safety integrity of the transportation system.
- The granting of the variance shall meet the purpose and intent of these standards and shall not be considered until every feasible option for meeting access standards is explored.

- Applicants for variance from these standards must provide proof of unique or special conditions that make strict application of the standards impractical. Applicants shall include proof that:
  - Indirect or restricted access cannot be obtained,
  - No engineering or construction solutions can be applied to mitigate the condition, and
  - No alternative access is available from a road with a lower functional classification than the primary roadway.

No variance shall be granted where such hardship is self-created. Consistency between access spacing requirements and exceptions in the TSP and the municipal code is an important regulatory solution to be addressed as part of this TSP update.

Access Consolidation

From an operational perspective, access management measures limit the number of redundant access points along roadways. This enhances roadway capacity, improves safety, and benefits circulation. Enforcement of the access spacing standards should be complemented with provision of alternative access points. Purchasing right-of-way and closing driveways without a parallel road system and/or other local access could seriously affect the viability of the impacted properties. Thus, if an access management approach is taken, alternative access should be developed to avoid "land-locking" a given property.

As part of every land use action, the City should evaluate the potential need for conditioning a given development proposal with the following items in order to maintain and/or improve traffic operations and safety along the arterial and collector roadways.

- Providing access only to the lower classification roadway when multiple roadways abut the site.
- Provision of crossover easements on all compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels.
- Issuance of conditional access permits to developments having proposed access points that do not meet the designated access spacing policy and/or can align with opposing driveways.
- Right-of-way dedications to facilitate the future planned roadway system in the vicinity of proposed developments.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) along site frontages that do not have full build-out improvements in place at the time of development.

Exhibit 1 illustrates the application of cross-over easements and conditional access permits over time to achieve access management objectives. The individual steps are described in Table 4. As illustrated in the exhibit and supporting table, by using these guidelines, all driveways along the highways/streets can eventually move in the overall direction of the access spacing standards as development and redevelopment occur.

Exhibit 1: Cross Over Easement

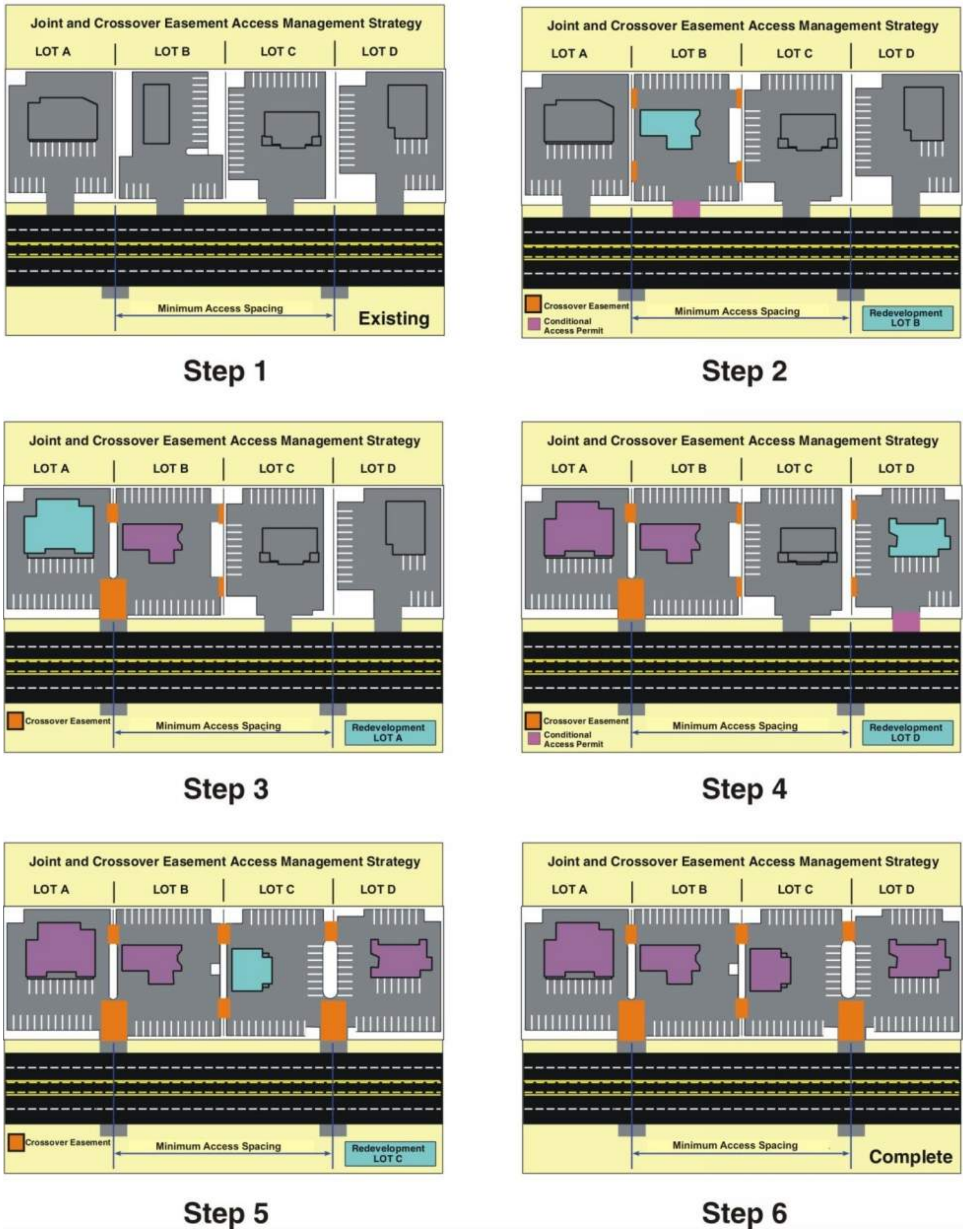


Table 4: Example of Crossover Easement/Indenture/Consolidation

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing standard nor align with driveways or access points on the opposite side of the highway. Under these conditions motorists are into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the highway
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the City would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the City would issue conditional permits for the development to provide crossover easements with Lots A and C, and ODOT/City would grant a conditional access permit to the lot. After evaluating the land use action, ODOT/City would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set forth for segment of highway.
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the City/ODOT would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario ODOT and the City would use the previously obtained cross-over easement at Lot B consolidate the access points of Lots A and B. ODOT/City would then relocate the conditional access of Lot B to align with the opposing access point and provide and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the highway, but will also eliminate the conflicting left-turn movements the highway by the alignment with the opposing access point.
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the City and ODOT will be able to eliminate another access point and provide the alignment with the opposing access points.
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the access spacing standard.

Pedestrian Connectivity

This section provides an overview of pedestrian facilities that could be implemented within Florence to improve access and circulation for pedestrians. This section also identifies the pedestrian alternatives developed to address gaps and deficiencies in pedestrian connectivity along arterial and collector streets.

PEDESTRIAN FACILITIES

Pedestrian facilities are the elements of the transportation system that enable people to walk and roll safely and efficiently between residential neighborhoods and schools, parks, recreational areas, retail/commercial centers, and transit stops. These include facilities for pedestrian movement along roadways (e.g., sidewalks, shared-use paths, and trails) and for safe roadway crossings (e.g., crosswalks, flashing beacons, pedestrian refuge islands). Each facility plays an important role in developing a comprehensive pedestrian system.

Sidewalks

Sidewalks are the primary building block of the pedestrian system. They provide an important means of mobility for walkers as well as people with disabilities, families with strollers, and others who may not be able to travel on an unimproved surface. Sidewalks are usually 6-feet wide and constructed from concrete. They are also frequently separated from the roadway by planting strips, on-street parking, and/or on-street bike lanes or other bike facilities (see below). Sidewalks are widely used in urban and suburban areas. Ideally, sidewalks could be provided on both sides of the roadway; however, some areas with physical or right-of-way constraints may require that a sidewalk be located on only one side.

Crosswalks

Crosswalks enable people to safely cross streets, railroad tracks, and other transportation facilities. Planning for appropriate crosswalks requires the community to balance vehicular mobility needs with providing crossing locations along the desired routes of pedestrians. Enhanced crosswalk treatments include geometric features such as curb extensions and raised median islands with pedestrian refuges as well as signing and striping, flashing beacons, signals, countdown heads, and leading pedestrian intervals. Many of these treatments can be applied simultaneously to further alert drivers of the presence of pedestrians in the roadway. *Attachment B contains a description of several enhanced crosswalk treatments.*

ODOT provides guidance on the types of enhanced crosswalk treatments that can be applied along ODOT facilities. Additional guidance is available from the Federal Highway Administration (FHWA) and the National Cooperative Highway Research Program (NCHRP). The guidance generally considers the physical and operational characteristics of roadways at the crosswalk location, including number of lanes, traffic volumes, travel speeds, and (in some cases) pedestrian activity. With this information, the City or ODOT can determine the most appropriate treatment for a given crossing; however, this is not typically done as part of a TSP.

Shared-use Paths and Trails

Shared-use paths and trails are improved (i.e., paved) and unimproved (i.e., dirt and gravel) facilities that serve pedestrians and bicyclists. Shared-use paths and trails can be constructed adjacent to roadways where topography, right-of-way, or other issues preclude construction of sidewalks and bike facilities on both sides (i.e., side path) or they may be constructed away from the roadway within their own right-of-way. A minimum width of 10 feet is recommended in areas with low levels of pedestrian/bicycle traffic (8-feet in constrained areas); 12 feet should be considered in areas with moderate to high levels of pedestrian/bicycle traffic. Shared-use paths and trails can be used to create long distance links within and between communities and provide regional connections. They play an integral role in recreation, commuting, and accessibility due to their appeal to users of all ages and skill levels.

Pedestrian Amenities

In addition to pedestrian facilities focused on throughput and movements, there are pedestrian amenities that can be provided to enhance the user experience. Street furniture, such as benches and garbage cans, can be provided in the public right-of-way in support of pedestrian and bike trips. In addition, amenities including street patios or parklets utilize space between the curbs that might have been previously used for another purpose such as parking.

PEDESTRIAN ALTERNATIVES

The pedestrian alternatives considered for Florence are summarized in Table 5. These alternatives are intended to address gaps and deficiencies in the existing pedestrian system as well as enhance pedestrian connectivity. The alternatives shown in **bold** are identified in the current TSP.

Table 5: Pedestrian Facility Alternatives

Roadway	Considerations	Alternatives
ODOT Streets		
US 101 37th St to UGB	» Sidewalk gaps on both sides of roadway » High level of traffic stress (sidewalk gaps, high travel speeds, 5 lanes, no buffer) » Limited crossing opportunities	» Fill sidewalk gaps at key destinations (e.g., Fred Meyer) » Complete sidewalks on both sides to Munsel Lake Rd » Complete sidewalks on both sides to Heceta Beach Rd » Complete sidewalks on both sides to the UGB » Reconstruct existing sidewalks with landscaped buffers » Install an enhanced crossing at 43rd Street
US 101 37th St to Siuslaw River Bridge	» Complete sidewalk network » High level of traffic stress (narrow sidewalks, high travel speeds, 5 lanes, no buffer) » High number of pedestrian destinations	» Reconstruct existing sidewalks with landscaped buffers » Install enhanced crossings at select locations » Install a pedestrian/bicycle bridge at select locations
OR 126 US 101 to east UGB	» Urban highway to Tamarack St, rural highway to the UGB » Sidewalk gaps on both sides of roadway » High level of traffic stress (sidewalk gaps, high travel speeds, no buffer) » Limited crossing opportunities	» Complete sidewalks on north side to casino » Complete sidewalks on both sides to Tamarack St » Reconstruct existing sidewalks with landscape strips
Lane County Streets		
Heceta Beach Rd US 101 to Rhododendron Dr	» Narrow shoulders » Evacuation route for homes in northern part of Florence » A potential alternative route for the Oregon Coast Bike Route	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct sidewalks on one side » Construct shared-use path on one side – include landscape strip as feasible
Jetty Rd Rhododendron Dr to North Jetty Beach	» Little to no shoulders » Relatively high travel speeds (not posted) » Multiple pull-outs	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct shared-use path on one side – include landscape strip as feasible

Munsel Lake Rd US 101 to Spruce Street	» Narrow shoulders » Connects to new housing developments	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct sidewalks with landscape strips on one side and a shared-use path with a bioswale on the other
Munsel Lake Rd Spruce Street to Ocean Dunes Dr	» Narrow shoulders » Connects to Munsel Lake Landing County Park	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct sidewalks on one side » Construct shared-use path on one side – include landscape strip as feasible » Install enhanced crossings at select locations
Munsel Lake Rd Ocean Dunes Dr to N Fork Siuslaw Rd	» Limited paved shoulder, but often large gravel shoulder » Residential driveways along entire segment	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct sidewalks on one side » Construct shared-use path on one side – include landscape strip as feasible
N Fork Siuslaw Rd OR 126 to Munsel Lake Rd	» Narrow shoulders » Provides access to casino	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct sidewalks on one side » Construct shared-use path on one side – include landscape strip as feasible
City Streets - Arterial		
9th St US 101 to Rhododendron Dr	» Existing sidewalks along both sides of entire segment » Low level of traffic stress » Several major destinations (hospital, library, police)	» Do nothing » Install enhanced crossing treatments at existing crosswalks
Rhododendron Dr US 101 to Hemlock St	» Existing sidewalks along both sides of entire segment » Low level of traffic stress » A potential alternative route for the Oregon Coast Bike Route	» Do nothing » Install enhanced crossing treatments at existing crosswalks
Rhododendron Dr Hemlock Street to 9th St	» New sidewalk construction on north/east side of roadway » A potential alternative route for the Oregon Coast Bike Route	» Construct sidewalks on the south/west side » Install enhanced crossings at select locations (e.g., Exploding Whale Memorial Park)
Rhododendron Dr 9th St to Wild Winds St	» Striped bike lanes on both sides » A potential route for the Oregon Coast Bike Route	» Reconfigure bike lanes as mixed-use shoulders » Construct shared-use path on one side – include landscape strip as feasible

Rhododendron Dr Wild Winds St to 35th St	» Narrow shoulders on both sides » Primarily next to the Siuslaw River – limited areas to expand right-of-way » Few homes or destinations along this segment » A potential route for the Oregon Coast Bike Route	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct shared-use path on one side – include landscape strip as feasible
Rhododendron Dr 35th Street to Heceta Beach Rd	» Narrow shoulders on both sides » More residential segment of roadway » A potential route for the Oregon Coast Bike Route	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct shared-use path on one side – include landscape strip as feasible
City Streets - Collector		
2nd St US 101 to Harbor St	» Sidewalk gaps and narrow sidewalks on both sides » Enhanced crosswalk at US 101/2nd St » Connects US 101 and OR 126 via Quince St	» **Fill sidewalk gaps within Old Town** » Reconstruct existing sidewalks with landscape strips » Install enhanced crossings at Nopal St, Oak St, Harbor St (e.g., marked crosswalks with curb extensions)
21st St **Oak St to US 101**	» Signalized crosswalk at US 101 » Direct access to Siuslaw Elementary School	» Retime signal at US 101 for improved pedestrian access (e.g., leading pedestrian interval)
21st St US 101 to Spruce St	» Sidewalk gaps on both sides » Direct access to Grocery Outlet » Major transit stop at Grocery Outlet » Moderate level of traffic stress east of US 101 (lack of existing sidewalks)	» Fill sidewalk gaps on both sides
27th St US 101 to Kingwood St	» Sidewalk gaps on both sides » Direct access to Siuslaw Middle and High schools » Shared-use path east of US 101 connects to Spruce St	» Fill side sidewalk gaps between US 101 and Oak St » Install enhanced crossing at US 101
35th St Rhododendron Dr to Kingwood St	» No sidewalks on either side » Important connection between Rhododendron Dr and US 101	» Construct sidewalks on one side » Construct sidewalks on both sides » Construct shared-use path on one side – include landscape strip as feasible » Install an enhanced crossing at Kingwood St
35th St Kingwood St to Oak St	» Sidewalk gaps on both sides » Primarily undeveloped property on north side » Important connection between Rhododendron Dr and US 101	» Fill in sidewalk gaps on one side » Fill in sidewalk gaps on both sides » Construct shared-use path on one side – include landscape strip as feasible

35th St Oak St to US 101	» Sidewalk gaps on both sides » Signalized crosswalk at US 101	» Fill in sidewalk gaps on both sides » Retime signal at US 101 for improved pedestrian access (e.g., leading pedestrian interval)
35th St US 101 to Spruce St	» Missing sidewalk sections east of Spruce St » Includes one of few signalized crosswalks on US 101	» Do Nothing
42nd St US 101 to Spruce St	» No sidewalks on either side » Northern-most connection to Spruce St from US 101 » Private road east of Munsel Creek Dr limits residential mobility	» Construct sidewalks on both sides » Install enhanced crossing on US 101 at 42nd St or between 42nd St and 43rd St » Create pedestrian connection between Munsel Creek Dr and Munsel Creek Lp
43rd St Oak St to US 101	» Sidewalks gaps on both sides » Connects Oak St to US 101 – next closest is 46th to the north	» Fill in sidewalk gaps on south sides
46th St Oak St to US 101	» Complete sidewalk on both sides » Connects Oak St to US 101 – next closest is 43rd to the south » Access to Fred Meyer	» Do nothing » Install enhanced crossing on US 101 at 46th St
Airport Rd/15th St Kingwood St to US 101	» Sidewalk gaps on both sides » Connects to Kingwood St to US 101 – next closest is 10th to the south » Enhanced crossing on US 101 north of 15th St	» Fill in sidewalk gaps on both sides
Bay St Kingwood St to Maple St	» Complete sidewalks on both sides » High level of traffic stress (narrow sidewalk width, no buffer)	» Reconstruct sidewalks to increase width » Install curb extensions at Kingwood St, Laurel St, Maple St, and mid-block by the boardwalk » **Install mid-block crosswalk at Bay St/ Nopal St corner by the boardwalk** » Develop a streetscape design plan
Kingwood St Bay St to 9th St	» Sidewalk gaps on both sides » Connections to residential land and to downtown Florence	» **Fill in sidewalk gaps on both sides** » Install enhanced crossing at Bay St
Kingwood St 9th Street to Airport Way	» Sidewalk gaps on both sides » Segment serves a wide variety of land uses	» **Fill in sidewalk gaps on both sides** » Install enhanced crossings at select locations

