Section 6 Transportation Options Analysis

6 TRANSPORTATION OPTIONS ANALYSIS

This section presents multimodal improvement options available to the City of St. Helens to address existing and future transportation system deficiencies. The options presented in this section include strategies to improve system operations, manage travel demand, and to provide multimodal facilities to improve capacity and connectivity.

The options are grouped into three packages. The first package ("Complete Streets Options") is limited to connectivity and street improvements that do not require major capital investments. The second package includes a majority of the recommendations from the 1997 Transportation System Plan (TSP). The third package includes elements identified in the 2009 Lower Columbia River Rail Corridor Plan. The transportation options included in each package are later evaluated as potential improvement projects for the City.

It is important to recognize that none of the packages evaluated in this section fully address the community's long-term transportation system needs on their own. As such, the final TSP documented in Section 7 was developed based on a combination of improvement projects based on community feedback and guidance received during the options analysis. Additional information related to the options analysis, including details on the operations analyses performed for each solutions package, is included in Technical Memorandum 5: Transportation Solutions, which is provided in the Volume 2 Technical Appendix.

Complete Streets Option

The Complete Streets Option seeks to improve the future transportation system through completion of existing facilities. No new intersection capacity-based improvements are included with this option. As a result, the intersections identified in Section 5 as operating unacceptably under the No Build Option will continue to operate unacceptably under the Complete Streets Option.

The Complete Streets option is organized as follows:

- Pedestrian System Improvements
- Bicycle System Improvements
- Multi-use Path System Improvements
- Transit System Improvements

- Potential Roadway Functional Classification Plan Revisions
- Potential Roadway Cross Section Standard Revisions

The Complete Streets Option includes many of the Transportation Demand Management (TDM) strategies recommended in the 1997 TSP, including many of the recommended pedestrian and bicycle facility improvements. Many new pedestrian and bicycle projects identified throughout the current TSP update process are included as well.

Pedestrian System Improvements

The pedestrian system within St. Helens includes sidewalks, multi-use paths, and trails as well as marked and unmarked, signalized and unsignalized pedestrian crossings.

TYPES OF PEDESTRIAN IMPROVEMENTS

The potential pedestrian improvement projects identified for St. Helens have been separated into two categories: sidewalks and pedestrian crossings. The sidewalk improvement projects include installing sidewalks on one or both sides of an existing roadway to improve connections between residential areas and schools, transit stops, or employment areas as well as to fill in gaps in the pedestrian system. Some sidewalk projects require additional right-of-way acquisition and thus additional cost.

The pedestrian crossing improvement projects include a variety of potential treatments that could be implemented at key intersections and along corridors in St. Helens. A summary of these treatments, including advantages, challenges, and location considerations are presented below.

Leading Pedestrian Interval

Leading Pedestrian Intervals at signalized intersection allow pedestrians to begin crossing at a crosswalk before conflicting vehicles start moving. For example, left or right-turning vehicles may have a red light for five to seven seconds while pedestrians and through vehicles are allowed to begin moving through the intersection.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Minimal staff time for signal re-timing ▪ Reduces vehicle/ pedestrian conflicts ▪ Improves driver yielding	▪ Reduces green time for conflicting vehicles ▪ Right-turn-on-red is often prohibited	▪ Signalized intersections with heavy turning volumes

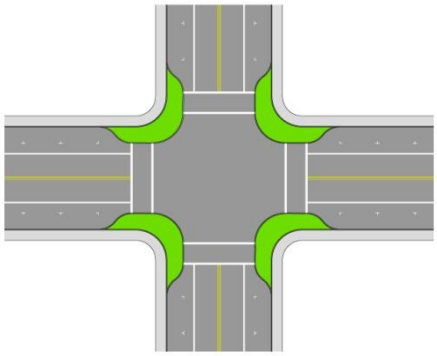
Pedestrian Countdown Signals

Pedestrian Countdown Signals 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 2009 Manual on Uniform Traffic Control Devices (MUTCD) requires all new pedestrian signals, and any retrofitted signals to include pedestrian countdown signals.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Complies with 2009 MUTCD ▪ Fewer pedestrians crossing the street late in countdown ▪ Fewer pedestrian left in crosswalk during steady don't walk phase	▪ None	▪ Signalized intersections without countdown heads

Curb Extensions

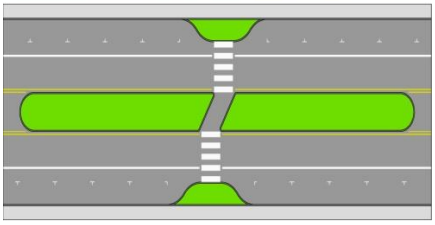
Curb extensions create additional space for pedestrians and allow pedestrians and vehicles to better see each other at crosswalks. Curb extensions are typically installed at intersections along roadways with on-street parking and help reduce crossing distances and the amount of exposure pedestrians have to vehicle traffic. Curb extensions can narrow the vehicle path, slow down traffic, and prohibit fast turns.



ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Shorter crossing distances for pedestrians ▪ Reduces motorist turning speeds ▪ Increased visibility between motorists and pedestrians ▪ Enables permanent parking ▪ Enables tree and landscape planting, and water runoff treatment	▪ Can only be used on streets with unrestricted on-street parking ▪ Physical barrier can be exposed to traffic ▪ Greater cost and time to install than high visibility crosswalks ▪ May require changes to roadway drainage system in retrofit applications	▪ Streets with on-street parking

Raised Median Islands

Raised median islands provide a protected area in the middle of a crosswalk for pedestrians to stop while crossing the street. The raised median island allows pedestrians to complete a two-stage crossing if needed. The ODOT Traffic Manual states that for state highways a raised median, in combination with a marked crosswalk, is desired when average daily traffic (ADT) volumes are greater than 10,000 vehicles per day, such as on US 30.



ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Reduces the number of crashes at marked and unmarked crosswalks ▪ Preferred on multi-lane streets ▪ Requires shorter gaps in traffic to cross the street ▪ Used to create entry point into area of high pedestrian activity	▪ Must have at least 6 feet of space to accommodate wheelchairs; not all streets will have adequate space ▪ Physical barrier in the street	▪ Areas with high volume traffic conflict or high pedestrian crash locations

Rectangular Rapid Flashing Beacon

Rectangular Rapid Flashing Beacons, or 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.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Typically increases motorists yielding behavior ▪ Warning information to drivers at eye level ▪ May be used at unsignalized intersections and mid-block crossings ▪ May be installed on two-lane or multi-lane roadways ▪ Low-cost alternative to traffic signals and hybrid signals	▪ Motorists may not understand flashing lights ▪ Pedestrians may not activate flashing light	▪ Areas with high mid-block crossings

Pedestrian Hybrid Signal

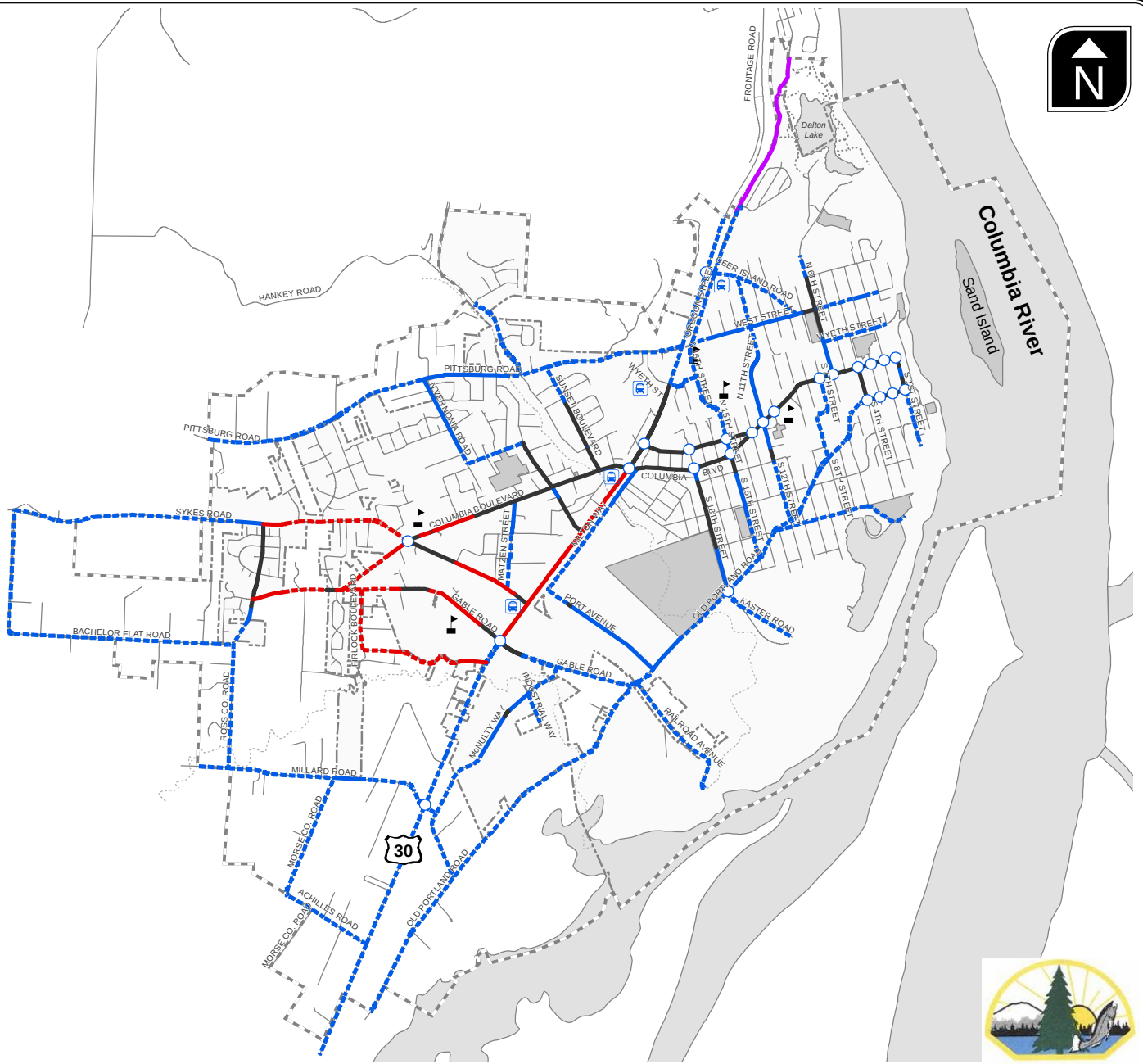
A pedestrian-actuated hybrid signal stops traffic on the mainline to provide a protected crossing for pedestrians at an unsignalized location. Warrants for the installation of pedestrian-actuated hybrid signal are based on the number of pedestrian crossings per hour (PPH), vehicles per hour on the roadway, and the length of the crosswalk. Thresholds are available for two types of roadways: locations where prevailing speeds are above 35 miles per hour (mph) and locations where prevailing speeds are below 35 mph.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ A very high rate of motorists yielding to pedestrians ▪ Drivers experience less delay at hybrid signals compared to other signalized intersections	▪ Expensive compared to other crossing treatments ▪ Requires pedestrian activation	▪ Larger roadways where mid-block crossing is difficult or crossing. opportunities are limited (e.g., Columbia Blvd.)

PROPOSED PEDESTRIAN SYSTEM IMPROVEMENTS

Figure 6-1 illustrates the location of the pedestrian improvement projects proposed as part of the Complete Streets Option. The roadway segments shown as solid lines involve the addition of a sidewalk to one side of the street (completing the pedestrian facilities as a sidewalk is already present on the other side of the road), while the roadway segments shown as dashed lines involve the addition of sidewalks on both sides of the street. The segments shown in red represent locations with a higher priority for pedestrian facilities based on City staff and community feedback.

Many of the proposed sidewalk improvement projects identified in Figure 6-1 require widening the roadway (and, in some cases, additional right-of-way) to accommodate the new facilities. Additional right-of-way requirements were not evaluated as part of the options analysis and are not reflected in the cost estimates for each project.



LEGEND

Critical Needs

- Add Sidewalks to One Side
- Add Sidewalks to Both Sides

Additional Needs

- Add Sidewalks to One Side
- Add Sidewalks to Both Sides
- Existing Sidewalks
- Existing Shared-Use Paths
- Improve Pedestrian Crossing
- Transit Stop
- Schools
- City UGB
- City Limits

PROPOSED PEDESTRIAN IMPROVEMENT PROJECTS
ST. HELENS, OREGON

FIGURE
6-1

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Bicycle System Improvements

The bicycle system within St. Helens includes bicycle lanes, shared roadways, and multi-use paths. Multi-use path improvements are discussed in a subsequent section because of their utility for both pedestrians and bicyclists.

TYPES OF BICYCLE IMPROVEMENTS

The bicycle improvement projects identified for St. Helens have been separated into three categories: bicycle lanes, bicycle crossings, and off-road facilities.

Shared Roadways

Any roadway without a dedicated bicycle facility is generally considered a shared roadway. Where traffic volumes are low, shared roadways are generally safe and comfortable facilities for cyclists. However, the ODOT Bicycle and Pedestrian Plan does not recommend shared roadways where automobile volumes or vehicle speeds are high. Thresholds for where shared-lanes are appropriate are based on several factors, including land-use and grade. Generally, bike lanes are preferred on most roadways with greater than 3,000 average daily trips or with a speed limit greater than 25 miles per hour. For these roadways, dedicated bicycle facilities, typically bicycle lanes, are recommended.