Kingwood St Airport Way to 20th St	» Sidewalk gaps on both sides » Segment serves a wide variety of land uses	» **Fill in sidewalk gaps on both sides** » Install enhanced crossings at select locations
Kingwood St 20th St to 35th St	» Complete sidewalks on both sides » High level of traffic stress (high speeds) » Some physical buffering, but not consistent	» Reconstruct sidewalks with landscape strips » Implement traffic calming measures
Maple St US 101 to Bay St	» Sidewalk gaps on one side » Connects US 101 with downtown Florence	» Fill in sidewalk gaps on one side
Oak St 20th St to 27th St	» Complete sidewalks on both sides » Serves Siuslaw Elementary and Middle schools, and Miller Park	» Install enhanced crossings at select location
Oak St 27th St to 35th St	» Sidewalk gaps on one side » Serves Siuslaw High School and Lane Community College	» **Fill in sidewalk gaps on one side** » Install enhanced crossings at select location
Oak St 35th St to 46th St	» Sidewalk gaps on one side » Land use mix includes residential and industrial land » Moderate level of traffic stress	» Fill in sidewalk gaps on one side » Reconstruct sidewalks with landscape strips » Implement traffic calming measures
Quince St 2nd St to OR 126	» Complete sidewalk network » Important connection from downtown to OR 126 » Florence Events Center is on the west side of Quince St	» Install enhanced crossing at 6th St for events center access
32nd-Redwood St Spruce St to 35th St	» Sidewalk gaps on south/west side » Extension of Spruce St in northern Florence	» Fill in sidewalk gap on south/west side
Spruce St 42nd St to 35th St	» Sidewalk gaps on both sides » Major north-south roadway in northern Florence	» Fill sidewalks gaps on both sides
Spruce St 32nd St to 17th St	» Complete sidewalk network » Major north-south roadway next to US 101 » Connections to two shared-use paths	» Install enhanced crossings at shared-use paths
Spruce St 17th St to OR 126	» Sidewalk gaps on both sides » Major north-south road connecting to OR 126	» Fill sidewalks gaps on both sides

Spruce St Munsel Lake Road to northern Terminus	» New roadway with sidewalks on one side	» Do nothing » Construct sidewalks on the west side
City Streets – Other Streets of Significance		
4th Ave Heceta Beach Rd to Joshua Lane	» No sidewalks or paved shoulder » Extension of Rhododendron Dr, north of Heceta Beach Rd » Serves greater Heceta Beach area in northern Florence	» Construct mixed-use shoulders on both sides » Construct sidewalks on one side » Construct shared-use path on one side – include landscape strip as feasible
20th St Kingwood St to US 101	» No sidewalks on 20th St except short segment near US 101 » Important connect to public schools, Miller Park, Grocery Outlet » Unpaved shared-use path connection to Kingwood St	» Construct sidewalks on both sides » Install enhanced crossing at US 101 » Extend 20th St west to Kingwood St
Laurel St-Old Town Wy US 101 to Maple St	» Sidewalk gaps on Laurel St and Old Town Wy » Streets run through downtown Florence and connect to US 101	» **Fill sidewalk gaps on both sides**
30th St Oak St to US 101	» Complete sidewalks on both sides » Direct access to Siuslaw High School » Existing enhanced crosswalk at US 101 and Oak St	» Do nothing » Install second crosswalk at Oak St and install school crosswalk signs
30th St US 101 to Spruce St	» Complete sidewalk on both sides » Near the Oregon Department of Human Services office	» Do nothing

Table 5 identifies several shared-use path alternatives along existing City, County, and ODOT facilities. The following summarizes additional shared-use path alternatives.

- Munsel Creek Shared-use Path – Install and/or improve the segments of the Munsel Creek Trail between Quince Street and 16th Street and between 25th Street and 29th Street. Extend the path from the Munsel Lake Greenway to Munsel Lake Road.
- Estuary Trail – Install a shared-use path from the Boardwalk in Old Town to south end of Munsel Creek Trail.
- 12th Street Shared-use Path – Install and/or improve the existing path between Kingwood Street and Rhododendron Drive.
- Oak Street Shared-use Path – Install a shared-use path from Oak Street at 15th Street to 10th Street.
- Ivy Street Shared-use Path – Install a shared-use path from 12th Street to 8th Street.

- Elm Street Shared-use Path – Install a shared-use path in the existing Elm Street right-of-way between 8th Street and Rhododendron Drive.
- Driftwood Street Shared-use Path – Install a shared-use path in the existing Driftwood Street right-of-way between 12th Street and 11th Street.
- North Florence County Park Shared-use Path – Install a network of shared-use paths within the County Park in the North Florence area.
- Oceana Drive Shared-use Path – Install a shared-use path from the eastern terminus of Oceana Drive to the southern Terminus of Kelsie Way.

Bicycle Connectivity

This section provides an overview of bicycle facilities that could be implemented within Florence to improve access and circulation for bicyclists. This section also identifies the bicycle alternatives developed to address gaps and deficiencies in bicycle connectivity along arterial and collector streets.

BICYCLE FACILITIES

Bicycle facilities are the elements of the transportation system that enable people to travel safely and efficiently between residential neighborhoods and destinations in the city and the surrounding area by bike. These include facilities for bicycle movement along key roadways (e.g., shared lane pavement markings, on-street bike lanes, buffered bike lanes, and separated bike lanes) and facilities at key crossing locations (e.g., enhanced bike crossings). These also include end of trip facilities (e.g., bike parking, bike hubs, tune-up stations, changing rooms, and showers at worksites); however, most of these facilities are addressed through the development code. Each facility plays an important role in developing a comprehensive bicycle system.

Mixed-use Shoulders

A mixed-use shoulder is a roadway shoulder that is wide enough to be used by pedestrians and bicyclists as a mixed-use path. Mixed-use shoulders are ideal on low-volume streets where topography or the surrounding environment does not allow for the addition of a sidewalk or separate bicycle facility.

Low-Traffic Bikeway

Low-traffic bikeways, also known as "bicycle boulevards," are streets with low vehicular volumes and speeds that can be optimized for bicycle travel by including treatments for traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. Bike boulevards are ideal on local streets that parallel larger, high traffic routes and provide connections to similar destinations.

Shared Lane Pavement Markings

Shared lane pavement markings (often called "sharrows") are used to indicate a shared space for cyclists and motorists and are typically centered in the roadway, or approximately four feet from the edge of the travel lane, and spaced approximately 50 to 250-feet apart depending on the traffic volumes and travel speeds. Sharrows are suitable on roadways with relatively low traffic volumes (<2,500 Average Daily Traffic [ADT]) and low travel speeds (<25 MPH); however, they may also be used to transition between discontinuous bicycle facilities along roadways with higher volumes and speeds.

On-Street Bike Lanes

On-street bike lanes provide a dedicated space for the exclusive use of cyclists on the roadway surface. They are usually 5 to 6-feet wide and include an 8-inch stripe along the roadway and bike symbols at intersections; they may also include a buffer as indicated below. On-street bike lanes are typically placed at the outer edge of the roadway surface but to the inside of right-turn lanes and/or on-street parking. On-street bike lanes can improve safety and security of cyclists and (if comprehensive) can provide direct connections between origins and destinations.

Buffered Bike Lanes

Buffered bike lanes are enhanced versions of on-street bike lanes that include an additional striped buffer of typically 2-3 feet between the bike lane and the vehicle travel lane and/or between the bike lane and the vehicle parking lane. They are typically located along streets that require a higher level of separation to improve the comfort of bicycling.

Separated Bike Lanes

Separated bike lanes (often called "cycle tracks") are bike lanes that are physically separated from motor vehicle traffic by a vertical element such as a planter, flexible post, parked car, or a mountable curb. One-way separated bike lanes are typically found on each side of the street, like conventional bike lanes, while two-way separated bike lanes are typically found on one side of the street.

Bicycle Crossings

Bicycle crossings enable cyclists to travel safely through intersections and across streets, railroad tracks, and other transportation facilities. Planning for appropriate bicycle crossings requires the community to balance vehicular mobility needs with providing crossing locations along the desired routes of cyclists. Enhanced bicycle crossing treatments include pavement markings through conflict areas, bike boxes, two-stage left-turn bike boxes, bike only signals, and bicycle detection

Wayfinding Signs

Wayfinding signs are physical signs or travel lane markings located along roadways or at intersections that direct cyclists between destinations along low-stress and comfortable bicycle routes. Wayfinding signs help inexperienced and/or less confident cyclists overcome perceived barriers by identifying lower speed and lower volume routes that do not require a bicycle facility. They typically include distances and average walk/cycle times. Wayfinding signs are generally used along bicycle routes and shared-use paths.

Bicycle Parking

Bicycle parking is a vital component of a city's bicycle system and can be provided in a variety of sizes, shapes, and unique pieces of infrastructure that resemble the city's character. Bicycle parking can generally be categorized into two types: short-term and long-term.

- **Short-term bicycle parking** is designed to meet the needs of cyclists visiting businesses, institutions, and other destinations where visits typically last up to two hours. Short-term bicycle parking must be readily accessible, visible, and self-explanatory.

- **Long-term bicycle parking** places an emphasis on security and weather protection and is designed to meet the needs of cyclists who may leave their bicycle unattended for several hours or more. Long-term bicycle parking is typically located at residences or apartment buildings, workplaces, transit centers, and other routinely visited destinations.

Bike Corral

This treatment coverts vehicle parallel parking stalls into bicycle parking. These facilities can be installed on segments or near intersections. If installed near an intersection, it can be an effective alternative to vehicle parking which can cause sight distance hazards. Bike corrals are often designed to hold approximately 12-24 bikes and have been shown to have a positive impact on business.

Bike Sharing

Bicycle sharing has been growing rapidly in recent years along with the overall trend of micro mobility. Bike sharing in particular can be a key component in the public transit system while utilizing the bicycle infrastructure of the city. The strategic location of stations can highlight key destinations around the city and be an important asset to tourists and visitors seeking to experience the city without using a vehicle.

BICYCLE ALTERNATIVES

The bicycle alternatives considered for Florence are summarized in Table 6. These alternatives are intended to address gaps and deficiencies in the existing bicycle system as well as enhanced bicycle connectivity. The alternatives shown in **bold** are identified in the current TSP.

Table 6: Bicycle Facility Alternatives

Roadway	Considerations	Alternatives
	ODOT Streets	
US 101 UGB to 32nd St	» On-street bike lanes » High levels of traffic stress (posted speed, number of lanes) » 40+ MPH speed limit	» Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct separated bike lanes on one or two sides » Provide pavement markings through conflict areas (e.g., Fred Meyer Dwy, 46th St) » Provide protected intersection treatment at signalized intersections
US 101 32nd St to 22nd St	» On-street bike lanes » High level of traffic stress (posted speed, number of lanes) » 35 MPH speed limit	» Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct separated bike lanes on one or two sides » Provide protected intersection treatment at signalized intersections
US 101 22nd St to Siuslaw River Bridge	» On-street bike lanes » Moderate level of traffic stress (number of lanes, existing facilities)	» Construct buffered bike lanes on both sides – requires narrowing travel lanes

	» 30 MPH speed limit	» Construct separated bike lanes on one or two sides » Provide protected intersection treatments at signalized intersections
OR 126 US 101 to Tamarack St	» On-street bike lanes » Moderate level of traffic stress (posted speed, existing facilities) » 35 MPH speed limit	» Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct separated bike lanes on one or two sides
OR 126 Tamarack St to UGB	» Shoulder bike lanes » Moderate level of traffic stress (posted speed, existing facilities) » 45+ MPH speed limit	» Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct separated bike lanes on one or two sides
Lane County Streets		
Heceta Beach Rd US 101 to Rhododendron Dr	» Minimal paved shoulder » High level of traffic stress (posted speed, no existing infrastructure) » 40 MPH speed limit » A potential alternative route for the Oregon Coast Bike Route	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » **Construct bike lanes on both sides** » Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct shared-use path on one side – include landscape strip as feasible
Jetty Rd Rhododendron Dr to North Jetty Beach	» Little to no shoulders » Relatively high travel speeds (not posted) » Multiple pull-outs	» Widen shoulders on both sides/ reconfigure as mixed-use shoulders » Construct shared-use path on one side – include landscape strip as feasible
Munsel Lake Rd US 101 to Spruce St	» Minimal paved shoulder » Moderate level of traffic stress (posted speed, no existing infrastructure) » 35 MPH speed limit	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » Construct bike lanes on one side and shared-use path on the other – include landscape strip as feasible » Install wayfinding signs to nearby parks and trails
Munsel Lake Rd Spruce St Ocean Dunes Dr	» Minimal paved shoulder » Moderate level of traffic stress (posted speed, no existing infrastructure) » 35 MPH speed limit	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct shared-use path on one side – include landscape strip as feasible
Munsel Lake Rd Ocean Dunes Dr to N Fork Siuslaw Rd	» Minimal paved shoulder » Moderate level of traffic stress (no existing infrastructure) » 25 MPH speed limit	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » Construct bike lanes on both sides

		» Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct shared-use path on one side – include landscape strip as feasible
N Fork Siuslaw Rd OR 126 to Munsel Lake Rd	» Minimal paved shoulder » Low level of traffic stress	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » Construct bike lanes on both sides » Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct shared-use path on one side – include landscape strip as feasible
City Streets – Arterial		
9th St US 101 to Rhododendron Dr	» Bike lanes on both sides » Low level of traffic stress » 25 MPH speed limit	» Do nothing » Construct buffered bike lanes on both sides – requires narrowing travel lanes
Rhododendron Dr US 101 to 9th St	» Bike lanes on both sides » Low level of traffic stress » 30 MPH speed limit » A potential route for the Oregon Coast Bike Route	» Do nothing » Construct buffered bike lanes on both sides – requires narrowing travel lanes
Rhododendron Dr 9th St to Wild Winds St	» Bike lanes on both sides » Low level of traffic stress » 30 MPH speed limit » A potential route for the Oregon Coast Bike Route	» Construct buffered bike lanes on both sides – requires narrowing travel lanes » Construct shared-use path on one side – include landscape strip as feasible
Rhododendron Dr Wild Winds St to 35th St	» Minimal paved shoulder » High level of traffic stress (posted speed, no existing infrastructure) » 40 MPH speed limit » A potential route for the Oregon Coast Bike Route	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » Construct shared-use path on one side – include landscape strip as feasible
Rhododendron Dr 35th St to Heceta Beach Rd	» Minimal paved shoulder » High level of traffic stress (posted speed, no existing infrastructure) » 40 MPH speed limit » A potential route for the Oregon Coast Bike Route	» Widen shoulders on both sides/ reconfigure as mixed-use shoulder » Construct shared-use path on one side – include landscape strip as feasible

City Streets - Collector		
2nd St US 101 to Harbor St	» Shared lane pavement markings exist from Maple St to the east » Approximately 20-foot lanes (including on-street parking)	» Do nothing » **Add shared lane pavement markings**
21st St Oak St to US 101	» No existing bike infrastructure » Approximately 20-foot travel lanes (including on-street parking) » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings
21st St US 101 to Spruce St	» No existing bike infrastructure » Approximately 20-foot travel lanes (including on-street parking) » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings
27th St US 101 to Kingwood St	» Bike lanes on both sides from Oak St to Kingwood St » Narrow right-of-way east of Oak St » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings from Oak St to US 101 » Construct bike lanes from Oak St to US 101 – requires widening
35th St Rhododendron Dr to Kingwood St	» Bike lanes on both sides » Low level of bicycle traffic stress	» Do nothing » Implement traffic calming measures
35th St Kingwood St to Oak St	» Bike lanes on both sides » Low level of bicycle traffic stress	» Do nothing » Implement traffic calming measures
35th St Oak St to US 101	» Bike lanes on both sides » Low level of bicycle traffic stress	» Do nothing » Implement traffic calming measures
35th St Oak St to Spruce St	» Narrow bike lanes on both sides » Low level of bicycle traffic stress	» Do nothing » Widen bike lanes
42nd St US 101 to Spruce St	» Bike lanes on both sides » Private road east of Munsel Creek Dr limits residential mobility » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings east of Spruce St » Create bike connection between Munsel Creek Dr and Munsel Creek Lp
43rd St Oak St to US 101	» No existing bike infrastructure » Low level of bicycle traffic stress	» Add shared lane pavement markings » Construct bike lanes on both sides – requires removing on-street parking
46th St Oak St to US 101	» Bike lanes on both sides	» Do nothing
Airport Rd/15th St Kingwood St to US 101	» No existing bike infrastructure » Low level of bicycle traffic stress	» Add shared lane pavement markings » Construct bike lanes on both sides – requires removing on-street parking

		» Incorporate enhanced bicycle crossing at US 101 into existing crossing
Bay St Kingwood St to Maple St	» No existing bike infrastructure » Low level of bicycle traffic stress » Commercial center of Florence with lots of pedestrians » Public input seeks to improve walking and biking experience	» Do nothing » Add shared lane pavement markings
Kingwood St Bay St to 9th St	» Shared lane pavement markings » Moderate level of traffic stress	» Do nothing » Implement traffic calming measures » **Add shared lane pavement markings** » Construct bike lanes on both sides – requires removing on-street parking
Kingwood St 9th St to Airport Wy	» Bike lanes on both sides from 10th St to the north » Low level of bicycle traffic stress	» Construct bike lanes on both sides from 9th St to 10th St – requires removing on-street parking
Kingwood St Airport Wy to 35th St	» Bike lanes on both sides » 40 MPH speed limit » Moderate level of traffic stress (posted speed)	» Do nothing » Implement traffic calming measures » Construct buffer bike lanes on both sides – requires narrowing travel lanes
Maple St US 101 to Bay St	» No existing bike infrastructure » Connects US 101 with downtown Florence	» Do nothing » Add shared lane pavement markings
Oak St 20th St to 27th St	» Bike lanes from Siuslaw Middle School Dwy to 27th St » Serves Siuslaw Elementary and Middle schools, and Miller Park	» Shared lane pavement marking from 20th St to Siuslaw Middle School Dwy » **Construct bike lanes from 20th St to Siuslaw Middle School Dwy – requires removing on-street parking**
Oak St 27th St to 35th St	» Bike lanes on both sides » Serves Siuslaw High School and Lane Community College	» Do nothing » Construct buffered bike lanes – requires narrowing travel lanes
Oak St 35th St to 46th St	» Bike lanes on both sides » Speed increases to 25 and 30 MPH north of 35th St	» Do nothing » Construct buffered bike lanes – requires narrowing travel lanes
Quince St 2nd St to OR 126	» Shared lane pavement markings » Connects OR 126 to downtown without needing to use US 101 » Low level of bicycle traffic stress	» Do nothing » Construct bike lanes – requires removing on-street parking
32nd-Redwood St Spruce St to 35th St	» Bike lanes on both sides » Key connection between Spruce St from 32nd St to 35th St	» Do nothing » Construct buffered bike lanes – requires narrowing travel lanes

Spruce St 42nd St to 35th St	» Bike lanes from 35th St to 37th St » No existing infrastructure north of 37th St » Major north-south road east of US 101	» **Add shared lane pavement markings north of 37th St** » Extend bike lanes north to 42nd St
Spruce St 32nd St to 17th St	» Bike lanes on both sides from 32nd St to 25th St » Shared lane pavement markings south of 25th St » Moderate level of traffic stress » Major north-south road east of US 101	» **Construct bike lanes south of 25th St – requires removing on-street parking**
Spruce St 17th St to OR 126	» Shared lane pavement markings » Moderate level of traffic stress » Major north-south road east of US 101	» **Construct bike lanes on both sides – requires removing on-street parking**
City Streets – Other Roads of Interest		
4th Ave Heceta Beach Rd to Falcon St	» No shoulder and narrow pavement width » Extension of Rhododendron Dr, north of Heceta Beach Rd » Serves greater Heceta Beach area in northern Florence	» Add shared lane pavement markings » Construct mixed-use shoulders on both sides » Construct bike lanes on both sides » Construct shared-use path on one side – include landscape strip as feasible
20th St Kingwood St to US 101	» No existing bike infrastructure » Important connection to public schools, Miller Park, Grocery Outlet » Unpaved shared-use path connection to Kingwood St	» Add shared lane pavement markings » Extend 20th St west to Kingwood St
Laurel St-Old Town Wy US 101 to Maple St	» No existing bike infrastructure » Streets run through downtown Florence and connect to US 101	» Do nothing » Add shared lane pavement markings
30th St Oak St to US 101	» No existing bike infrastructure » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings » Construct bike lanes on both sides – requires removing on-street parking
30th St US 101 to Spruce St	» No existing bike infrastructure » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings » Construct bike lanes on both sides – requires removing on-street parking
Park Dr//18th St/ Willow Lp/Willow St	» No existing bike infrastructure » Low level of bicycle traffic stress	» Do nothing » Add shared lane pavement markings

Transit

This section provides an overview of transit facilities and services that could be implemented within Florence to improve access and circulation by transit. This section also identifies the transit alternatives developed to address gaps and deficiencies in transit connectivity.

TRANSIT FACILITIES AND SERVICES

Public transit provides important connections to destinations for people that do not drive or bike and can provide an additional option for all transportation system users for certain trips. Public transit can complement walking, bicycling, or driving trips: users can walk/roll to and from transit stops and their homes, shopping, or workplaces; people can drive to park-and-ride locations to access a bus; or people can bring their bicycles on transit vehicles and bicycle from a transit stop to their final destination.

There are two types of transit service in Florence. First, the City operates two Rhody Express routes that provide fixed-route service in southern Florence and along the US 101 corridor to the north. The Rhody Express also provides dial-a-ride service for people who live within three-quarters of a mile of fixed-route service and have a disability that prevents them from riding the bus. Second, there are intercity transit routes (operated by Link Lane and by Coos County Area Transit) that connect Florence to Yachats, Eugene, and Coos Bay.

Fixed-Route Service

Fixed-route service refers to transit service that runs on regular, scheduled routes, with designated transit stops. Fixed-route service is typically characterized by service frequency (the time between arrivals), service hours (the number of hours service is provided throughout the day), and service coverage (the amount of the population, households, and jobs served by transit).

Transit Stops

Transit stops are designated locations where residents can access local transit service. Transit stops are normally located at major destinations and at key intersections. The types of amenities provided at each transit stop (e.g., pole, bench, shelter, ridership information, trash receptacles) tend to reflect the level of usage.

- **Pole and bus stop sign** – All bus stops require a pole and bus stop sign to identify the bus stop location. Some transit agencies prefer the bus stop signs to be provided on a separate dedicated pole instead of on an existing utility pole, column, or other location.
- **Bus stop shelters** – Shelters are typically provided at higher volume stops but may be considered at stops with fewer daily boardings if served by routes with long headways.
- **Seating** – Seating should always be considered as long as it is accessible and the safety and accessibility of the adjacent sidewalk are not compromised by seating placement.
- **Trash receptacles** – While trash cans can be considered at any stop, they are usually located at stops with shelters and/or seating. Trash cans will require regular pick-up.
- **Lighting** – Lighting is an important amenity for bus stops as it provides visibility and increased security for transit users waiting, boarding, and aligning transit service.

- **ADA accessibility** – Bus stops should be accessible for users with all ranges of abilities, including a concrete landing pad, adjacent parking restrictions, and ADA-compliant pedestrian ramps.
- **Real-time bus arrival reader boards** – Bus stops with several different routes can include an electronic arrival board showing when the next bus on each route is scheduled to arrive in real-time.
- **Bicycle parking, storage, and/or repair stations** – Bicycle amenities located at bus stops further support multi-modal trips, allowing travelers to store their bicycles at one end of their trip or even repair their bicycle enroute as needed.

Park-and-Rides

Park-and-rides provide parking for people who wish to transfer from their personal vehicle to public transportation or carpools/vanpools. Park-and-rides are frequently located near major intersections, at commercial centers, or intercity bus routes. It is Oregon state policy to encourage the development and use of park-and-rides at appropriate urban and rural locations adjacent to or within the highway right-of-way.

Park-and-rides may be either shared-use, such as at a school or shopping center, or exclusive-use. Shared-use facilities are generally designated and maintained through agreements reached between the local public transit agency or rideshare program operator and the property owner. Shared-use lots can save the expense of building a new parking lot, increase the utilization of existing spaces, and avoid utilization of developable land for surface parking. In the case of shopping centers, the presence of a shared-use park-and-ride has frequently been shown to be mutually beneficial for the businesses in the center.

Mobility Hubs

Mobility hubs focus on the connectivity of public transit to a variety of travel modes, supporting non-single-occupancy-vehicle trips and helping to connect people to the different modes they need. Although mobility hubs support a transit stop or station, all services and amenities do not need to be provided immediately adjacent to the stop as long as they are still within an easily accessible area. Shared mobility services such as bikeshare, carshare, e-scooters, and on-demand rideshare zones are all located within the hub, in addition to amenities such as transit waiting areas, pedestrian and bicycle facilities, bicycle parking, bicycle repair stations, and electric vehicle charging. Additional information on the mobility hubs is provided under the Emerging Technology section.

Real-Time Transit Information

Transit agencies or third-party sources can disseminate both schedule and system performance information to travelers through in-vehicle, wayside, or in-terminal dynamic message signs, as well as on the internet or wireless devices. Coordination with regional or multimodal traveler information efforts can increase the availability of this transit schedule and system performance information. These systems enhance passenger convenience and encourage travelers to consider transit instead of driving alone. They do require cooperation and integration between agencies for disseminating the information.

TRANSIT ALTERNATIVES

Table 7 summarizes the alternatives developed to address the gaps and deficiencies in the transit facilities and services provided in Florence.

Table 7: Transit Facility Alternatives

Transit Facilities and Services	Considerations	Alternatives
New Routes and Existing Route Changes	» Public comment has been supportive of adding transit service along Rhododendron Dr (north of 35th St), to Driftwood Shores Resort, along Heceta Beach Rd, and at the US 101/Munsel Lake Rd intersection. » The South Loop and North Loop operate on a combined one-hour headway, so extending one of the loop routes would alter the existing schedule and blocking.	» Explore adding service to Rhododendron Dr » Explore adding service to the Heceta Beach neighborhood
Service Frequency, Hours, and Coverage	» Link Lane is creating a Transit Development Plan to understand the transit needs between coastal communities and between these coastal communities and Eugene. While this plan has yet to develop project alternatives, the project has discovered a need to increase intercity service. As alternatives are developed for this project, they will be incorporated into the Florence TSP Update.	» Increased intercity service frequency » Service to Eugene Airport » Service to North Bend Municipal Airport
Marketing	» Link Lane launched its Florence to Yachats route in September 2018 as a pilot , and the Eugene to Florence route launched in February 2020 as a pilot, as well. » Given the uncertain nature of the routes due to funding and to the COVID-19 pandemic, there is a need to market these routes now that the worst of the pandemic appears to be over and funding is more secure.	» Improve marketing for intercity services (specifically to Eugene and Yachats)
New Amenities	» Multiple public comments sought to establish a transit center in Florence. The Grocery Outlet at US 101/21st St, is a commonly-identified location.	» Establish a transit center at the Grocery Outlet bus stop on 21st St » Add bathroom facilities to transit center

	» Several commenters also wanted to see additional services at a future transit center, including bathroom facilities for people waiting. » Establishing a transit center could be partnered with creating a shared park-and-ride at the Grocery Outlet or at any other location where a transit center may be located.	» Formally establish a shared park-and-ride with Grocery Outlet » Add transit shelters and/or benches to existing bus stops
Transit Stops	» Most transit stops within the city do not have a shelter or a bench. Adding these would make the ridership experience more comfortable for people who are waiting for the bus.	» Add shelters and/or benches to existing bus stops » As new service is added, build bus stops that are accessible
Potential Park and Ride Locations	» A park and ride could be valuable both for trips within Florence for those not wanting to drive on US 101, OR 126, or in downtown Florence » A park and ride could also be valuable as a meeting point for service between cities (to Yachats, Eugene, or Coos Bay)	» Explore establishing a park-and-ride at the Grocery Outlet at US 101/21st St » Explore establishing a park-and-ride at the Three Rivers Casino » Explore establishing a park-and-ride at the Florence Events Center (parking lot south of 6th St)
Potential Mobility Hub Locations	» As a first step in the formation of mobility hubs, Florence should identify one primary as well as one secondary mobility hub. The primary will be the priority for transportation infrastructure in the City of Florence and the secondary will be developed when funding already satisfies the needs of the primary. » Mobility hubs are most effective next to transit stops where other mobility options (bikeshare, carshare, scooters, etc.) are available.	» Explore establishing a primary mobility hub at the Grocery Outlet at US 101/21st St » Explore establishing a secondary mobility hub at the Port parking lot (1st St and Nopal St) » Explore establishing a secondary mobility hub at the Florence Events Center (parking lot south of 6th St)

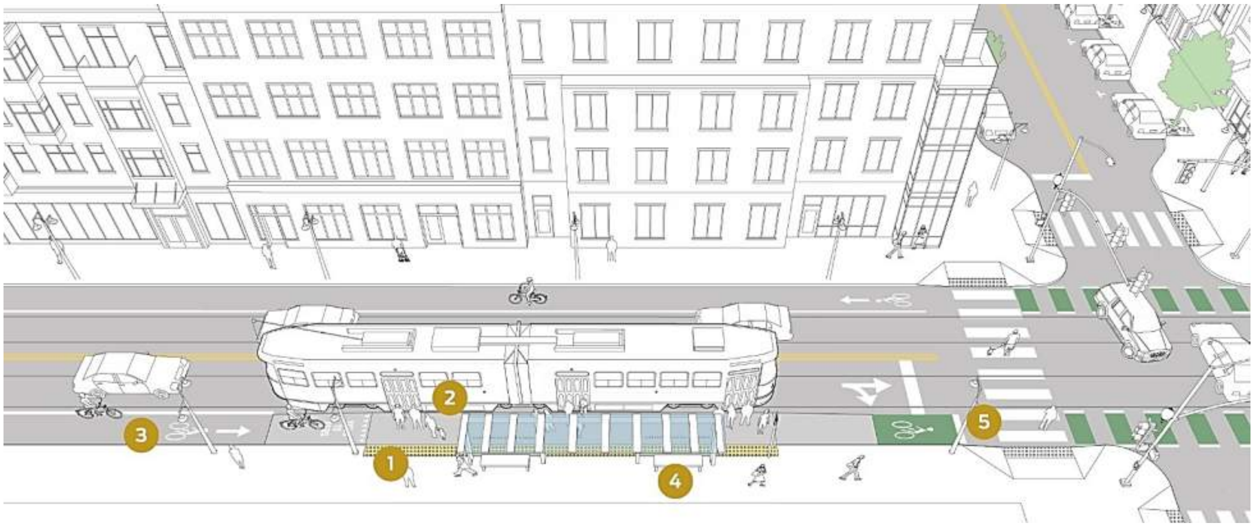
Intermodal Route Connectivity

The future transit network was overlaid with existing bicycle and pedestrian facilities to understand intermodal route connectivity. Pedestrian facilities in Florence generally connect the arterial street network to bus stops. Bicycle facilities in Florence provide less connectivity to the transit system.

When considering roadways that need to support transit vehicles, bicycles, and private vehicles, there can be constrained right-of-way to accomplish the range of safety, connectivity, and mobility goals for a particular street. The National Association of City Transportation Officials (NACTO) Transit Street Design Guide was reviewed for potential intermodal route connectivity solutions. Based on the existing street widths and classifications, transit routes, and bicycle facility gaps in Florence, the following two solutions will be considered within the city.

- Shared lanes with a mix of transit vehicles, bicycles, and private vehicles. The following recommendations are provided in the NACTO Transit Street Design Guide:
  - This treatment is appropriate on roadways where bus volumes are moderate and/or where bus speeds are low
  - Along segments where buses and bicyclists are not expected to pass each other, shared lanes may be 10 to 11 feet
  - If passing is anticipated, shared lanes may be 13 feet wide
  - For roadways where there is adjacent parking, the combined width of the shared lane and parking lane is recommended to be 19 to 21 feet wide
- Shared cycle track stops. The following recommendations are provided in the NACTO Transit Street Design Guide:
  - This treatment is appropriate on higher classification roadways where there are in-lane stops and a bike lane or protected bike lane along the segment
  - Special consideration is needed for width of cycle track, placement of bicycle ramps, curbside activity restrictions, and proximity to turning traffic

Exhibit 2: Example Shared Cycle Track Stop Configuration from NACTO Transit Street Design Guide



1. Detectable warning strips and shark's teeth yield markings
2. Accessible waiting and boarding areas
3. Bike ramps that consider maintenance, visually impaired passengers, and curbside conflicts
4. Shelters that are transparent and open to the building side
5. Ensure bicyclists are visible for turning traffic and queue in front of transit vehicles

Source: NACTO Transit Street Design Guide (https://nacto.org/publication/transit-street-design-guide/stations-stops/stop-configurations/shared-cycle-track-stop/)

Freight

As detailed in *Tech Memo #3A: Transportation System Inventory*, OR 126 and US 101 (from the intersection of OR 126 south) are the designated ODOT freight routes in Florence. Additionally, the city has a policy of accommodating local freight traffic on Kingwood Street via 9th Street, 27th Street, and 35th Street.

Two of the major freight generators identified in *Tech Memo #3A* (Florence Municipal Airport and Florence Industrial Park) are located off Kingwood Street, as well as the City's Public Works Department building. Of the remaining freight generators, the city's four grocery stores are all located on US 101, and the Port of Siuslaw is accessible from OR 126 via Quince Street or from US 101 via 2nd Street.

The following alternatives were developed to address potential issues with freight traffic:

- Ensure that planned pedestrian and bicycle improvements on City streets with local freight traffic (Kingwood Street, 9th Street, 27th Street, 35th Street, Quince Street, and 2nd Street) are designed to allow for safe and distinct space for all modes.
- Develop policies related to maintenance along designated freight routes to ensure the facilities do not become degraded over time.
- Develop policies related to pedestrian and bicycle facilities along designated freight routes to ensure greater separation of travel modes.
- Establish truck loading zones within the downtown area and develop policies related to the use of the truck loading zones, specifically for businesses on Bay Street.