Shared-lane Pavement Marking

Shared-lane pavement markings (often called “sharrows”) are a tool designed to help accommodate bicyclists on roadways where bicycle lanes are desirable but infeasible to construct. The sharrow marking indicates a shared roadway space, and are typically centered approximately four feet from the edge of the travelway to encourage cyclists to ride further away from parked and parking cars and/or the curb. Typically, sharrows are suitable on roadways with fewer than 3,000 average daily trips. For reference, Millard Road carries this level of traffic today.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Reduce wrong-way and sidewalk riding ▪ Improves cyclists positioning in the roadway ▪ Informs motorists of bicyclists ▪ Used on streets without adequate space for bike lane markings	▪ Pavement marking maintenance ▪ Not as effective as a bike lane	▪ Streets with moderate speeds and traffic volumes, and where space for bike lane markings is limited

Bicycle lanes

Bicycle lanes are striped lanes on the roadway dedicated for the exclusive use of bicycles. Typically, bicycle lanes are placed at the outer edge of pavement (but to the inside of right-turn lanes and/or on-street parking). Bicycle lanes improve bicycle safety, improve cyclist security, and (if comprehensive) can provide direct connection between origins and destinations. However, inexperienced cyclists often feel uncomfortable riding on busy streets, even when they include bicycle lanes. City of St. Helens street standards currently include bicycle lanes on all arterial and collector streets.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Improves safety and comfort by increasing the visibility and awareness of cyclists ▪ Provides facilities for bicyclists	▪ May still have conflicts with motorists (e.g, dooring) ▪ Motorists may illegally park in bike lane	▪ Non-local streets with adequate space for accommodation

Bicycle Detection

Many traffic signals in St. Helens are actuated, meaning that green indications are only given to a movement when the signal detects the presence of a vehicle. However, actuating a signal as a cyclist is difficult if there is no information about the location of detection equipment. Pavement markings should be used, including actuated left-turn lanes, to show cyclists where to stand to actuate a signal. Additionally, the sensitivity of all loop detectors should be set to allow for bicycle activation.

OFF-STREET FACILITIES

Bicycle Parking

Bicyclists also benefit from several other types of bicycle support facilities, such as secure bicycle parking, either open or covered U-shaped racks, and storage lockers for clothing and gear. Areas that typically provide secured bicycle parking are often located at areas of high bicycle and pedestrian traffic such as transit stations, shopping centers, schools, and multi-use trails. The City currently requires bicycle parking included in all new commercial development as a condition of approval. Columbia County Rider buses are outfitted with bicycle racks that allow cyclists to bring their bikes with them on transit. Allowing bicycles on transit vehicles increases the range of trips possible by both transit and bicycling, and reduces cyclists' fears of being stranded in the event of a mechanical or physical breakdown.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Provides a secure location to store and lock bicycles ▪ Locations are generally very close to and visible from the point of interest ▪ Relatively inexpensive and easy installation ▪ Encourages community bicycle use	▪ Requires space in potentially busy area ▪ May remove an on-street parking space	▪ Bicycle parking could be either implemented or expanded at areas of high bicycle ridership and pedestrian traffic (e.g., busy bus stops, shopping centers, libraries, schools, etc.)

Wayfinding Signs

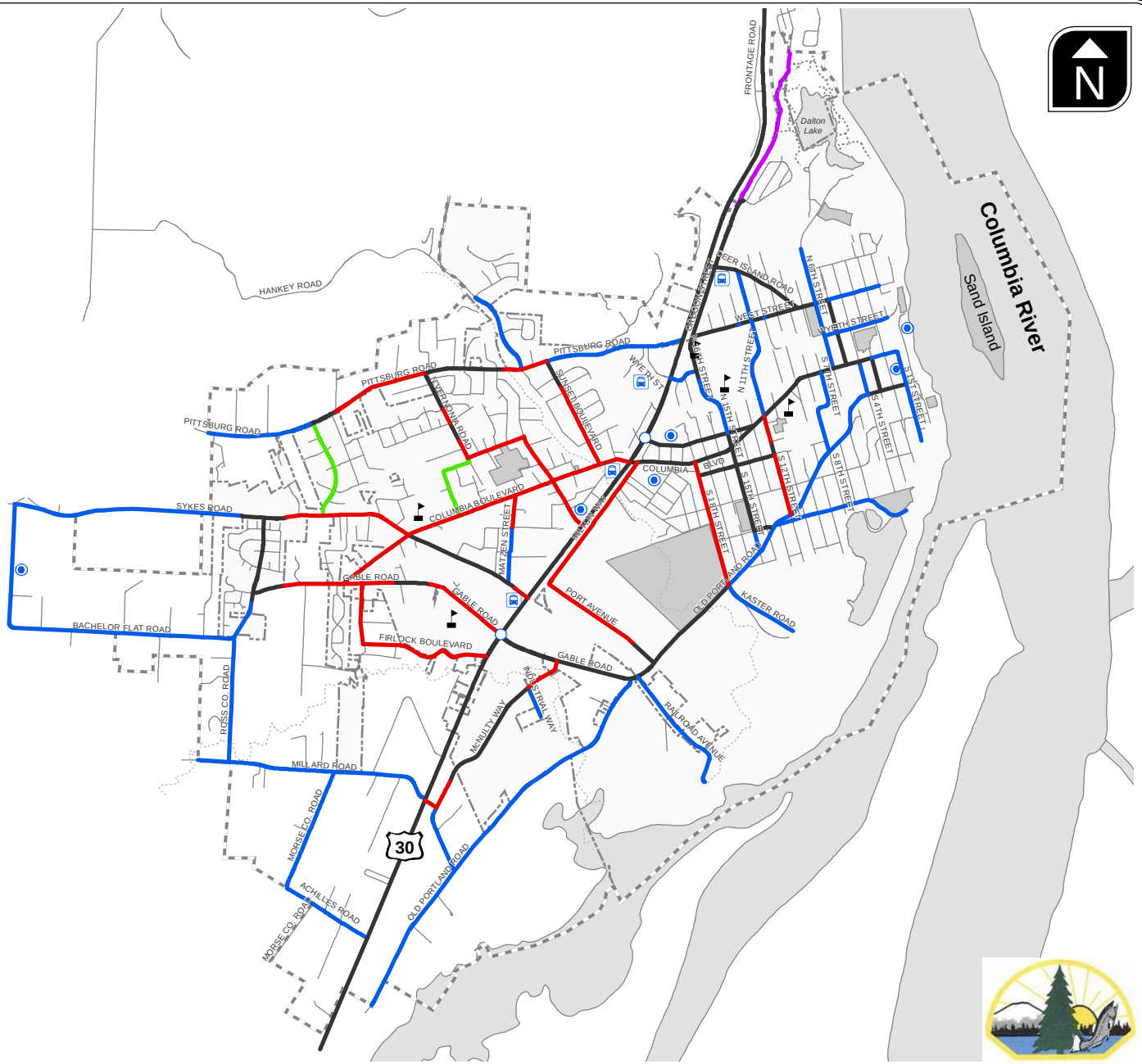
Wayfinding signs direct pedestrians and bicyclists towards destinations in the area. They typically include distances and average walk/cycle times.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Eases navigation for residents and visitors by bicycle ▪ Provides guidance to destinations from streets and along multi-use trails ▪ Offers another indication to motorists of the presences of bicycles	▪ Maintenance and vandalism	▪ Areas adjacent to bicycle and pedestrian facilities