Rail

There are no rail facilities within Florence and the nearest passenger rail service is located in Eugene/Springfield. The Coos Bay Rail Link, a 134-mile rail line which runs between Eugene and Coos Bay and is operated by the Port of Coos Bay, crosses the Siuslaw River approximately 2.5 miles east of Florence.

The current TSP identifies the rail overpass at Cushman as deficient: the clearance over OR 126 was below the optimal 18 feet, and during high water or high tides, this section of OR 126 is prone to flooding. Raising the rail overpass would likely require a full railroad bridge replacement over the Siuslaw River, given how close the highway and the rail overpass are to the river. In 2012, a rough estimate for this project (raising the overpass and rebuilding the bridge) was $100 million to $150 million, well beyond the financial means for the Coos Bay Rail Link, the Port of Coos Bay, or the Port of Siuslaw. The current TSP includes a policy to "promote a feasibility study to identify solutions to the deficient rail overpass in Cushman, and support implementation of the chosen alternative."

The following alternatives were developed to address rail transportation:

- Work with Link Lane on adding runs or adjusting existing runs to better coordinate with Amtrak and Cascade POINT service at the Eugene Amtrack Station.

Air

The Florence Municipal Airport is the lone aviation facility in the city. The airport has a single, 3,000-foot paved and lighted runway and is open 24 hours a day, 7 days a week. The airport is home to 25 aircraft – 21 single engine planes, two helicopters, one multi-engine plane, and one jet plane – and there are an average of 134 aircraft operations per week.

The airport completed an Airport Master Plan Update in 2010, which the Florence City Council adopted. The current TSP also outlines projects and policies related to the airport. The project and policies from these two plans are outlined below:

- Airport Master Plan Update projects
  - Runway and Taxiway Extension (Phase 1): Construct the 400-foot north runway extension with a 200-foot displaced threshold for obstruction clearance.
  - Runway and Taxiway Extension (Phase 2): Eliminate the 200-foot displaced threshold for Runway 15 by removing approximately 87,100 cubic yards of material from the sand dune.
  - Runway and Taxiway Extension (Phase 3): Remove approximately 116,200 cubic yards of additional material from the sand dune.
  - Non precision Instrument Approach: The development of an instrument approach is recommended for Runway 15/33.
  - North Landside Development Area: The preferred alternative includes space reserved for development of additional conventional hangars, T-hangars and aircraft apron. As currently planned, the north landside area provides storage capacity for approximately 60 additional aircraft.
- Other projects and policies
  - As the use of the airport increases, and night operations become a reality, the City shall work with neighboring residential uses to minimize issues of noise and vibration.
  - The City shall protect current and future viability of the airport and compatibility of land uses through the Public Airport Safety and Compatibility Overlay Zone and coordination with the Oregon Department of Aviation and the Federal Aviation Administration.
  - Coordinate between the City of Florence and the Florence Municipal Airport on extending Pacific View Drive to Rhododendron Drive.

Safe Routes to School

Safe Routes to School (SRTS) plans make it safer for students to walk, bike, or take public transit to school. Safer routes encourage more walking and biking and provide convenient and accessible options to and from school and in surrounding neighborhoods. SRTS programs include six components known as the Six E's: evaluation, education, encouragement, engineering, enforcement, and equity. This section provides a summary of the Six E's and identifies alternatives to be considered by the City.

SAFE ROUTES TO SCHOOL – SIX E'S

Education

The education component provides students and residents with information such as transportation options and the benefits of walking and biking to school. Education strategies for SRTS programs include identifying who needs to receive the information, what information needs to be shared, and how to convey the messages. Education components could include:

- Educational videos
- Structured skill practice training
- Lessons integrated into classroom subjects
- Media: radio, internet videos, newspaper articles, and television features

Encouragement

The encouragement component is most closely linked to the education component of a SRTS program. Encouragement strategies generate excitement and interest in walking and biking through events and activities. The encouragement component rewards participation and is used to increase the number of students who walk and bike to school. Encouragement strategies can be used to garner support for other SRTS components such as installing sidewalk. Encouragement components could include:

- Special events, such as international walk to school events
- Mileage clubs and contests
- Ongoing activities
  - Walking school bus or bicycle train
  - Park and walk
  - On-campus walking activities

Engineering

The engineering component of a SRTS program identifies design, implementation, operations and maintenance of physical improvements aimed at addressing specific needs which make walking and biking to school safer, more comfortable and convenient. An evaluation of the school environment is necessary to identify engineering problems and solutions. Engineering components could include:

- Pedestrian and bicycle facilities: sidewalks, crosswalks, bike lanes, bicycle racks, etc.
- Pedestrian and bicycle signage and signals equipment
- Enhanced crossing treatments: curb extensions, raised median islands, flashing beacons

Enforcement

Enforcement is included as part of a SRTS program to reinforce the objectives of the program and deter unsafe traffic behaviors and encourage all road users to obey traffic laws and share the road safely. Enforcement strategies involve a network of community members who promote safe walking, biking and driving. Enforcement components could include:

- Identifying unsafe behaviors
    - Driver behaviors (e.g., speeding, failing to yield to pedestrians/bicyclists, running red lights, passing stopped school buses, parking in crosswalks, etc.)
    - Pedestrian and bicyclist behaviors (e.g., not following direction of crossing guards, crossing at undesirable locations, riding in traffic, no wearing bike helmet, etc.)
- Community enforcement (e.g., safety patrols, adult school crossing guards, neighborhood speed watch programs, etc.)
- Law enforcement methods (e.g., speed trailers, active speed monitors, traffic complaint hotlines, photo enforcement, etc.)

Evaluation

The evaluation component assesses which strategies and approaches are successful. Evaluation of SRTS programs ensure that initiatives support equitable outcomes, identify unintended consequences or opportunities to improve effectiveness and ensure there are adequate resources to implement all components of a SRTS program. Evaluation components could include:

- Data collection; surveys, observations
- Information sharing
- Walkability assessment
- Records of citations

Equity

Equity in a SRTS program ensures that program initiatives are benefiting all demographic groups. This component is especially important to ensuring safe, healthy, and fair opportunities for low-income students, students of color, students of all genders, students with disabilities and others. Incorporating equity efforts into all components of a SRTS could include:

- Assessing whether the recipient of education efforts reflect larger demographic patterns of the community
- Ensuring encouragement activities are available to low-income students and students of color
- Ensuring policy and physical improvements are implemented in low-income communities and communities of color
- Ensuring law enforcement officers build trust with communities and do not target students of color, low-income students, or other community residents
- Initiating efforts that decrease health disparities

SAFE ROUTES TO SCHOOL ALTERNATIVES

The SRTS alternatives considered for Florence are summarized below:

- Work with the local school districts to develop SRTS plans.
- Develop education programs that provide students with information on transportation options and the benefits of walking and biking to school.
- Develop encouragement programs that generate excitement and interest in walking and biking through events and activities.
- Continue to implement physical improvements to the transportation system aimed at making walking and biking to school safer, more comfortable and convenient.
  - Several alternatives are identified within the pedestrian and bicycle sections of this memorandum that could help the city further enhance the transportation system around schools.
- Develop an evaluation program that assesses which strategies and approaches are successful.
- Develop an equity program that ensures that program initiatives are benefiting all demographic groups.

Safety

Traffic safety plays an important role in developing the most appropriate alternatives for a given gap or deficiency, particularly in areas where real or perceived safety risks may prevent people from using more active travel modes, such as walking, biking, and taking transit. The real or perceived safety risks may reflect the crash history of an area or the physical and/or operational characteristics of the roadways (winding curves, steep grades, high traffic volumes, high travel speeds, excessive heavy vehicles, etc.). Several methodologies have been developed to analyze and identify alternatives for addressing traffic safety within an area. Many of which are documented in the Highway Safety Manual (HSM) as well as several other resources developed by ODOT for addressing safety along roadway segments, at intersections, and for pedestrian and bicyclists.

SAFETY COUNTERMEASURES

This section summarizes the countermeasures considered for implementation to address traffic safety along roadway segments, at intersections, and for pedestrians and bicyclists. Note: many of the countermeasures overlap, which illustrates how some countermeasures address multiple safety issues.

Roadway Segments

There are a variety of potential safety solutions that can be applied within Florence to address systemic crashes that occur along roadway segments, such as head-on collisions, sideswipes, and run off the road crashes as well as general speeding and other driver behaviors.

- Enhanced signs and pavement markings for curves (with and without flashing beacons)
- Tree/vegetation removal

- Street lighting
- Speed reduction treatments/traffic calming
- Enhanced enforcement
- Roadway reconfiguration

Intersections

There are a variety of potential safety solutions that can be applied within Florence to address systemic crashes that occur at intersections, such as angled crashes, turning movement crashes, rear-end crashes, and crashes that involve other travel modes (pedestrian, and bicycles).

- Enhanced signs and pavement markings (e.g. stop signs, warning signs, and/or beacons)
- Enhanced visibility of the intersection for entering vehicles (e.g. warning signs, street name signage on both sides of the road, and intersection lighting)
- Application of traffic control devices (signs, markings and signals)
- Signal improvements (e.g. signal timing, signal phasing)
- Left-turn phasing (e.g. permitted, protected, permitted-protected)
- Enhanced enforcement
- Pedestrian and bicycle improvements (see below)
- Intersection lighting
- Speed reduction treatments/traffic calming
- Roundabouts

Pedestrian and Bicycle

There are a variety of potential safety solutions that can be applied within Florence to address pedestrian and bicycle safety. The following provides a summary of the solutions by traffic control.

Signalized Intersections

Pedestrian Safety Solutions

- Street lighting
- Right-turn channelization
- Countdown pedestrian heads
- Leading pedestrian interval
- Left-turn phasing
- Vehicle turning movement restrictions
- Curb extensions (bulb-outs, neck downs)

Bicycle Safety Solutions

- Street lighting
- Bicycle signal
- Bicycle detection
- Pavement markings
- Right-turn channelization
- Leading bicycle interval
- Left-turn phasing
- Vehicle turning movement restrictions
- Protected intersection design
- Forward bicycle queueing area (bike box)

Unsignalized intersections

Pedestrian Safety Solutions

- Street lighting
- Enhanced crossing treatments
- Reduced curb radii
- Pedestrian refuge island or median
- Speed reduction treatments
- Vehicle turning movement restrictions
- Raised crosswalks

Bicycle Safety Solutions

- Street lighting
- Enhanced crossing treatments
- Reduced curb radii
- Skip Striping
- Supplemental signs and markings
- Bicycle boulevards
- Longitudinal bike stencil
- Speed reduction treatments
- Vehicle turning movement restrictions
- Strip bike lanes
- Raised crossings

Roadway segment – No traffic control

Pedestrian Safety Solutions

- Street lighting
- In-roadway warning lights
- Pedestrian-activated warning beacons
- Access management
- Sidewalks street lighting
- Enhanced mid-block crossing treatments
- Road reconfiguration
- Pedestrian refuge island or median

Bicycle Safety Solutions

- Access management
- Bicycle route signage
- Longitudinal bike stencil
- Separated bike lanes
- Dynamic warning signs
- Enhanced mid-block crossing treatments
- Street lighting
- Restrict on-street parking
- Road reconfiguration
- Refuge Island or median

SAFETY ALTERNATIVES

The safety alternatives are summarized in Table 8. These alternatives are intended to address safety issues identified at the study intersections. Many of these alternatives will also address operational deficiencies described earlier in this memorandum. The alternatives shown in **bold** are identified in the current TSP.

Table 8: Safety Alternatives

Intersection	Considerations	Alternatives
ODOT Intersections		
US 101/ Heceta Beach Rd	» Excess proportion of turn movement crashes	» Install advance intersection warning signs with flashing beacons » Install southbound dynamic speed feedback sign after entering Florence

		» Provide traffic calming measures on US 101 approaching the intersection » Install intersection lighting
US 101/ Munsel Lake Rd	» Excess proportion of turn movement crashes	» Install advance intersection warning signs with flashing beacons » Evaluate need for traffic control modification (see intersection alternatives) » Provide traffic calming measures on US 101 approaching the intersection » Install intersection lighting
US 101/ 46th St	» Excess proportion of turn movement crashes	» Install advance intersection warning signs with flashing beacons » Provide traffic calming measures on US 101 approaching the intersection » Install street name signs » Install intersection lighting » Trim/remove vegetation
US 101/ OR 126	» Excess proportion of rear-end crashes	» Provide traffic calming measures on US 101 and OR 126 approaching the intersection » Increase visibility of traffic signal heads (larger bulbs, reflective backplates, etc.)
US 101/ Rhododendron Dr	» Excess proportion of rear-end crashes	» Provide traffic calming measures on US 101 approaching the intersection » Increase visibility of traffic signal heads (larger bulbs, reflective backplates, etc.)
OR 126/ Quince St	» Intersection crash rate exceeds 90th percentile rate » Intersection crash rate exceeds critical crash rate » Excess proportion of angle crashes	» Evaluate need for traffic control modification (see intersection alternatives) » Provide traffic calming measures on OR 126 approaching the intersection » Install additional street lighting
City Intersections		
Rhododendron Dr/ Heceta Beach Rd	» Intersection crash rate exceeds 90th percentile rate » Excess proportion of angle crashes	» Install advance intersection warning signs on Heceta Beach Rd » Provide traffic calming measures on Heceta Beach Rd approaching the intersection » Trim vegetation in SE and SW corners to increase sight distance

		» Install intersection lighting
Kingwood St/ 15th Street	» Intersection crash rate exceeds 90th percentile rate	» Install advance intersection warning signs on Kingwood St » Provide traffic calming measures on Kingwood St approaching the intersection » Trim vegetation in SE corner to increase sight distance
Kingwood St/ 9th Street	» Intersection crash rate exceeds 90th percentile rate » Intersection crash rate exceeds critical crash rate » Excess proportion of angle crashes	» Install advance intersection warning signs on 9th St » Evaluate need for traffic control modification (see intersection alternatives) » Install additional intersection lighting

In addition to the Safety Alternatives identified in Table 8, several additional alternatives were considered along specific roadways:

- Heceta Beach Road – implement traffic calming/speed reduction treatments from Rhododendron Drive to US 101.
- Munsel Lake Road – implement traffic calming/speed reduction treatments from US 101 to N Fork Road.
- N Fork Road – implement traffic calming/speed reduction treatments from US 101 to Munsel Lake Road.
- Park Village Drive-Loop – implement traffic calming/speed reduction treatments around loop.

Local Street Connectivity

Most streets in Florence are classified as local streets. Many local streets were built on a grid system while others were built on a network of cul-de-sacs and stub streets, which limits the potential for future connections. These streets can be desirable to residents because they tend to have lower traffic volumes and travel speeds; however, cul-de-sacs and stub streets result in longer trip distances, increased reliance on arterials and collectors for local trips, and limited options for people to walk and bike to the places they want to go.

Incremental improvements to the street system can be planned carefully to provide route choices for motorists, cyclists, and pedestrians while accounting for potential neighborhood impacts. In addition, the quality of the transportation system can be improved by making connectivity improvements to the pedestrian and bicycle system separate from street connectivity, as discussed in the previous sections. The following summarizes the potential local street connection and extension opportunities within Florence.

LOCAL STREET CONNECTIONS

There are a number of areas within Florence that could experience future development or redevelopment, including in the southwest, south, and north parts of the City. Within these areas, there are opportunities for new local streets that could improve access and circulation for all travel modes. Figure 1 illustrates the location of the local street connections. The lines shown in Figure 1 represent potential connections and the general direction for the placement of the connection. In each case, the specific alignments and design will be determined upon development review.

Emerging Transportation Technologies

Transportation technologies are rapidly evolving, and cities are evaluating what steps they can take to be prepared. The challenge is that most emerging technologies are initiated by the private sector and can be difficult to predict. So how can cities use their money efficiently while also seeing the benefits of emerging technology? The following summarizes several steps the City can take to prepare for emerging technology.

TRANSPORTATION TECHNOLOGY LIAISON

A transportation technology liaison is someone who facilitates connections between the city and private sector companies offering various forms of emerging technologies. The liaison could be a City employee, an employee of a public or private organization, or a private contractor. The liaison role could also be developed in coordination with Lane County, University of Oregon, and/or others (see stakeholder connection for more potential roles and responsibilities of the liaison).

PUBLIC PARTNERSHIPS

Public partnerships are strategic partnerships with public entities in the region, state, or nation which can provide value to the City in the form of collaboration or other means depending on the partnership. The two primary public partnerships which may be most beneficial to the City are university partnerships and city partnerships.

- University partnership can be beneficial to the City by providing them with a direct connection to students and research programs. In addition, the partnership can create student interest and engagement with the City and encourage students to come to Florence after completing their studies.
- City partnerships can be beneficial to the City by allowing them to pool resources and collaborate on emerging technologies and to support users in the region so that emerging technologies do not stop at the city limits.

Private Sector Incentives

Private sector incentives are incentives provided to private sector companies that focus on emerging technologies to encourage them to operate in the City. These incentives could include financial assistance to help with the start-up cost or other incentives that lower the bar for operating within the City.