PROPOSED BICYCLE SYSTEM IMPROVEMENTS

Figure 6-2 illustrates the location of the bicycle improvement projects proposed as part of the Complete Streets Option. The roadway segments shown as thick red and blue lines involve the installation of bicycle lanes, while the roadway segments shown as thick green lines involve the installation of sharrows along the roadway. The roadway segments shown in red were identified as locations with a higher priority for bicycle facilities by City staff, the St. Helens Pedestrian and Bicycle Committee, and by the general public. The blue dots shown on the map represent areas where bicycle parking is recommended based on recommendations in the 1997 TSP as well as the location of Columbia County Rider park and ride and transit facilities.

Many of the proposed bicycle improvement projects identified in Figure 6-2 require widening the roadway and potentially additional right-of-way to accommodate the new facilities. Additional right-of-way requirements were not evaluated as part of the options analysis and are not reflected in the cost estimates for each project.



LEGEND

Critical Needs

- Add Bike Lanes

Additional Needs

- Add Bike Lanes
- Add Sharrows
- Existing Bike Lanes
- Add Bicycle Parking
- Improve Bicycle Crossing
- Transit Stops
- Schools
- City Limits
- City UGB

PROPOSED BICYCLE IMPROVEMENT PROJECTS
ST. HELENS, OREGON

FIGURE
6-2

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Multi-Use Paths and Trails

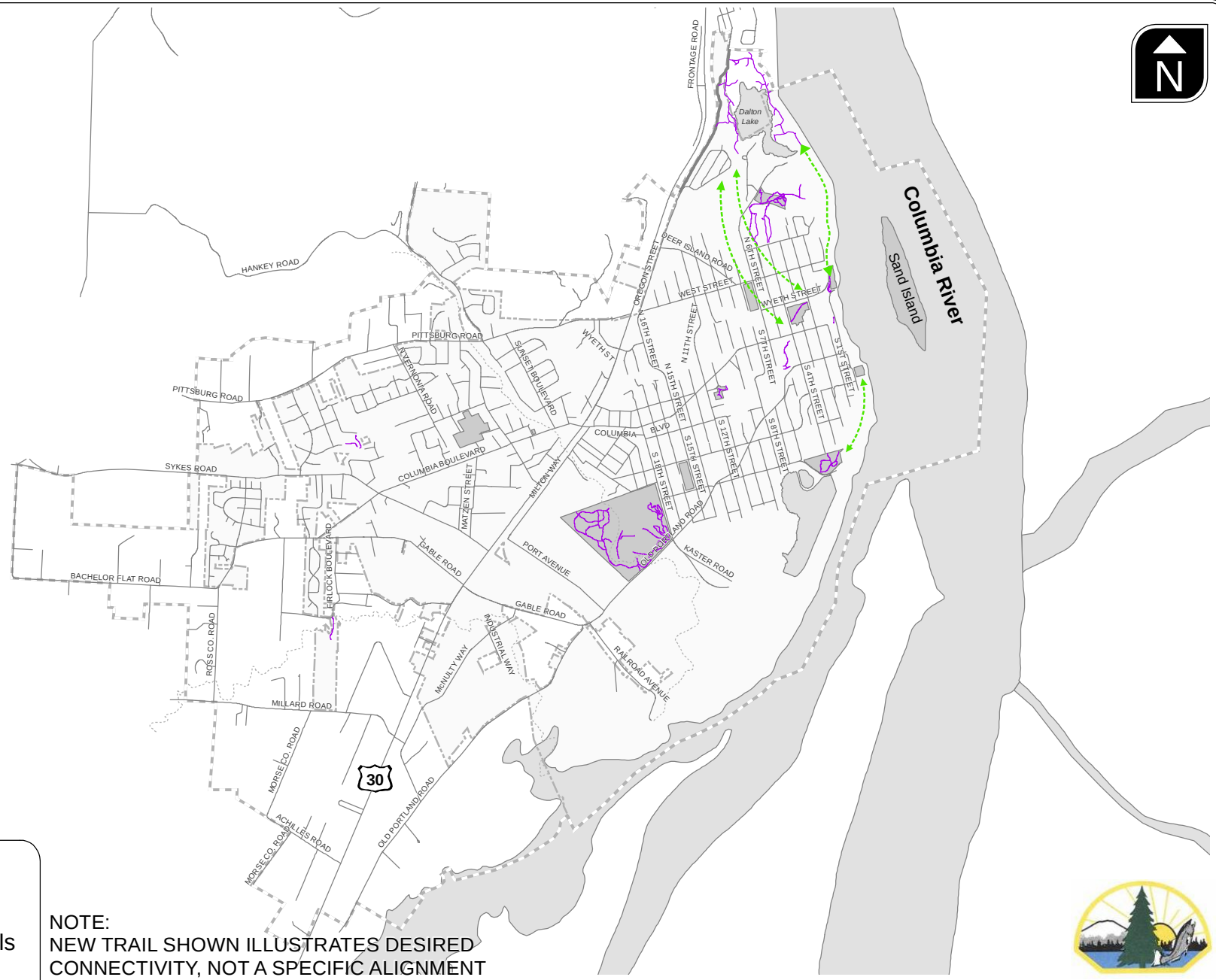
There are several multi-use paths and trails in St. Helens dedicated to pedestrians and bicyclists. These paths and trails have an integral role in recreation, commuting, and accessibility for residents. Rutherford Parkway is among the many paths and trails located within the City. It offers a paved, multi-use path extending north from Oregon Street to Columbia City. Rutherford Parkway also connects into the Dalton Lake Recreational Area, which includes a system of trails around Dalton Lake.

There are several other multi-use paths and trails throughout the city as well as new trail systems in various stages of planning and construction that can and will help provide short, local connections. Multi-use paths and trails can provide numerous benefits including:

- providing children and seniors with a safe, off-street alternatives to substandard roadways with no bike lanes, shoulders, or sidewalks;
- providing a safe, traffic-free path for walkers, joggers, cyclists, and others to exercise and enjoy the outdoors;
- supporting downtown economic development by providing an off-street transportation route to downtown businesses; and
- providing direct, non-motorized access to bus stops.

ADVANTAGES	CHALLENGES	LOCATION TYPE
▪ Separates bicyclists from vehicle traffic ▪ Combination of pedestrians and bicyclists requires less space than separate facilities for each	▪ Needs adequate space to accommodate buffer from street and width to allow the passing of bicyclists and pedestrians ▪ Bicycle and pedestrian conflicts ▪ Unsafe in highly urban areas or along roads with driveways	▪ Create new links to and expansion of Rutherford Parkway

Figure 6-3 illustrates the connectivity sought through a variety of potential trail improvement projects suggested as part of the Complete Streets Option. The trail improvement projects involve the installation of trails that connect the Dalton Lake trail system to the local street system and the downtown waterfront area per recommendations in the Conceptual Draft Dalton Lake Recreational Plan and the City's Waterfront Development Plan. Both plans include provisions for pedestrian access to waterfront areas through the development of a continuous trails system. The alignment of, and right-of-way required for, such trails would need to be further refined and may incorporate use of existing sidewalks as well as integration with roadway and intersection improvements.



LEGEND

- Add Trail
- Existing Trails
- City UGB
- City Limits

NOTE:
NEW TRAIL SHOWN ILLUSTRATES DESIRED CONNECTIVITY, NOT A SPECIFIC ALIGNMENT

PROPOSED TRAIL IMPROVEMENT PROJECTS
ST. HELENS, OREGON

FIGURE
6-3

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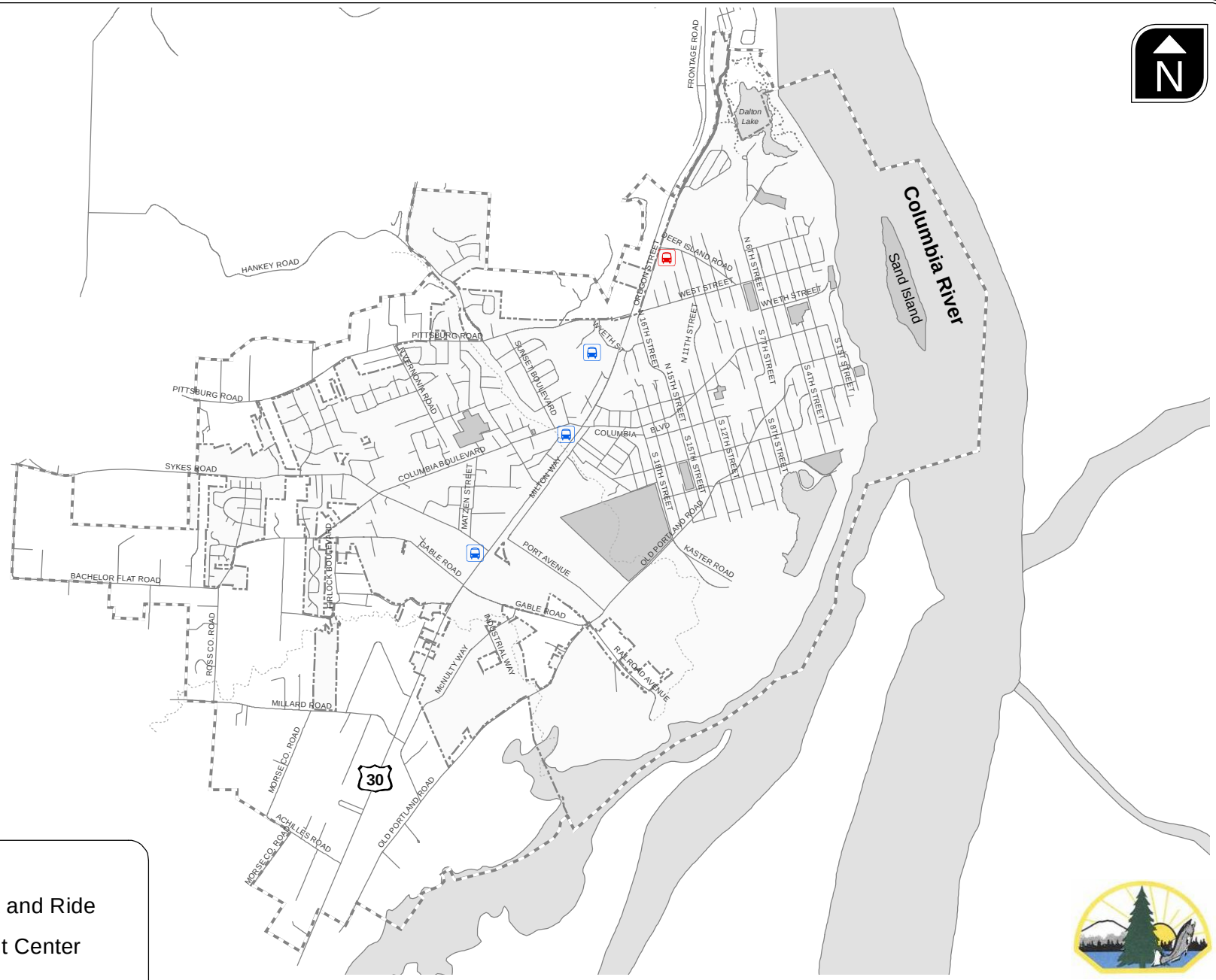
In addition to enhancing trails, the City continues to explore potential future river access to Sand Island. The possibility of some form of boat shuttle service has been considered, but no plans for implementation are currently underway.

Transit System Improvements

Columbia County completed a Transit Access Plan in 2009 that included the identification of specific transit improvements within St. Helens. The transit system improvements include the location and design of future transit stops and an evaluation of existing and future conditions at each stop. The recommendations were previously vetted through a community outreach process and are adopted by the County. As such, the City of St. Helens agreed to formally incorporate the recommendations into the TSP update. Figure 6-4 illustrates park and ride lots and a proposed transit center location within St. Helens. Further details about the individual adopted projects are included in Section 7.

Potential Functional Classification Plan Revisions

The City of St. Helens classifies roadways as major arterials, minor arterials, collectors, or local streets. Most of the City's functional classification designations are maintained as part of this update. However, it was observed that some streets designated as minor arterials have a considerable number of residential properties fronting the street where high traffic speeds and volumes may be undesirable and arterial access spacing standards are inappropriate. While these roadways should maintain an ability to distribute traffic between major arterials, collectors, and local streets, a lower functional classification may be more appropriate based on existing conditions. Other roadways have too low of a designation based on the form and function of the roadway. Table 6-1 summarizes proposed functional classification revisions and Figure 6-5 illustrates the proposed Functional Classification Plan.