PRIVATE SECTOR POLICIES

As emerging technologies are primarily initiated by private sector companies, cities need to find a way to effectively work with these companies if they want to be supported by the emerging technologies. The primary connecting point of cities and private sector companies is through policy. Currently, the prime example of this interaction can be found in cities with micro mobility services, such as e-scooters. However, as private sector companies advance autonomous vehicle fleets and other technologies, these policies could become instrumental in maintaining a healthy transportation network. For example, policies that prevent an autonomous vehicle from using a specific cut through route and prioritizing routes that utilize the City's arterial network.

REVIEW CURRENT POLICIES

In addition to crafting new policy to accommodate emerging technologies, the review of current policies can be an effective first step to prepare the city for emerging technologies. Cities preparing for emerging technologies should review their current policies through the lens of the future technology they plan to accommodate. If the policy hinders or prohibits the desired future technology, alterations should be considered for that policy. Specifically, a review of the development code can be effective to find and alter policies that could prevent future flexible use areas as many innovative technologies push the boundaries of traditional land uses.

TECHNOLOGY INCUBATORS AND STARTUP LABS

As a focus on creative problem solving has emerged and startup businesses have begun to gain popularity, Technology Incubators and Startup Labs have become an effective means to foster innovation and entrepreneurship. Technology Incubators (commonly referred to as Incubators) and Startup Labs provide infrastructure for new ideas and emerging businesses to grow.

INFRASTRUCTURE

Investing in new infrastructure is often the first step cities take in preparing for emerging technologies. However, as emerging technologies are driven by the private sector, they can change rapidly and may not require major changes to the existing system to be effective. The following summarizes infrastructure improvements that could be useful to consider now in anticipation of the future transportation system.

EV Charging Stations

Electric vehicle (EV) charging stations are critical in accelerating the adoption of electric vehicles and other types of electric transportation. EV charging stations could be provided in many areas through the city to support the growing use of EVs. Potential locations in the City of Florence include: PeaceHealth Pease Harbor Medical Center, Old Town, Safeway, Fred Meyer, and the Three Rivers Casino Resort. Additionally, EV charging stations could be a requirement of private development.

Electric vehicle charging station funding is available through the Federal Highway Administration (FHWA) National Electric Vehicle Infrastructure (NEVI) formula funding program made available each fiscal year (FY) through FY 2026. In September 2022, it was announced the FHWA approved Oregon's state plan for $100 million funding for EV charging infrastructure. About two-thirds of the funding must be spent along identified Alternative Fuel Corridors. The FHWA has identified 11 roads as Alternative Fuel Corridors including US 101. The remaining funds will be used to close EV infrastructure gaps will be used for charging sites in rural and urban areas, underserved communities, and multi-family housing complexes. According to the Oregon National Electric Vehicle Infrastructure Plan, Oregon anticipates building out US 101 EV charging infrastructure with FY 2024 funding but has not yet identified where along US 101 infrastructure will be placed. EV charging stations may be provided in the City through NEVI funding.

Curb Management

As the city develops, curb management will become more important to ensure an efficient use of the space. The City should begin to develop curbside prioritization and management frameworks to help influence decision making based on user priority. Cities should evaluate how to allocate curbside priority for buses, bikes, freight, and individual vehicles. The National Association of City Transportation Officials (NACTO) Blueprint for Autonomous Urbanism provides, "a vision for how autonomous vehicles, and technology more broadly, can work in service of safe, sustainable, equitable, vibrant cities." The Blueprint asserts that autonomous vehicles offer opportunities for many benefits, however if not developed effectively could also exacerbate existing challenges and create new challenges. When an autonomous fleet becomes available to cities, parking in the quantity it is provided today will likely not be necessary. The City should begin to make plans for adaptive reuse of parking areas and find alternative uses for parking around the city, especially near mobility hubs. Considerations for pick-up drop-off zones at key destinations that are more likely to be used by mobility on demand, ride sharing, and taxi services.

CONNECT WITH STAKEHOLDERS ABOUT EMERGING TECHNOLOGIES

When adopting emerging technologies into the transportation system, it is important to connect with stakeholders prior to adoption to ensure the service can be offered throughout the city and surrounding area. The transportation needs of the community are not contained within the UGB of the city nor are the needs contained to only streets owned and operated by the City. Key stakeholders for the City include local residents, Lane County, and ODOT.

MOBILITY ON DEMAND & INNOVATIVE TRANSIT

Technology advances in ride hailing and other forms of transit (transportation with vehicles not owned by the user) have allowed for some innovative solutions to challenges that have been present in transportation systems for decades. These new transportation services are all in various phases of development and therefore some may not be practical at this time. A common service available now are services that offer mobility on demand such as Uber and Lyft. Mobility on demand is an effective way to offer a transportation alternative that is generally accepted among users around the world already. The addition of mobility on demand offers users a means to go directly from point A to point B without the need to park or return to a specific destination. Establishing these services in the area can also be used as an effective means to set up the city for a future autonomous shuttle service. Multiple mobility on demand service providers have programs developing autonomous technology. If a public-private relationship can be formed and Florence can be included in the service area, then this can open the door for an autonomous shuttle fleet that is funded/provided via private sector funding and through good policy practices these services can be regulated to function in the best interest of the city.

MOBILITY HUBS

Another major step Florence can take now is establishing mobility hubs within the city. Designating them early and building the infrastructure needed to support them is important to the success of the mobility hubs. As a first step in the formation of mobility hubs the City of Florence should identify one primary as well as one secondary mobility hub. The primary will be the priority for transportation infrastructure in the City of Florence and the secondary will be developed when funding already satisfies the needs of the primary. The Grocery Outlet area should be the primary mobility hub as this is currently the only location where the local transit service, The Rhody Express and the two intercity transit services, the Eugene-Florence Connector and Florence-Yachats Connector all operate and a potential secondary hub could be located somewhere in the vicinity of Old Town.

EMERGING TECHNOLOGY ALTERNATIVES

The following summarizes a list of discrete steps (primarily planning and policy related) that the City can take to be prepared for the emergence of new transportation technologies.

- Create a Transportation Technology Liaison Role: This role should serve to carry out the listed tasks below.
- Connect with cities in the surrounding area (Eugene), establish a service zone for any emerging technology coming to the area.
- Develop partnerships and programs with Lane Community College and the University of Oregon to attract students.
- Review the development code and create avenues for flexible uses.
- Hold public outreach to determine which emerging technologies local residents are interested in.
- Meet with ODOT, Lane County, and other relevant jurisdictions in the surrounding area and discuss emerging technologies.
- Establish a primary and secondary mobility hub in the City.
- Consider adding EV charging stations at key destinations (PeaceHealth Pease Harbor Medical Center, grocery stores, Three Rivers Casino Resort, and Old Town) and EV charging requirement to development code.
- Invest in pick-up drop-off loops and adaptive reuse design for any parking structures/lots.
- Allow multiple ride-hailing services and micromobility services (E-scooters, bike share, etc.) to be established in Florence.

Parking Management Strategies

The parking study prepared prior to the start of this project indicates that on- and off-street parking demand is generally below the *effective capacity* of the parking supply throughout most of the study area except Old Town. On- and off-street parking demand in Old Town currently exceeds *effective capacity* during the weekday and weekend peak time periods and is projected to continue to exceed *effective capacity* in the future.

This section identifies several parking policies and strategies the City could implement in Old Town to manage parking demand while improving access and circulation for all travel modes. Many of these strategies could be applied throughout the city to address similar issues if/when they arise. The policies and strategies are organized into five categories as described below.

USER INFORMATION

The first step to improving parking conditions within Old Town is to improve user information. Many parking issues can be improved or resolved with more effective communication about the location, purpose, and availability of parking as well as information about other methods of accessing a destination (e.g., walking, biking, taking transit, etc.).

Old Town attracts many out-of-town visitors who may not have extensive knowledge about parking or alternative transportation options within the city. User information could provide people with information they need to understand the local parking system and the most appropriate ways to use it. The user information policies and strategies that could be implemented within Old Town include:

- Establish consistent branding for public parking facilities, such as a common "P"
- Install wayfinding and signage to help locate available parking
- Develop neighborhood parking maps and post them online and in prominent areas
- Develop *How to Park* or *How to Access Old Town* resources and post them online
- Coordinate with community destinations to develop and distribute materials
- Conduct stakeholder outreach and education to inform public about parking options
- Create a parking ambassador position to provide information and guidance
- Collect and distribute real-time information about parking conditions at key locations

TRANSPORTATION DEMAND MANAGEMENT

The next step in improving parking conditions within Old Town is implementing Transportation Demand Management (TDM) programs and strategies to reduce parking demand by promoting active modes of transportation for commute and non-commute trips. These programs and strategies are particularly effective in reducing parking demand generated by employees of local businesses and supporting alternative modes of accessing local destinations by residents and visitors. The TDM policies and strategies that could be implemented within Old Town are summarized below. A detailed description of potential TDM measures is also provided later in this memorandum.

- Improve pedestrian and bicycle facilities (e.g., sidewalks, bike lanes, safe crossings, bike racks)
- Improve transit facilities and services (e.g., frequency, hours of operation, stop amenities)
- Increase transit supportive programs and services (e.g., free transit passes, trip planning)
- Improve safety and security (e.g., neighborhood watch, community policing, special police patrols, improved lighting, pedestrian escorts, monitoring of facilities)

PARKING MANAGEMENT

The tools and strategies below are intended to encourage more efficient use of the existing parking supply and improve the quality of service provided to parking users. When parking demand regularly exceeds the *effective capacity* of the parking supply, these tools and strategies can be used to help manage parking.

- Require good neighbor agreements between local businesses and associations
- Establish parking collaborative to align the City's interests with local businesses
- Implement/recalibrate time limits and/or user restrictions
- Establish parking zones (e.g., loading zones, pick-up/drop-off zones)
- Implement and manage an area parking permit program
- Implement and manage a paid parking program
- Complete a neighborhood audit – this was completed as part of the parking study
- Monitor, measure and evaluate the performance of the parking system

ENFORCEMENT

The following tools and strategies are intended to improve enforcement of parking management strategies. Almost all parking management strategies require regular enforcement to be effective. In general, parking enforcement should be frequent, fair, friendly, and designed to encourage proper parking behavior, not to discourage users from accessing an area.

- Implement regular parking enforcement of parking requirements
- Implement focused enforcement in problematic areas
- Issue warnings to first time parking violators
- Implement a periodic ticket forgiveness program to improve the perception of parking enforcement and clear a potential backlog of unpaid parking tickets
- Extend enforcement hours as necessary to reflect the needs of Old Town
- Implement a graduated citation structure that is lenient on infrequent or first time violators and more punitive on repeat offenders

INCREASE THE PARKING SUPPLY

The following tools and strategies are intended to increase the parking supply. Generally speaking, constructing relatively large amounts of new parking should be a last resort, as it is a major investment that has a long life and can significantly alter the character and landscape of an area. Constructing new parking areas can also be difficult in locations with space constraints, such as Old Town.

- Convert no-parking areas to parking areas, particularly in areas where existing restrictions are no longer needed
- Create motorcycle or compact vehicle parking in areas that are insufficient for a regular parking stall

- Reconfigure existing off-street parking facilities to identify additional space for parking
- Restripe parallel parking to angled parking (e.g., front-in or back-in angle parking)
- Convert travel lanes to parking lanes during off-peak periods or on a permanent basis
- Establish remote parking areas that are served by transit to relocate parking demand to the fringe area of the community
- Allow multiple proximate land uses to share a common parking supply, particularly if peak parking demand occurs at different times
- Establish public-private partnerships to open access to existing private parking facilities or construct new parking (for instance, through co-financing) to serve both site-specific users and the general public.
- Construct a new parking facility - If all other parking management tools and strategies have been implemented and parking demand continues to exceed the *effective capacity* of the parking supply, it may be necessary to construct a new parking facility.

Strategies for Old Town

Florence's Old Town neighborhood, centered around Bay Street and the city's waterfront along the Siuslaw River, is the city's downtown with a wide range of dining and shopping options. The neighborhood, with a tight street grid, is a reasonably accessible place to get around by foot, bike, or car. While there are sidewalks on most streets, the sidewalk network isn't complete in all places, and not all curb ramps are accessible for people with mobility devices. Conversely, there is limited to no bicycle infrastructure for anyone getting around. Parking can sometimes be an issue along Bay Street, but the neighborhood generally has ample parking availability, as found in the City's *Parking Data Collection Assessment Summary* from June 2021.

Like many communities, the Old Town neighborhood has added outdoor dining during the COVID-19 pandemic. This approach to using street space for non-automotive use should foster a renewed focus on improving accessibility for all modes to the city's downtown. Table 9 below outlines all of the walking, biking, transit, and freight alternatives, and general accessibility is a broad theme. The alternatives shown in **bold** are identified in the current TSP.

Table 9: Old Town Alternatives

Roadway	Considerations	Alternatives
Street System Alternatives		
Bay Street US 101 Bridge to Nopal Street	» Narrow sidewalks with limited opportunities for outdoor seating » Limited pedestrian and bicycle facilities and ADA accommodation » Limited parking opportunities	» Convert to one-way westbound » Convert to one-way eastbound » Convert to a festival Street – Restrict vehicle traffic during events through use of removable bollards » Complete a streetscape plan

Pedestrian Alternatives		
2nd St US 101 to Harbor St	» Sidewalk gaps and narrow sidewalks on both sides » Enhanced crosswalk at US 101/2nd St » Connects US 101 and OR 126 via Quince St	» **Fill sidewalk gaps within Old Town** » Reconstruct existing sidewalks with landscape strips » Install enhanced crossings at Nopal St, Oak St, Harbor St (e.g., marked crosswalks with curb extensions)
Bay St Kingwood St to Maple St	» Complete sidewalks on both sides » High level of traffic stress (narrow sidewalk width, no buffer)	» Reconstruct sidewalks to increase width » Install curb extensions at Kingwood St, Laurel St, Maple St, and mid-block by the boardwalk » **Install mid-block crosswalk at Bay St/ Nopal St corner by the boardwalk** » Develop a streetscape design plan
Laurel St-Old Town Wy US 101 to Maple St	» Sidewalk gaps on Laurel St and Old Town Wy » Streets run through downtown Florence and connect to US 101	» **Fill sidewalk gaps on both sides**
Maple St US 101 to Bay St	» Sidewalk gaps on one side » Connects US 101 with downtown Florence	» Fill in sidewalk gaps on one side
Bicycle Alternatives		
2nd St US 101 to Harbor St	» Shared lane pavement markings exist from Maple St to the east » Approximately 20-foot lanes (including on-street parking)	» Do nothing » Extend shared lane pavement markings from Maple St to US 101
Bay St Kingwood St to Maple St	» No existing bike infrastructure » Low level of bicycle traffic stress » Commercial center of Florence with lots of pedestrians » Public input seeks to improve walking and biking experience	» Do nothing » Add shared lane pavement markings
Laurel St-Old Town Wy US 101 to Maple St	» No existing bike infrastructure » Streets run through downtown Florence and connect to US 101	» Do nothing » Add shared lane pavement markings
Maple St US 101 to Bay St	» No existing bike infrastructure » Connects US 101 with downtown Florence	» Do nothing » Add shared lane pavement markings

Transit Alternatives		
Potential Mobility Hub Locations	» As a first step in the formation of mobility hubs, Florence should identify one primary as well as one secondary mobility hub. The primary will be the priority for transportation infrastructure in the City of Florence and the secondary will be developed when funding already satisfies the needs of the primary. » Mobility hubs are most effective next to transit stops where other mobility options (bikeshare, carshare, scooters, etc.) are available.	» Explore establishing a secondary mobility hub at the Port parking lot (1st St and Nopal St)
Freight Alternatives		
Old Town	» Trucks frequently double park to make deliveries » Deliveries occur at all times of the day	» Establish truck loading zones within the downtown area and develop policies related to the use of the truck loading zones, specifically for businesses on Bay Street.

Funding Programs

The following summarizes current and potential future funding sources for transportation improvements.

CURRENT AND POTENTIAL FUTURE FUNDING SOURCES

The city of Florence currently received funding from the state gas tax, which is comprised of proceeds from excise taxes imposed by the state and federal government, and from several local sources, including transportation system development charges (SDCs), franchise fees for solid waste processing, intergovernmental revenues from formula funding and grants, a street lighting fee, and interest income and transfers.

Based on the current transportation funding sources identified above, Florence will likely need to identify additional funding sources that can be dedicated to transportation-related capital improvement projects over the next 20 years. The City will likely rely upon transportation improvements grants, partnerships with regional and state agencies, and other funding sources to help implement future transportation-related improvements. Table 10 summarizes the funding opportunities and identifies the intended use of the funds and any applicable project types.

Table 10: Funding Opportunities Summary

Funding Source	Intended Use
Federal Sources	
Infrastructure Investment and Jobs Act (IIJA)	The bipartisan infrastructure bill signed into law in 2021 to fund road, bridge, bicycling, and pedestrian improvements

Surface Transportation Block Grant (STBG) Program	Preserve and improve surface transportation investments from a flexible funding source
TA Set-Aside	Smaller-scale transportation projects
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	Support programs that reduce emissions from transportation-related activities
Highway Safety Improvement Program (HSIP)	Reduce traffic fatalities and serious injuries on all public roads
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants	Road, rail, transit, and port projects that achieve national objectives and have significant local and regional impact
Recreational Trails	Develop and maintain recreational trails and trail-related facilities
National Highway Performance Program (NHPP)	Projects that improve conditions along NHS Routes
State Sources	
Statewide Transportation Improvement Program (STIP)	Multi-modal projects on federal, state, and local facilities
State Highway Trust Fund	Bicycle and pedestrian infrastructure improvements
Sidewalk Improvement Program (SWIP)	Projects that enable people to move across or around the state highway system
Safe Routes to School (SRTS)	Projects that improve safety for children walking or biking to school
All Roads Transportation Safety (ARTS)	Projects that address hotspot and systemic safety issues and concerns (roadway departure, intersection safety, and bicycle and pedestrian safety); part of STIP program and utilizes federal HSIP funds
Oregon Community Paths (OCP) Program	Create and maintain connections through shared-use paths
House Bill 2017	Create a steady funding stream for statewide transportation improvements
Local Sources	
SDCs	Increase capacity of transportation system to accommodate growth
Tax-Increment Financing (TIF)	Provide additional funding for transportation infrastructure
Local Fuel Tax	Adds a tax on top of gasoline costs that support street operation, maintenance, and preservation
Local Improvement Districts (LIDs)	Pools funds from property owners to make local transportation improvements

Economic Improvement Districts (EIDs)	Pools funds from area businesses to make improvements in the business district.
Urban Renewal/Tax Increment Financing	Raises revenue from increased property values in an area to fund localized improvements
Local Bond Measures	Asks voters for bond funding to finance a set list of infrastructure investments
Street Utility Fee/Road Maintenance Fee	Calculates trips generated for land uses and charges owners a fee relative to the number of trips

Development Code Amendments

Oregon Administrative Rule (OAR) 660, Division 12, also known as the Transportation Planning Rule (TPR), defines the necessary elements of a local TSP and how to implement Statewide Planning Goal 12 – Transportation. The overall purpose of the TPR is to provide and encourage a safe, convenient, and economic 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 TSPs 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. The Florence TSP must be consistent with the TPR, which was amended most recently in 2022.

The TPR requires cities to prepare local TSPs that are consistent with the Oregon Transportation Plan (OTP); Technical Memorandum #1 (Plans and Policy Review) addresses the OTP and other background documents that will be referenced in updating the TSP. Attachment C contains a review of the City's Development Code for compliance with the TPR. The table contained in Attachment C describes how Development Code requirements meet particular TPR sections. The table provides a list of recommended Development Code amendments, recommended modifications that may be necessary to implement the updated TSP, or where local requirements could be strengthened to be more consistent with the TPR. To the extent necessary, suggested draft code language will be prepared at the implementation phase of the TSP update project that supports the policies and recommendations of the draft TSP.

Transportation Demand Management

Transportation Demand Management (TDM) is a general term used to describe any action that removes single occupancy vehicle (SOV) trips from the roadway during peak time periods. As population and employment increase in the city, the number of trips will also increase. The ability to change travel behavior and provide alternative modes will help accommodate the growth in trips without the need for significant investments in new infrastructure. A major focus of TDM is on major employers; however, there are many things the City can do to support TDM implementation. The following summarizes TDM alternatives that can be applied by the City.

- Learn about TDM and the role it can play in achieving local planning objectives
- Encourage and require local businesses to implement TDM solutions
- Work to build partnerships with community organizations to support TDM implementation.

- Help create TDM programs to provide local TDM services
- Improve non-motorized transportation facilities, public transit services, and other transportation services
- Support carshare, ridesharing, bikeshare, e-scooters, and other micromobility services
- Apply more comprehensive transportation planning, including multimodal level of service indicators when evaluating transportation improvements
- Implement TDM strategies, such as commute trip reductions programs for employees, and special transportation management when sponsoring events that attract crowds.

TDM strategies help achieve many of the City's goals, including reduced traffic congestion, reduced parking demand, improved mobility for non-drivers, improved community livability, improved public fitness and health, and others.

Attachments

A. Intersection Operations Analysis Worksheets
B. Enhanced Crossing Treatments
C. Development Code Review

Attachment A Intersection Operations Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	6	216	0	181	4	759	203	184	598	1
Future Volume (veh/h)	0	0	6	216	0	181	4	759	203	184	598	1
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		0.98	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	1300	1300	1750	1436	726	1491	1381	1163	1409	1750
Adj Flow Rate, veh/h	0	0	6	232	0	195	4	816	218	198	643	1
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	0	33	33	0	23	75	19	27	43	25	0
Cap, veh/h	0	0	350	308	0	350	179	837	643	171	907	1
Arrive On Green	0.00	0.00	0.24	0.24	0.00	0.24	0.01	0.56	0.56	0.09	0.64	0.64
Sat Flow, veh/h	0	0	1483	1064	0	1483	692	1491	1146	1108	1406	2
Grp Volume(v), veh/h	0	0	6	232	0	195	4	816	218	198	0	644
Grp Sat Flow(s),veh/h/ln	0	0	1483	1064	0	1483	692	1491	1146	1108	0	1408
Q Serve(g_s), s	0.0	0.0	0.4	25.3	0.0	13.7	0.3	62.8	12.2	10.5	0.0	35.4
Cycle Q Clear(g_c), s	0.0	0.0	0.4	25.7	0.0	13.7	0.3	62.8	12.2	10.5	0.0	35.4
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	350	308	0	350	179	837	643	171	0	908
V/C Ratio(X)	0.00	0.00	0.02	0.75	0.00	0.56	0.02	0.97	0.34	1.16	0.00	0.71
Avail Cap(c_a), veh/h	0	0	357	314	0	357	205	850	653	171	0	908
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)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	34.7	44.6	0.0	39.8	14.0	25.2	14.1	34.9	0.0	13.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	9.7	0.0	1.9	0.0	24.6	0.3	118.9	0.0	2.6
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	0.0	0.0	0.1	7.5	0.0	5.2	0.0	26.6	3.2	10.7	0.0	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	34.7	54.2	0.0	41.7	14.0	49.8	14.4	153.8	0.0	16.3
LnGrp LOS	A	A	C	D	A	D	B	D	B	F	A	B
Approach Vol, veh/h		6			427			1038			842	
Approach Delay, s/veh		34.7			48.5			42.2			48.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.0	71.0		32.4	5.1	80.9		32.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	10.5	67.5		28.5	5.0	73.0		28.5
Max Q Clear Time (g_c+I1), s	12.5	64.8		2.4	2.3	37.4		27.7
Green Ext Time (p_c), s	0.0	1.7		0.0	0.0	5.3		0.2

Intersection Summary			
HCM 6th Ctrl Delay			45.7
HCM 6th LOS			D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	164	244	35	93	116	992	46	1010
v/c Ratio	0.68	0.67	0.27	0.27	0.44	0.65	0.15	0.79
Control Delay	48.6	32.5	36.4	24.9	10.8	15.2	6.2	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	32.5	36.4	24.9	10.8	15.2	6.2	22.0
Queue Length 50th (ft)	76	77	15	27	20	193	8	210
Queue Length 95th (ft)	#218	#231	51	83	38	262	18	299
Internal Link Dist (ft)		1885		563		1469		3402
Turn Bay Length (ft)	225		150		150		100	
Base Capacity (vph)	240	363	132	342	431	2007	536	1915
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.67	0.27	0.27	0.27	0.49	0.09	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	40	1	0	24	30	1065	2	14	1030	21
Future Volume (veh/h)	15	0	40	1	0	24	30	1065	2	14	1030	21
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		0.98
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	1463	1750	1313	1750	1750	1409	1504	1518	1750	1231	1422	1204
Adj Flow Rate, veh/h	16	0	43	1	0	26	32	1133	2	15	1096	22
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, %	21	0	32	0	0	25	18	17	0	38	24	40
Cap, veh/h	177	1	92	121	1	124	395	1872	3	370	1716	34
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	398	11	1101	46	11	1484	440	2954	5	354	2708	54
Grp Volume(v), veh/h	59	0	0	27	0	0	32	553	582	15	547	571
Grp Sat Flow(s),veh/h/ln	1510	0	0	1541	0	0	440	1442	1517	354	1351	1411
Q Serve(g_s), s	0.6	0.0	0.0	0.0	0.0	0.0	1.5	7.3	7.3	0.8	7.9	7.9
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.5	0.0	0.0	9.5	7.3	7.3	8.1	7.9	7.9
Prop In Lane	0.27		0.73	0.04		0.96	1.00		0.00	1.00		0.04
Lane Grp Cap(c), veh/h	270	0	0	246	0	0	395	914	961	370	856	894
V/C Ratio(X)	0.22	0.00	0.00	0.11	0.00	0.00	0.08	0.61	0.61	0.04	0.64	0.64
Avail Cap(c_a), veh/h	974	0	0	958	0	0	572	1494	1572	513	1400	1462
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	1.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	0.0	13.6	0.0	0.0	6.5	3.5	3.5	5.9	3.6	3.6
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	0.0	0.0	0.1	0.7	0.6	0.0	0.8	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.2	0.0	0.0	0.1	0.5	0.5	0.0	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	0.0	13.8	0.0	0.0	6.6	4.1	4.1	5.9	4.4	4.4
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		59			27			1167			1133	
Approach Delay, s/veh		14.3			13.8			4.2			4.4	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		24.7		7.2		24.7		7.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		11.5		3.1		10.1		2.5				
Green Ext Time (p_c), s		8.7		0.2		8.7		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			4.6									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	4	22	17	4	22	32	1125	11	21	1056	36
Future Volume (vph)	34	4	22	17	4	22	32	1125	11	21	1056	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.95			0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1353			1078		1308	2765		1445	2734	
Flt Permitted		0.80			0.84		0.23	1.00		0.22	1.00	
Satd. Flow (perm)		1111			925		316	2765		329	2734	
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)	36	4	23	18	4	23	34	1184	12	22	1112	38
RTOR Reduction (vph)	0	21	0	0	21	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	42	0	0	24	0	34	1195	0	22	1147	0
Confl. Peds. (#/hr)	4					4	2		3	3		2
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	20%	67%	10%	46%	0%	56%	27%	20%	25%	15%	21%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		4.5			4.5		33.9	33.9		33.9	33.9	
Effective Green, g (s)		4.5			4.5		33.9	33.9		33.9	33.9	
Actuated g/C Ratio		0.09			0.09		0.72	0.72		0.72	0.72	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		105			87		226	1977		235	1955	
v/s Ratio Prot								c0.43			0.42	
v/s Ratio Perm		c0.04			0.03		0.11			0.07		
v/c Ratio		0.40			0.28		0.15	0.60		0.09	0.59	
Uniform Delay, d1		20.2			19.9		2.2	3.4		2.1	3.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5			1.7		0.3	0.5		0.2	0.5	
Delay (s)		22.7			21.7		2.5	3.9		2.2	3.8	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		22.7			21.7			3.9			3.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
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)	34	4	22	17	4	22	32	1125	11	21	1056	36
Future Volume (veh/h)	34	4	22	17	4	22	32	1125	11	21	1056	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		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	1477	835	1614	1122	1750	986	1381	1477	1409	1545	1463	1491
Adj Flow Rate, veh/h	36	4	23	18	4	23	34	1184	12	22	1112	38
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, %	20	67	10	46	0	56	27	20	25	15	21	19
Cap, veh/h	201	12	29	200	34	93	354	1792	18	360	1726	59
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	347	104	260	495	298	829	392	2845	29	420	2740	94
Grp Volume(v), veh/h	63	0	0	45	0	0	34	584	612	22	564	586
Grp Sat Flow(s),veh/h/ln	711	0	0	1622	0	0	392	1403	1471	420	1390	1444
Q Serve(g_s), s	2.1	0.0	0.0	0.0	0.0	0.0	2.1	9.2	9.2	1.2	8.8	8.8
Cycle Q Clear(g_c), s	3.0	0.0	0.0	0.9	0.0	0.0	10.9	9.2	9.2	10.4	8.8	8.8
Prop In Lane	0.57		0.37	0.40		0.51	1.00		0.02	1.00		0.06
Lane Grp Cap(c), veh/h	242	0	0	327	0	0	354	884	927	360	876	910
V/C Ratio(X)	0.26	0.00	0.00	0.14	0.00	0.00	0.10	0.66	0.66	0.06	0.64	0.64
Avail Cap(c_a), veh/h	519	0	0	915	0	0	477	1325	1389	492	1313	1364
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	1.00	1.00
Uniform Delay (d), s/veh	15.0	0.0	0.0	14.2	0.0	0.0	7.4	4.1	4.1	7.4	4.0	4.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.2	0.0	0.0	0.1	0.9	0.8	0.1	0.8	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.3	0.0	0.0	0.1	0.9	1.0	0.1	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	0.0	0.0	14.4	0.0	0.0	7.5	4.9	4.9	7.5	4.8	4.8
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		63			45			1230			1172	
Approach Delay, s/veh		15.6			14.4			5.0			4.9	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.5		8.4		26.5		8.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		12.9		5.0		12.4		2.9				
Green Ext Time (p_c), s		9.1		0.2		8.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			5.4									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	160	178	153	160	189	52	742	171	225	850
v/c Ratio	0.68	0.76	0.77	0.72	0.53	0.57	0.87	0.30	0.78	0.65
Control Delay	72.1	77.7	83.0	76.9	12.9	92.3	58.5	9.9	73.1	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	77.7	83.0	76.9	12.9	92.3	58.5	9.9	73.1	34.0
Queue Length 50th (ft)	136	148	138	144	0	46	327	34	192	306
Queue Length 95th (ft)	259	281	270	276	79	111	503	89	#468	532
Internal Link Dist (ft)		1368		448			1440			1918
Turn Bay Length (ft)	275		400			125		100	475	
Base Capacity (vph)	380	370	317	351	459	195	1239	669	290	1431
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.48	0.46	0.41	0.27	0.60	0.26	0.78	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	160	178	153	160	189	52	742	171	225	850
v/c Ratio	0.68	0.76	0.77	0.73	0.53	0.63	0.86	0.30	0.83	0.66
Control Delay	64.2	68.9	75.9	69.7	12.1	90.9	52.6	8.7	74.5	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	68.9	75.9	69.7	12.1	90.9	52.6	8.7	74.5	31.1
Queue Length 50th (ft)	122	132	124	128	0	41	290	26	174	277
Queue Length 95th (ft)	212	229	224	228	70	#113	#504	79	#387	460
Internal Link Dist (ft)		1368		448			1440			1918
Turn Bay Length (ft)	275		400			125		100	475	
Base Capacity (vph)	382	374	299	331	444	99	897	662	272	1293
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.51	0.48	0.43	0.53	0.83	0.26	0.83	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	138	33	199	102	181	50	712	164	216	741	75
Future Volume (veh/h)	154	138	33	199	102	181	50	712	164	216	741	75
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		1.00	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	1545	1450	1463	1327	1504	1477	1368	1463	1286	1354	1450	1559
Adj Flow Rate, veh/h	160	144	34	156	177	0	52	742	171	225	772	78
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	15	22	21	31	18	20	28	21	34	29	22	14
Cap, veh/h	239	184	43	199	237		59	854	505	247	1142	115
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.05	0.31	0.31	0.19	0.45	0.45
Sat Flow, veh/h	1472	1132	267	1264	1504	1252	1303	2780	1085	1290	2519	254
Grp Volume(v), veh/h	160	0	178	156	177	0	52	742	171	225	422	428
Grp Sat Flow(s),veh/h/ln	1472	0	1399	1264	1504	1252	1303	1390	1085	1290	1377	1396
Q Serve(g_s), s	10.2	0.0	12.1	11.8	11.2	0.0	3.9	25.1	10.0	17.0	24.0	24.0
Cycle Q Clear(g_c), s	10.2	0.0	12.1	11.8	11.2	0.0	3.9	25.1	10.0	17.0	24.0	24.0
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	239	0	227	199	237		59	854	505	247	625	633
V/C Ratio(X)	0.67	0.00	0.78	0.79	0.75		0.87	0.87	0.34	0.91	0.68	0.68
Avail Cap(c_a), veh/h	474	0	450	381	454		122	1105	603	331	772	782
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	0.0	39.9	40.3	40.0	0.0	47.1	32.5	16.9	39.3	21.4	21.4
Incr Delay (d2), s/veh	2.4	0.0	4.4	5.0	3.5	0.0	13.6	5.1	0.1	20.1	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	4.4	3.9	4.3	0.0	1.5	8.8	3.3	6.7	7.6	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	44.3	45.3	43.5	0.0	60.8	37.6	17.1	59.4	22.4	22.4
LnGrp LOS	D	A	D	D	D		E	D	B	E	C	C
Approach Vol, veh/h		338			333			965			1075	
Approach Delay, s/veh		43.0			44.4			35.2			30.1	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	49.6		20.1	23.6	35.0		20.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	9.3	55.7		30.0	25.5	39.5		32.0
Max Q Clear Time (g_c+I1), s	5.9	26.0		13.8	19.0	27.1		14.1
Green Ext Time (p_c), s	0.0	4.0		1.0	0.1	3.3		1.1