LEGEND

- Existing Park and Ride
- Future Transit Center
- City Limits
- City UGB

EXISTING BUS STOP AND PROPOSED TRANSIT CENTER LOCATIONS
ST. HELENS, OREGON

FIGURE **6-4**

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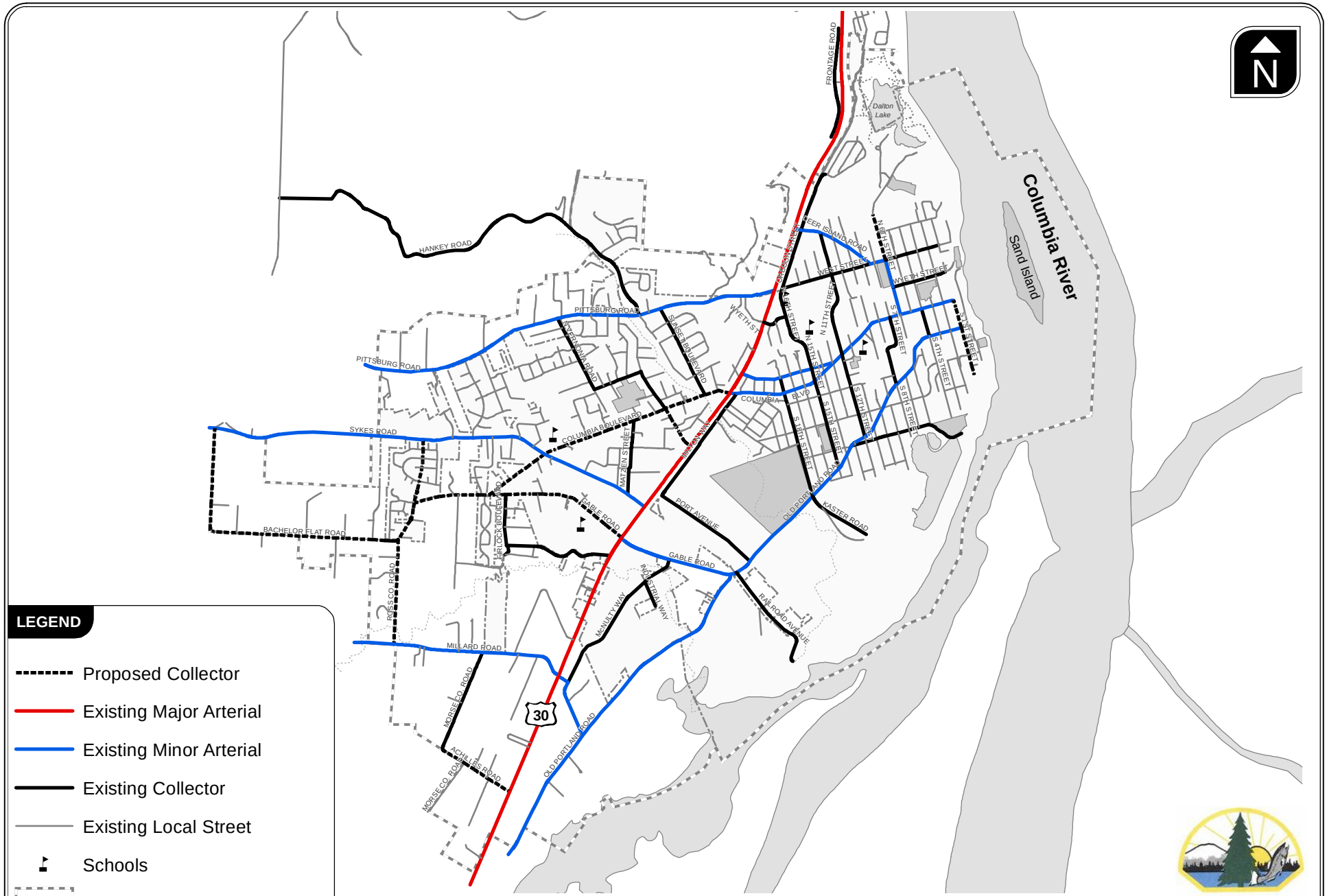

PROPOSED FUNCTIONAL CLASSIFICATION PLAN
ST. HELENS, OREGON

FIGURE **6-5**

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TABLE 6-1: PROPOSED FUNCTIONAL CLASSIFICATION CHANGES

Roadway	1997 TSP	Proposed Change
Columbia Blvd. (West of US 30)	Minor Arterial	Collector
Vernonia Road (South of Columbia Blvd.)	Minor Arterial	Collector
Gable Road (West of US 30)	Minor Arterial	Collector
Bachelor Flat Road (Saulser to Columbia Blvd.)	Minor Arterial	Collector
Summit View Drive (north of Bachelor Flat Road)	Minor Arterial	Collector
Ross Road (Millard to Bachelor Flat Road)	Minor Arterial	Collector
Achilles Road (Morse Road to US 30)	Minor Arterial	Collector
S 1st Street (Columbia Blvd. to St. Helens Street	Minor Arterial	Collector
Saulser Road (Bachelor Flat to Sykes Road)	Local Street	Collector
N 6th Street (North of West Street)	Local Street	Collector
S 4th Street (south of St. Helens Street)	Local Street	Collector
S 1st Street (South of St. Helens Street)	Local Street	Collector

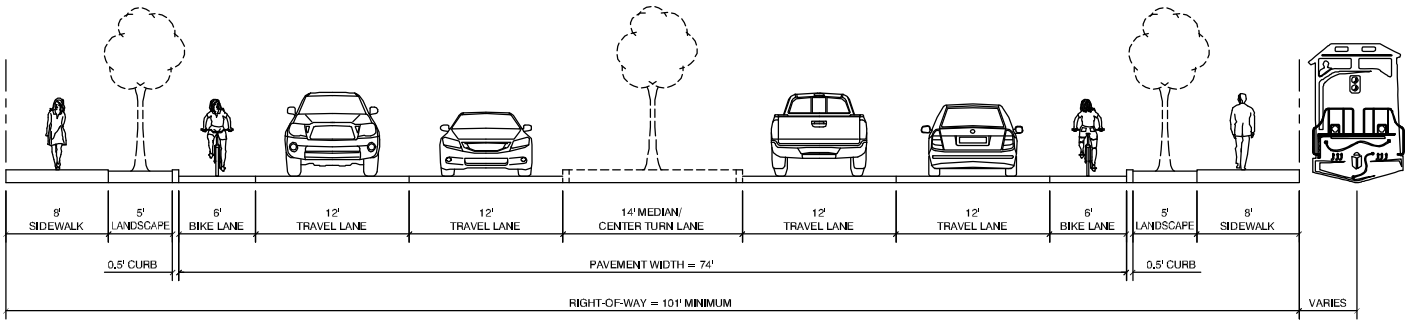
The proposed roadway changes are consistent with Columbia County's roadway network plans as presented in the Columbia County Transportation System Plan (Reference 11). For example, Columbia County currently classifies Bachelor Flat Road as a Minor Collector roadway.