Intersection Summary	
HCM 6th Ctrl Delay	35.3
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	1.1											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	0	480	30	0	480	17	0	0	101	0	0	6
Future Vol, veh/h	0	480	30	0	480	17	0	0	101	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	3	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	19	28	14	19	25	31	35	28	27	38	29	17
Mvmt Flow	0	511	32	0	511	18	0	0	107	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	529	0	0	543	0	0	1053	1056	272	776	1063	523
Stage 1	-	-	-	-	-	-	527	527	-	520	520	-
Stage 2	-	-	-	-	-	-	526	529	-	256	543	-
Critical Hdwy	4.385	-	-	4.385	-	-	7.825	6.92	7.305	7.87	6.935	6.455
Critical Hdwy Stg 1	-	-	-	-	-	-	7.025	5.92	-	6.67	5.935	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.625	5.92	-	7.07	5.935	-
Follow-up Hdwy	2.3805	-	-	2.3805	-	-	3.8325	4.266	3.5565	3.861	4.2755	3.4615
Pot Cap-1 Maneuver	941	-	-	929	-	-	158	194	665	252	191	518
Stage 1	-	-	-	-	-	-	439	477	-	464	479	-
Stage 2	-	-	-	-	-	-	466	476	-	645	467	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	941	-	-	929	-	-	156	194	665	211	191	517
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	194	-	211	191	-
Stage 1	-	-	-	-	-	-	439	477	-	464	479	-
Stage 2	-	-	-	-	-	-	459	476	-	541	467	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.5	12.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	665	941	-	-	929	-	-	517
HCM Lane V/C Ratio	-	0.162	-	-	-	-	-	-	0.012
HCM Control Delay (s)	0	11.5	0	-	-	0	-	-	12.1
HCM Lane LOS	A	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.6	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	480	0	0	494	51	0	0	0	36	3	108
Future Volume (veh/h)	114	480	0	0	494	51	0	0	0	36	3	108
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		0.98	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	1436	1340	1750	1750	1395	1491	1750	1750	1750	1463	1750	1463
Adj Flow Rate, veh/h	124	522	0	0	537	55	0	0	0	39	3	117
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, %	23	30	0	0	26	19	0	0	0	21	0	21
Cap, veh/h	390	807	0	185	747	77	0	292	0	158	24	184
Arrive On Green	0.60	0.60	0.00	0.00	0.60	0.60	0.00	0.00	0.00	0.17	0.17	0.17
Sat Flow, veh/h	688	1341	0	894	1242	127	0	1750	0	254	141	1102
Grp Volume(v), veh/h	124	522	0	0	0	592	0	0	0	159	0	0
Grp Sat Flow(s),veh/h/ln	688	1341	0	894	0	1369	0	1750	0	1497	0	0
Q Serve(g_s), s	6.0	9.9	0.0	0.0	0.0	11.8	0.0	0.0	0.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	17.8	9.9	0.0	0.0	0.0	11.8	0.0	0.0	0.0	3.8	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.09	0.00		0.00	0.25		0.74
Lane Grp Cap(c), veh/h	390	807	0	185	0	824	0	292	0	365	0	0
V/C Ratio(X)	0.32	0.65	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.44	0.00	0.00
Avail Cap(c_a), veh/h	552	1121	0	395	0	1145	0	833	0	822	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	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.7	5.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	15.1	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.9	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.8	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	0.7	1.2	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	5.9	0.0	0.0	0.0	6.8	0.0	0.0	0.0	15.9	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A	A	B	A	A
Approach Vol, veh/h		646			592			0			159	
Approach Delay, s/veh		7.1			6.8			0.0			15.9	
Approach LOS		A			A						B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.0		27.9		11.0		27.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5				
Max Q Clear Time (g_c+I1), s		0.0		19.8		5.8		13.8				
Green Ext Time (p_c), s		0.0		3.6		0.7		3.8				
Intersection Summary												
HCM 6th Ctrl Delay			8.0									
HCM 6th LOS			A									

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	1	2	11	22	0	20	6	123	33	17	95	1
Future Vol, veh/h	1	2	11	22	0	20	6	123	33	17	95	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	0	50	38	0	11	33	15	29	25	13	100
Mvmt Flow	1	2	13	25	0	23	7	140	38	19	108	1
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	7.4	8.6	9.1	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	7%	52%	100%	0%
Vol Thru, %	0%	79%	14%	0%	0%	99%
Vol Right, %	0%	21%	79%	48%	0%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	156	14	42	17	96
LT Vol	6	0	1	22	17	0
Through Vol	0	123	2	0	0	95
RT Vol	0	33	11	20	0	1
Lane Flow Rate	7	177	16	48	19	109
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.011	0.241	0.019	0.068	0.031	0.152
Departure Headway (Hd)	5.846	4.889	4.284	5.161	5.738	5.024
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	616	739	837	696	626	717
Service Time	3.546	2.589	2.303	3.177	3.45	2.736
HCM Lane V/C Ratio	0.011	0.24	0.019	0.069	0.03	0.152
HCM Control Delay	8.6	9.1	7.4	8.6	8.6	8.6
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0	0.9	0.1	0.2	0.1	0.5

 Traffic Signal Alternative

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	136	21	30	101	67	19	72	27	57	73	41
Future Volume (veh/h)	36	136	21	30	101	67	19	72	27	57	73	41
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	1463	1491	1573	1422	1409	1218	1300	1422	1463	1231	1409	1586
Adj Flow Rate, veh/h	40	151	23	33	112	74	21	80	30	63	81	46
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, %	21	19	13	24	25	39	33	24	21	38	25	12
Cap, veh/h	252	310	43	233	209	123	234	256	86	312	187	86
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	162	1095	151	114	737	435	113	908	303	285	665	303
Grp Volume(v), veh/h	214	0	0	219	0	0	131	0	0	190	0	0
Grp Sat Flow(s),veh/h/ln	1409	0	0	1286	0	0	1324	0	0	1253	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	2.9	0.0	0.0	1.6	0.0	0.0	2.5	0.0	0.0
Prop In Lane	0.19		0.11	0.15		0.34	0.16		0.23	0.33		0.24
Lane Grp Cap(c), veh/h	606	0	0	564	0	0	575	0	0	585	0	0
V/C Ratio(X)	0.35	0.00	0.00	0.39	0.00	0.00	0.23	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	1889	0	0	1751	0	0	1802	0	0	1739	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.2	0.0	0.0	6.4	0.0	0.0	5.9	0.0	0.0	6.2	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.3	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	0.4	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.6	0.0	0.0	6.8	0.0	0.0	6.1	0.0	0.0	6.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		214			219			131			190	
Approach Delay, s/veh		6.6			6.8			6.1			6.5	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		10.3		10.4		10.3		10.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		25.5		25.5		25.5		25.5				
Max Q Clear Time (g_c+I1), s		3.6		4.5		4.5		4.9				
Green Ext Time (p_c), s		0.7		1.2		1.1		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	36	136	21	30	101	67	19	72	27	57	73	41
Future Vol, veh/h	36	136	21	30	101	67	19	72	27	57	73	41
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
Heavy Vehicles, %	21	19	13	24	25	39	33	24	21	38	25	12
Mvmt Flow	40	151	23	33	112	74	21	80	30	63	81	46
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.4	11.2	10.6	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	19%	15%	33%
Vol Thru, %	61%	70%	51%	43%
Vol Right, %	23%	11%	34%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	193	198	171
LT Vol	19	36	30	57
Through Vol	72	136	101	73
RT Vol	27	21	67	41
Lane Flow Rate	131	214	220	190
Geometry Grp	1	1	1	1
Degree of Util (X)	0.216	0.332	0.334	0.313
Departure Headway (Hd)	5.94	5.568	5.471	5.938
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	604	645	658	606
Service Time	3.977	3.6	3.503	3.971
HCM Lane V/C Ratio	0.217	0.332	0.334	0.314
HCM Control Delay	10.6	11.4	11.2	11.7
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	0.8	1.5	1.5	1.3

Attachment B Enhanced Crossing Treatments

Enhanced Crossing Treatments

PEDESTRIAN CROSSING TREATMENTS

Pedestrian crossing facilities enable people to safely cross streets, railroad tracks, and other transportation facilities. Planning for appropriate pedestrian crossings requires the community to balance vehicular mobility needs with providing crossing locations along the desired routes of walkers. The following summarizes several enhanced pedestrian crossing treatments.

Unmarked Crosswalks

Under Oregon law, pedestrians have the right-of-way at all unsignalized intersections. On narrow, low-speed streets unmarked crosswalks are generally sufficient for pedestrians to cross the street safely, as the low-speed environment makes drivers more responsive to the presence of pedestrians. However, drivers are less likely to yield to pedestrians at unmarked crosswalks on high-speed and/or high-volume roadways, even when the pedestrian has stepped onto the roadway. In these situations, enhanced pedestrian crossing facilities are needed to remind drivers that they must yield when pedestrians are present.

Marked Crosswalks

Marked crosswalks are painted roadway markings that indicate the location of a crosswalk to motorists. Marked crosswalks can be accompanied by signs, curb extensions and/or median refuge islands, and may occur at intersections or at mid-block locations. Research has shown that marked crosswalks in certain situations do not improve pedestrian safety and can even make it worse. Recent research indicates that on multi-lane roadways (more than two lanes), marked crosswalks should not be installed without accompanying treatments, such as Rectangular Rapid Flash Beacons (RRFBs) or Pedestrian Hybrid beacons.

Rectangular Rapid Flashing Beacon (RRFB)

RRFBs are user-actuated amber lights that have an irregular flash pattern similar to emergency flashers on police vehicles. These supplemental warning lights are used at unsignalized intersections or mid-block crosswalks to improve safety for pedestrians using a crosswalk. RRFBs could be used at any unsignalized intersection or mid-block crossing where warrants require a higher level of crosswalk protection.

Pedestrian Hybrid Beacon

A Pedestrian Hybrid Beacon (sometimes called a HAWK) is a user-actuated signal that is unlit when not in use. It begins with a yellow light alerting drivers to slow, and then displays a solid red light requiring drivers to remain stopped while pedestrians cross the street. The beacon then shifts to flashing red lights to signal that motorists may proceed, after stopping, and after pedestrians have completed their crossing. A Pedestrian Hybrid Beacon can be used at mid-block crossings or, in some cases, at unsignalized intersections (the MUTCD suggests that the beacons be located at least 100-feet from an intersection). Pedestrian Hybrid Beacons could be used at any unsignalized intersection or mid-block crossing where warrants require a higher level of crosswalk protection.

Pedestrian Signal

Pedestrian signals provide pedestrians with a signal-controlled crossing at a mid-block location or, in some cases at a previously stop-controlled intersection where pedestrian volumes warrant full signalization (the MUTCD no longer allows half signals at intersections). The signal remains green for the mainline traffic movements until actuated by a pushbutton to call a red signal for traffic. They are typically located at midblock crossings with high pedestrian or bicycle demand and/or high traffic volumes, such as where shared-use paths intersect with roadways.

Pedestrian Countdown Heads

Pedestrian Countdown heads inform pedestrians of the time remaining to cross the street with a countdown timer at the signalized crossing. The countdown should include enough time for a pedestrian to cross the full length of the street, or in rare cases, reach a refuge island. The current Manual on Uniform Traffic Control Devices (MUTCD) requires all new pedestrian signals, and any retrofitted signals to include pedestrian countdown heads.

Leading Pedestrian Interval (LPI)

Leading pedestrian intervals allow pedestrians to start crossing the street at a signalized intersections five to seven seconds before conflicting vehicles are given a green light and allowed to enter the intersection. They are most commonly used at signalized intersections where left- or right-turning vehicles interfere with pedestrian crossing movements. LPI could be applied at all existing or potential future traffic signals to improve crossing conditions for pedestrians.

Geometric Considerations

There are a number of geometric enhancements that can be considered at pedestrian crossings that may be implemented in conjunction with previously discuss treatments.

Curb Extensions

Curb extensions create additional space for pedestrians at crosswalks and allow pedestrians and vehicles to better see each other. Curb extensions are typically installed at intersections and midblock crossings located along roadways with on-street parking to help reduce crossing distances and the amount of exposure pedestrians have to vehicle traffic. Curb extensions can narrow the vehicle path, slow down traffic, and prohibit fast turns. Curb extensions could be applied along any street where on-street parking is allowed or where there is sufficient shoulder width so the curb extension does not conflict with on-street bike lanes.

Raised Median Island

Raised median islands provide a protected area in the middle of the roadway where pedestrians can stop while crossing the street. Raised median islands allow pedestrians to complete two-stage crossings if needed. Raised median islands can narrow the vehicle path and slow down traffic along the roadway. Raised median islands could be applied along any street where they would not interfere with turning movements at driveways and intersecting roadways.

BICYCLE CROSSING TREATMENTS

Pavement Markings Through Intersections

Pavement markings can be extended through the intersection for bicyclists. Green paint can be used in "conflict zones" where vehicles and bicycles cross paths in intersections, at driveways, or at right-turn pockets. These pavement markings are typically used at signalized intersections to emphasize a connection in a larger bicycle network. They could be used at all signalized intersections and in other select "conflict zones".

Bike Box

Bicycle boxes are designated spaces at signalized intersections, placed between a set-back stop bar and the pedestrian crosswalk, that allow bicyclists to queue in front of motor vehicles at red lights. Bike boxes are typically used at signalized intersections to facilitate turn movements as well as other movements for cyclists.

Two-Stage Left-Turn Bike Box

Two-stage left-turn bike boxes allow bicyclists to safely and comfortably make left-turns at multilane intersections from a right-side bicycle lane or cycle track. Bicyclists arriving on a green light travel into the intersection and pull out into the two-stage turn queue box away from through-moving bicycles and in front of cross street traffic, where they can wait to proceed through on the side-street green signal. Two-stage left-turn bike boxes can be applied at signalized intersections to improve bicycle crossing conditions.

Bicycle Detection

Many traffic signals along are actuated, meaning that green indication is given to a movement when a vehicle is detected. However, actuating a signal as a cyclist can be difficult. Bicycle detection allows cyclists to actuate the traffic signal from the bicycle lane with a detector that is calibrated to recognize a bicycle. Pavement markings could be added to show cyclists where to stand to actuate a signal. Bicycle detection is typically applied at signalized intersections that accommodate bicycles and can be used at all of the signalized intersections to improve bicycle crossing conditions.

Bicycle Signal

Bicycle signals can be used at intersections to provide a separate signal phase that is dedicated to bicyclists. At this stage, the MUTCD does not allow bicycle signals to operation concurrent with permissive vehicle phases.

Attachment C Development Code Review

ATTACHMENT C: FLORENCE TSP CODE CONCEPTS

Date:	March 27, 2023
To:	Wendy Farley-Campbell, Shirley Gray, Erin Reynolds, Mike Miller, City of Florence Michael Duncan, Oregon Department of Transportation
From:	Darci Rudzinski, Clinton "CJ" Doxsee, and Brandon Crawford, MIG | APG
Project:	City of Florence Transportation System Plan Update
Subject:	Final Tech Memo #5, Attachment C: Florence TSP Code Concepts

Overview

This memorandum includes general recommendations for potential future code amendments, or "Code Concepts." The City should consider these Code Concepts as potential strategies to implement the strategies and recommendations from the Florence Transportation System Plan (TSP) update project. The Code Concept recommendations are also informed by a regulatory review, or "Code Audit," which evaluates the City's compliance with Oregon Administrative Rule (OAR) 660-012, or the Oregon Transportation Planning Rule (TPR). The TPR audit is included later in this memorandum (Table 2).

Land Use & Transportation Code Concepts

MULTIMODAL TRANSPORTATION, CONNECTIVITY, AND ACCESS STANDARDS

The TSP process recommends the City explore a number of transportation elements related to bicycle and pedestrian connectivity, transit improvements, intermodal route connectivity, and other improvements related to the City's multimodal network. The results of a regulatory review reveal that the City's Development Code currently includes a robust collection of standards and requirements related to bicycle, pedestrian, and transit access and connectivity. (See Table 2: Regulatory Review – TPR Audit, for details on the City's current multimodal standards and compliance with the TPR as it relates to multimodal requirements.) However, this code audit identifies a handful of improvements that would bring the City into closer compliance with State requirements. Specifically, the City should consider amending transportation-related conditions of approval criteria to include bicycle and pedestrian improvements. This change would strengthen the City's ability to implement and improve bicycle, pedestrian, and transit connectivity and access through future development approval.

Any other specific updates related to bicycle, pedestrian, and transit standards or requirements that emerge from the TSP recommendations should also be added to the list of possible Code amendments. The project team will evaluate the adequacy of existing standards and provide updates that will determine whether facility standards need amendments.

EMERGING TECHNOLOGIES

The City should explore requirements and standards for electric vehicle (EV) charging/parking facility requirements for new construction and possibly for redevelopment. Some cities in Oregon have adopted "EV ready" code requirements that are intended to enable future retrofits of on-site parking and utilities to include EV charging stations. In addition, cities are increasingly incorporating standards for EV facilities to take advantage of recent amendments to the state building code to include provisions for EV charging capacity for certain building types.[1] The City may consider applying EV charging requirements to developments that exceed size or trip generation thresholds based on Traffic Impact Study (TIS) findings. For example, the City of Portland is in the process of adopting code amendments as a part of their "EV Ready Code Project" that will include requirements for multi-family and mixed-use developments over a certain size to have a minimum percentage of their overall parking spaces be "EV Ready."[2] The City may also consider regulatory/code incentives for providing EV charging stations or EV-ready spaces, which could include minimum parking reductions in exchange for EV-ready spaces, or providing height or density bonuses for sites that provide EV spaces.

If Florence is interested in adopting EV facility standards, siting and design criteria that is specific to EV charging stations may also be beneficial. Examples of standards to explore include electricity/utility capacity, signage, accessibility, and EV-ready spaces to conventional parking spaces ratios. The American Planning Association (APA) offers extensive guidance and research on the topic of zoning for EV facilities. One of APA's recent publications provides a summary table of EV development standards from a sampling of jurisdictions throughout the country, as shown in Table 1.

Table 1: EV Parking Standards Throughout the Country

Jurisdiction	Multifamily Parking	Commercial Parking	Code Citation
Atlanta, GA	NA	20% of spaces must be EV-ready	Appendix B §101.8
Chicago, IL	20% of spaces must be EV-ready or EV-installed	20% of spaces must be EV-ready or EV-installed	§17-10-1011
Honolulu, HI	Buildings with 8+ spaces: 25% must be EV-ready	Buildings with 12+ spaces: 25% must be EV-ready	§32-1.1(20)
Issaquah, WA	10% of spaces must be EV-installed; 30% must be EV-ready	5% of spaces must be EV-installed; 10% must be EV-ready	§18.09.140
Madison, WI	2% of spaces must be EV-installed; 10% must be EV-ready (increases by 10% every 5 years)	1% of spaces must be EV-installed (increases by 1% every 5 years); 10% must be EV-ready (increases by 10% every 5 years)	§28.141(8)(e)
San Jose, CA	10% of spaces must be EV-installed; 20% must be EV-ready; 70% must be EV-capable	10% of spaces must be EV-installed; 40% must be EV-ready	§24.10.200
St. Louis, MO	2% of spaces must be EV-installed; 5% must be EV-ready (increases to 10% in 2025)	2% must be EV-installed; 5% must be EV-ready	§25.01.020-406.2.7
Washington, DC	Buildings with 3+ spaces: 20% must be EV-ready	Buildings with 3+ spaces: 20% must be EV-ready	§6-1451.03a

Select Findings from the 2022 Scan of EV Ordinances

[1] HB 2180 Enrolled. https://olis.oregonlegislature.gov/liz/2021R1/Measures/Overview/HB2180
[2] EV Ready Code Project: https://www.portland.gov/bps/planning/ev-ready

Source: *"Preparing for the Electric Vehicle Surge", American Planning Association, Zoning Practice*.

The City may consider other development standards to support emerging mobility and technology trends, such as siting and design standards for e-bike and e-scooter facilities. Such standards could follow a similar model as the EV charging requirements, standards, or incentives, such as requiring e-bike parking with charging ports for developments of a certain size (e.g., over 10,000 square feet, over a specified number of employees, over specified number of dwelling units, etc.).

OFF-STREET PARKING

To create a compact and visually appealing environment in the downtown area, the amount of space dedicated to parking should be minimized. By removing off-street parking requirements, the City can give business owners and developers flexibility and freedom to determine the amount and type of parking that will meet the needs of their clients. Removing off-street parking requirements can provide even more opportunity for future development or redevelopment. This could free up land currently used for parking lots to be developed over time into new buildings for business – an arguably more efficient use of valuable land. Removing off-street parking requirements does not mean that all off-street parking will go away, it simply allows the City and business owners to work together to meet the true parking needs of the Old Town district.

The City currently waives minimum parking requirements for changes of use in Old Town Subarea A that existed prior to October 2014. In addition, new construction (not including residential or lodging) may reduce off street parking by 50% of the minimum parking requirement. Although the minimum parking requirements in the Old Town district are relaxed compared to the rest of Florence, the City should still consider removing off-street parking minimums for both Old Town Subareas A and B altogether. As discussed, complete removal of off-street parking requirements will enable redevelopment of underutilized parking areas and would support a more walkable/bikeable, mixed-use environment.

The City's minimum off-street parking requirements are relatively consistent with requirements in other Oregon coastal communities. However, the City may consider reducing off-street parking requirements for single-family detached homes based on square footage or number of rooms to allow more flexibility for smaller units. For example, Lincoln City only requires one space per unit for dwellings under 1,000 square feet, and two spaces for any single-family dwellings over 1,000 square feet. In addition, Florence is currently considering reducing minimum parking requirements for duplexes to one space per unit and removing minimum parking for ADUs (as required by ORS 197.312). Consistent with parking requirements for duplexes, the City could also consider reducing minimum parking to one space per unit for other middle housing types (triplexes, quadplexes, townhomes), multi-family, and manufactured homes. These housing types generally provide housing for smaller households and tend to have lower vehicle-use rates than other large households and lower-density types of housing. Lowering off-street parking requirements can free up valuable land for more living space.3

LAND USE AND TRANSPORTATION COORDINATION

Development Code requirements, standards, and procedures are critical for ensuring the City's land uses and transportation system are thoughtfully coordinated. The City should consider

[3] Parking and Middle Housing https://www.oregon.gov/lcd/TGM/Documents/ParkingDemandsAcrossCities.pdf

Code amendments to improve integration of land use and transportation standards, practices, and procedures. The TPR includes specific requirements and guidance to ensure coordinated transportation and land use planning. For example, the City does not have any notice requirements that apply to transportation service providers and agencies. Proper notice allows transportation providers to offer input on how a proposed development could better address potential traffic or transportation-related impacts. Other examples for improved land use/transportation integration include ensuring consistency between land use/zoning amendments with TSP goals and policies, as well as allowing consolidated procedures for related land use and transportation proposals. The TPR Audit summarized below provides more details and recommendations related to land-use-transportation coordination amendments.

Regulatory Review (TPR Audit)

This section presents a review of applicable development ordinances from the City of Florence for compliance with the TPR. This section provides the intent, purpose, and requirements of the TPR, followed by a comprehensive review in the subsequent tables.

The purpose of the TPR is "*…to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided." The TPR also establishes requirements for coordination among affected levels of government for preparation, adoption, refinement, implementation, and amendment of transportation system plans.*

Specifically, Section -0045 of the TPR addresses implementation of the TSP. TPR Section -0060 (Plan and Land Use Regulation Amendments) specifies measures to be taken to ensure that allowed land uses are consistent with the identified function and capacity of existing and planned transportation facilities. Section -0060 establishes criteria for identifying the significant effects of plan or land use regulation amendments on transportation facilities, actions to be taken when a significant effect would occur, identification of planned facilities, and coordination with transportation facility providers.

In summary, the TPR requires that local governments revise their land use regulations to implement the TSP in the following manner:

- Amend land use regulations to reflect and implement the TSP.
- Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.
- Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors, and sites for their identified functions, through:
    - access management and control;
    - protection of public use airports;

  - coordinated review of land use decisions potentially affecting transportation facilities;
  - conditions to minimize development impacts to transportation facilities;
  - regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities; and
  - regulations ensuring that amendments to land use applications, densities, and design standards are consistent with the TSP.
- Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.
- Establish street standards that minimize pavement width and total right-of-way.

Table 2 provides an assessment of TPR compliance for the City based on adopted ordinances regulating land development. Each table lists TPR implementation requirements, an assessment of existing City code and regulatory provisions that meet the requirements, and recommendations for changes that will likely be needed to fully implement the new TSP and bring city regulations in compliance with the TPR. Recommended changes to local regulatory documents are intended to provide guidance to project staff during the update the City's TSP.

Table 2 provides a review of the following ordinances for the City of Florence:

- Public Ways and Property (Title 8)
- Zoning Regulations (Title 10)
- Subdivision Regulations (Title 11)

Table 2: Regulatory Review – TPR Audit

Oregon Revised Statutes	Comments & Recommendations
OAR 660-12-0045	
(1) Each local government shall amend its land use regulations to implement the TSP.	
(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	The purpose of this provision is to allow for certain transportation uses, such as operation, maintenance, and repair of transportation facilities identified in the TSP, without being subject to land use regulations. Per FCC 10-2-12, the City permits the following uses and activities in all zones without review: Operation, maintenance, and repair of public roads and highway facilities and existing transportation facilities identified in the TSP Construction of facilities and improvements identified in the TSP or Public Facility Plan Changes to transit or airport services

Oregon Revised Statutes	Comments & Recommendations
consistent with clear and objective dimensional standards; (C) Uses permitted outright under ORS 215.213(1)(j)–(m) and 215.283(1)(h)–(k), consistent with the provisions of OAR 660-012-0065; and (D) Changes in the frequency of transit, rail and airport services.	**Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.
(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;	See responses to -0045(1)(a)
(c) In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or to concern the application of a comprehensive plan or land use regulation and to be subject to standards that require interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is consistent with OAR 660-012-0050. To facilitate implementation of the TSP, each local government shall amend its land use regulations to provide for consolidated review of land use decisions required to permit a transportation project.	This TPR Section references project development and implementation - how a transportation facility or improvement authorized in a TSP is designed and constructed (660-012-0050). 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, 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. FCC 10-1-1-6-2.D and -3.B establish public notice requirements for Type II and Type III land use decisions. These provisions require notice to be sent to ODOT for any proposal located adjacent to a state roadway or that is expected to have an impact on a state transportation facility. FCC 10-1-1-5.B allows for consolidated proceedings when an applicant applies for more than one type of land use or development permit for the same or multiple parcels of land. **Recommendation:** The City should add provisions to FCC to 10-1-1-6-2.D and -3.B to include notice requirements to all transportation providers whose facilities may be impacted by a land use decision, including County facilities and the regional transit provider.
(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	FCC Chapter 10-36 – Public Facilities – includes provisions for access control measures, including:

Oregon Revised Statutes	Comments & Recommendations
consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;	Intersection spacing (FCC 10-36-2-13) Right-of-way widths for functional street classifications and specific corridors (FCC 10-36-2-5) Traffic signals and roundabouts (FCC 10-36-2-11) Medians (FCC 10-36-2-12) All newly created lots must have street frontage and approved street access (FCC 10-36-2-1) FCC 10-35-2-7 establishes spacing standards between driveways and intersections. The City does not have minimum spacing requirements specific to driveways alone. Requirements that regulate driveway, street, and intersection spacing are not provided in City ordinances. Recommendation: The TSP process will assess the adequacy of existing standards to meet current and future needs and may result in new or updated roadway and access management standards. The City should also amend FCC 10-35-2-7 to include minimum spacing between driveways based on street functional classification. Street Improvement Standards will need to be made consistent with TSP standards.
(b) Standards to protect future operation of roads, transitways and major transit corridors;	FCC 10-1-1-4.E outlines the criteria for when a Traffic Impact Study may be required. Per this FCC section, Traffic Impact Studies are intended to determine capacity and safety impacts from a particular development proposal, whether the development will meet City transportation standards for capacity and safety, to mitigate anticipated impacts, and to implement applicable TPR regulations. FCC 10-35-2-5 establishes Traffic Study standards, which includes the required components of a Traffic Impact Study and authorizes the City to include conditions of approval. **Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.
(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;	FCC 10-21-1 establishes the Airport Development District, which is intended to encourage and support the operation of the City's airport by allowing aviation-compatible uses. FCC 10-21-2, the Public Use Airport Safety and Compatibility Overlay Zone, is intended to establish safety standards to promote air navigation safety and reduce potential hazards to land uses near the airport. This Section includes provisions for the Airport Imaginary Surfaces, Airport Noise Impact Boundary,

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	and the Airport Secondary Impact Area. These provisions require land uses within these zones to be compliant with applicable Federal Aviation Administration (FAA) requirements. **Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.
(d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;	See response to -0045(1)(c).
(e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;	FCC 10-36-1.E authorizes the City to require improvements to public facilities as a condition of development approval, provided the improvements are roughly proportional to the impact of the development on the facilities. FCC 10-35-2-5 – Traffic Study Requirements – authorizes the City to require conditions of approval in order for a development proposal to meet operations and safety standards consistent with the planned transportation system. The provision states that conditions of approval may include, but are not limited to the following: Crossover/reciprocal easement agreements for all adjoining parcels to facilitate future access Access adjustments where proposed access points do not meet access spacing standards Right-of-way dedications for future improvements Street improvements Turn restrictions FCC 10-35-2-6 authorizes the city to require consolidation of vehicle access points, recording of reciprocal access easements, installation of traffic control devices, and other mitigation measures as a condition of approval to land use approval to ensure safe and efficient operation of the City's transportation system. **Recommendation:** Existing code provisions meet the TPR requirement. However, the City should consider specifying that transportation-related conditions of approval may include bicycle and pedestrian improvements.
(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;	FCC 10-1-1-6-2.D requires notice of any Type II decision to the airport, per ORS 227.175 and FCC 10-21-2-4, as well as any governmental agency entitled to notice under an intergovernmental agreement. This provision also requires notice be provided to ODOT for proposals adjacent to or expected to have an impact on state roadways.

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(C) Other applications which affect private access to roads; and (D) Other applications within airport noise corridors and imaginary surfaces which affect airport operations; and	Per FCC Table 10-1-1, Subdivisions and Partitions are Type II procedures, and therefore they require notice to ODOT if they are adjacent to or expected to have an impact on state roadways. FCC 10-1-1-6-3.B requires notices for quasi-judicial land use hearings (Type III decision) to the airport, per ORS 227.175 and FCC 10-21-2-4, as well as any governmental agency entitled to notice under an intergovernmental agreement. This provision also requires notice be provided to ODOT for proposals adjacent to or expected to have an impact on state roadways. FCC 10-21-2-4 requires notice for any land use decision to the airport sponsor and the Department of Aviation for any land use decision within the Public Use Airport Zone. FCC 10-1-1-6-4.D requires notice to any affected government agency of a hearing for a Type IV decision, which may include transportation agencies. **Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.
(g) 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.	FCC 10-1-2 establishes rules and procedures for zoning map amendments, and FCC 10-1-3 provides rules and procedures for zoning and comprehensive plan amendments. Neither section requires that amendments must be consistent with transportation facility functions, capacities, or performance standards as identified in the TSP. **Recommendation:** Add language to FCC 10-1-2 and 10-1-3 that ensures zoning map and ordinance amendments are consistent with the planned transportation system. See recommendations for TPR Section -0060.
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.	
(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;	FCC 10-3-10 establishes bicycle parking requirements. Bicycle parking is required for all non-residential uses at a rate of one space per every ten off-street vehicle spaces. Bicycle parking is required for triplexes, quadplexes, cluster housing, and multi-family housing at a rate of 1 space per 3 units, and bicycle parking is required at a rate of 1 space per

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	20 bedrooms for group living and 1 space per 8 bedrooms for dormitories. **Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.
(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	FCC 10-35-3-2 – Site Design and Layout – requires all developments to provide a continuous pedestrian system. These provisions include requirements for pedestrian walkway systems to connect to all future phases of development, existing or planned adjacent off-site trails, adjacent public parks or open space, and previously reserved public access easements on neighboring properties. These provisions also require developments to include safe, direct, and convenient walkways and pedestrian connections that are within the development site. Provisions for internal pedestrian connections also include requirements for walkway connections for all on-site parking areas, and the City may also require raised walkways for parking areas with 80 or more parking spaces. FCC 10-35-4 requires proposed developments within a quarter mile of an existing or proposed transit stop to demonstrate a pedestrian route from building entrances to the transit facility or to the nearest public right-of-way that provides access to the transit facility. FCC 10-36-2-5 includes cross section requirements for each street functional classification in the city. Bike lanes or bike sharrows are required for collectors and other specific street segments, such as portions of Munsel Lake Road, Rhododendron Drive, and Heceta Beach Road. Sidewalks are required along all streets and roads in the city. Per FCC 10-36-2-6, cul-de-sacs are allowed only when environmental or topographical constraints, existing development, or conflicting City requirements preclude street extensions or through circulation. FCC 10-35-2-7 establishes spacing standards between driveways and intersections. FCC 10-36-2-9.C allows mid-block connections and multi-use paths in lieu of street connections and authorizes the City to require multi-use paths off cul-de-sacs to provide bicycle and pedestrian connections to adjacent development or paths. **Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.

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now or in the future considering the potential for redevelopment; or (iii) Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection.	
(c) Where off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle travel, including bicycle ways along arterials and major collectors; [Note: Subsection (d) defines safe and convenient]	See response to Section -0045(2)(e).
(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.	FCC 10-35-3-2 – Site Design and Layout – requires all developments to provide a continuous pedestrian system. These provisions include requirements for pedestrian walkway systems to connect to all future phases of development, existing or planned adjacent off-site trails, adjacent public parks or open space, and previously reserved public access easements on neighboring properties. These provisions also require developments to include safe, direct, and convenient walkways and pedestrian connections that are within the development site. Provisions for internal pedestrian connections also include requirements for walkway connections for all on-site parking areas, and the City may also require raised walkways for parking areas with 80 or more parking spaces. **Recommendation:** Existing Ordinance provisions meet this TPR requirement. No further changes to the code are recommended.
(6) In developing a bicycle and pedestrian circulation plan as required by OAR 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 will make recommendations to the bicycle and pedestrian plan that are consistent with TPR -0020. This TPR requirements is currently addressed in the following areas: Bicycle/pedestrian connection between cul-de-sacs and adjacent streets. See response to section -0045(3)(b) Site design criteria that create pedestrian paths – see response to section -004(3)(b) **Recommendation:** This TPR requirement will be addressed by the TSP planning process, which will identify pedestrian and bicycle improvements for inclusion in the TSP and is met by requiring improvements in developing areas consistent with adopted code provisions.

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(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Notwithstanding section (1) or (3) of this rule, local street standards adopted to meet this requirement need not be adopted as land use regulations.	FCC 10-36-2-5 includes cross section requirements that include minimum right-of-way width for functional classification. There are no minimum right-of-way width standards for Arterial streets in the Code. Recommendation: The TSP process will revisit adopted roadway cross-sections and design requirements, keeping in mind that the TPR requires that cities minimize pavement width and total right-of-way consistent with the operational needs of the facility. At a minimum, the City should adopt right-of-way width and cross-section design standards for general arterial development in addition to the existing standards that are specific segments of existing roads. Standards should be made consistent between the TSP and Street Improvement Standards.
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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.	FCC 10-1-3 authorizes amendments to zoning district boundaries and zoning regulations. The approval criteria do not contain specific requirements that ensures proposed amendments are consistent with planned facilities within the adopted TSP. Recommendation: FCC 10-3-1 should add provisions that address plan amendment consistency with transportation facilities.