In considering potential functional classification plan changes, it should be noted that Federal funding of roadway improvement projects through grants and other funding packages is generally targeted to roadways that have an arterial or higher classification. While collector facilities are less likely to receive external federal funding for improvements, there are state grants available for collector street improvements.

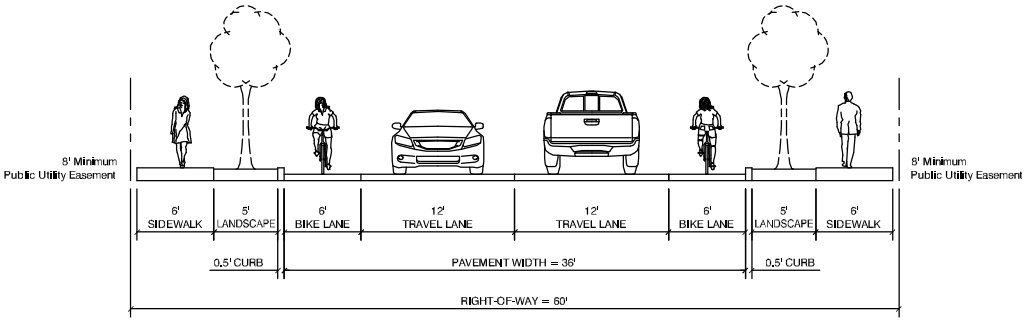
Potential Roadway Cross Section Standard Revisions

As documented in the Section 3, the roadway cross sections shown in the 1997 TSP are inconsistent with the street cross section information included in the City's Community Development Code. Therefore, new cross sections were developed for each of the functional classifications with assistance from City staff. Figures 6-6 and 6-7 illustrate the proposed street cross sections included in the Complete Streets Options.

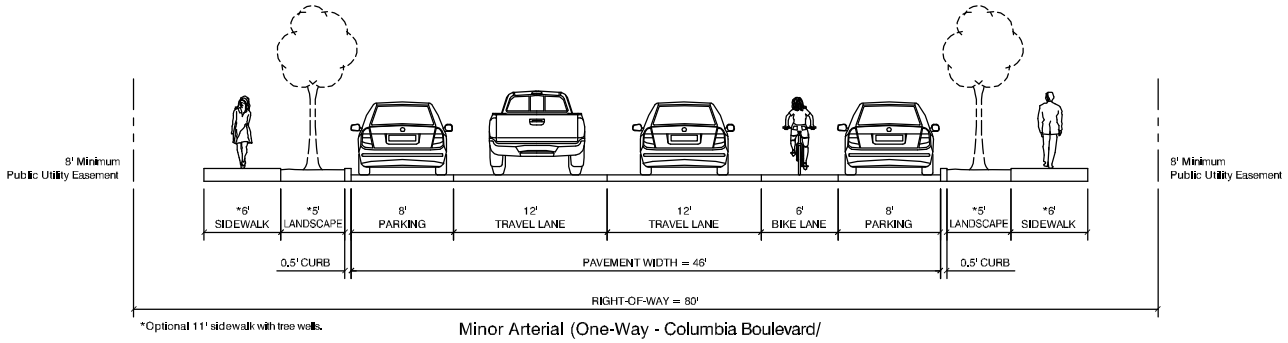
As shown in the figures, standard cross sections are provided for US 30 as well as St. Helens Street and Columbia Boulevard. Landscape strips and the potential for streets trees were incorporated into the standard cross sections based on community feedback and direction provided by the City. The addition



Major Arterial (US 30)*

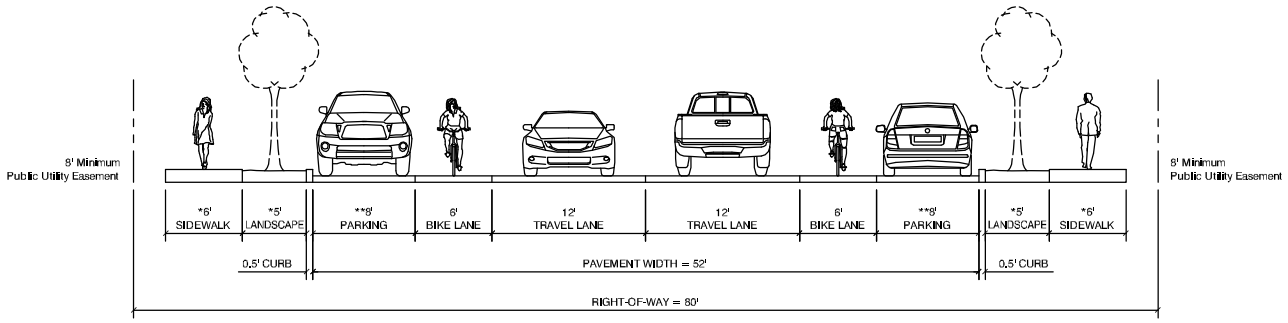


Minor Arterial (Typical)



*Optional 11' sidewalk with tree wells.

Minor Arterial (One-Way - Columbia Boulevard/ St Helens Street - US 30 to 13th Street)



*Optional 11' sidewalk with tree wells.
**On-street parking may be reduced to allow for installation of a left-turn lane where needed.

Minor Arterial (Two-Way Downtown)

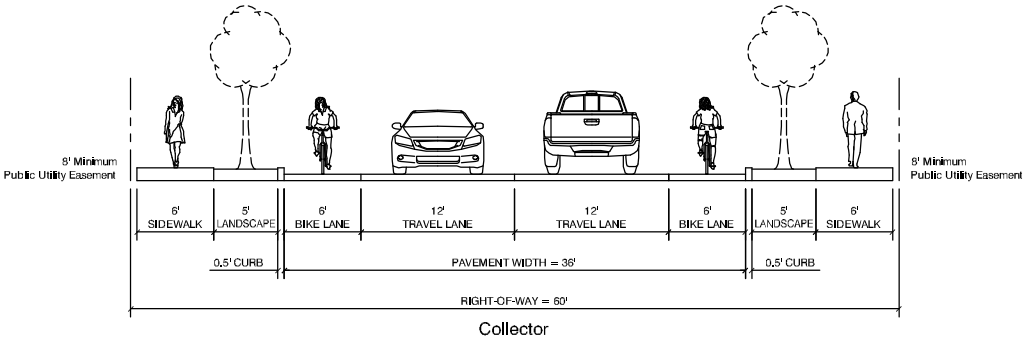
LEGEND

TREES TO BE PROVIDED AS APPROPRIATE PER CITY CODE AND LOCATION SPECIFIC CONSIDERATIONS

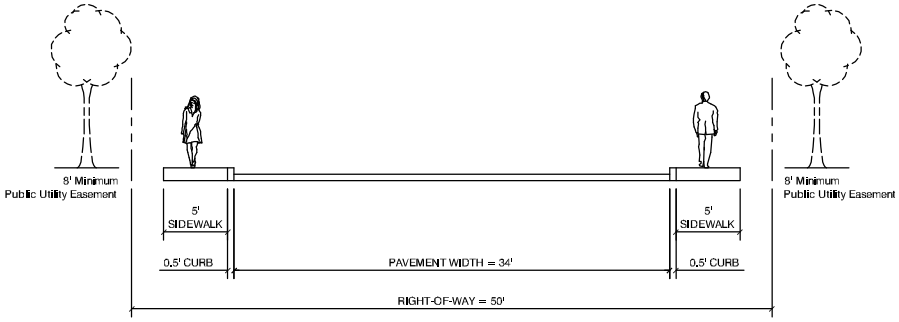
****The US 30 Cross-Sections are shown to be consistent with ODOT Standards. Specific roadway designs will be developed through a refinement plan or project development process. Design and future improvements to US 30 must also address ORS 366.215 (Reduction in Vehicle Carrying Capacity) on this national freight network facility.***

PROPOSED STREET CROSS SECTIONS ST. HELENS, OREGON

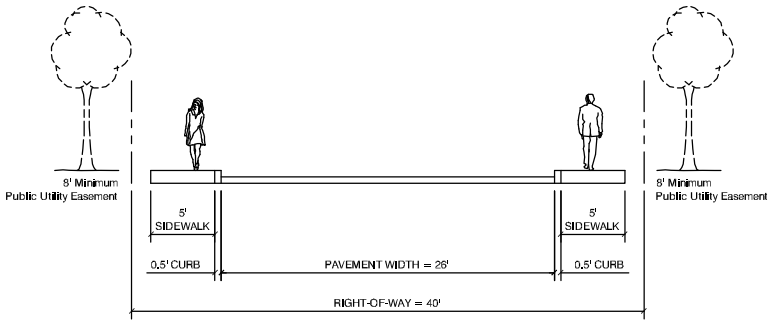
FIGURE 6-6



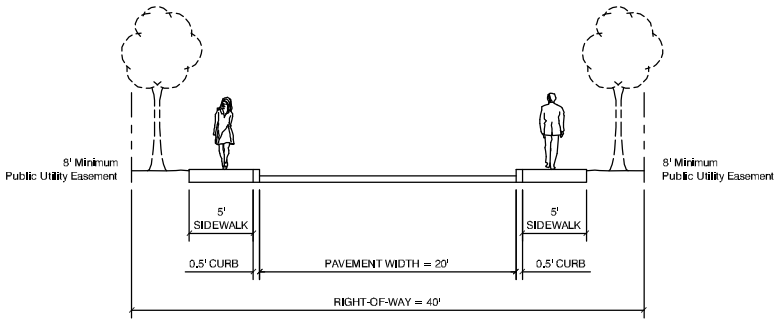
Collector



Local Street



Local "Skinny" Street



Local "Skinny" Street

LEGEND

TREES TO BE PROVIDED AS APPROPRIATE PER CITY CODE AND LOCATION SPECIFIC CONSIDERATIONS

PROPOSED STREET CROSS SECTIONS
ST. HELENS, OREGON

FIGURE
6-7

of street trees was approved and adopted by the City on December 1, 2010. Incorporating street trees and landscaping offers benefits including reduced travel speeds, an enhanced pedestrian experience, and beautification of the roadway.

Complete Streets Options Recommended for Inclusion in the Updated TSP

While the Complete Streets projects do not provide intersection vehicular capacity mitigation per se, they provide critical pedestrian and vehicular improvements and are recommended for inclusion in the TSP Update. Tables 6-2 through 6-5 summarize the pedestrian and bicycle improvement projects included in the complete streets option that are part of the TSP Update.

SIDEWALK IMPROVEMENT PROJECTS

The estimated project costs shown in Table 6-2 reflect the planning level costs associated with the installation of sidewalks and/or curbs on one or two sides of a given roadway in accordance with the proposed street cross sections. The costs also include estimates for mobilization, landscaping, traffic control, architectural/ engineering, and construction management. The costs do not include the purchase of additional right-of-way or widening the road (road widening is accounted for in the bicycle improvement projects).

TABLE 6-2: PEDESTRIAN IMPROVEMENT PROJECTS

Project No.	Project Location	Project Description	Estimated Cost
P01	Sunset Blvd. (Pittsburg Road to Columbia Blvd.)	Add curbs and sidewalks	$668,000
P02	Columbia Blvd. (Sykes Road to US 30)	Add curbs and sidewalks	$1,353,000
P03	Sykes Road (Summit View Drive to Columbia Blvd.)	Add curbs and sidewalks	$805,000
P04	Sykes Road (Columbia Blvd. to US 30)	Add curbs and sidewalks	$190,000
P05	Bachelor Flat Road (Ross Road to Columbia Blvd.)	Add curbs and sidewalks	$804,000
P06	Columbia Blvd. (Gable Road to Sykes Road)	Add curbs and sidewalks	$400,000
P07	Gable Road (Bachelor Flat to US 30)	Add curbs and sidewalks	$995,000
P08	Vernonia Road (Pittsburg Road to US 30)	Add curbs and sidewalks	$1,319,000
P09	McNulty Way (Millard Road to Gable Road)	Add curbs and sidewalks	$749,000
P10	16th Street (West Street to Middle School Driveway	Add curbs and sidewalks	$266,000
P11	Firlock Park Road (Gable Road to US 30)	Add curbs and sidewalks	$1,103,000
P12	18th Street (Columbia Blvd. to Old Portland Road)	Add curbs and sidewalks	$638,000
P13	12th Street (Columbia Blvd. to Old Portland Road)	Add curbs and sidewalks	$580,000
P14	Matzen Street (Columbia Blvd. to Sykes Road)	Add curbs and sidewalks	$94,000
P15	Old Portland Road (Gable Road to St. Helens Street)	Widen roadway and add bike lanes	$2,199,000
P16	Pittsburg Road (Barr Road to Vernonia Road)	Add curbs and sidewalks	$680,000
P17	Pittsburg Road (Vernonia Road to Sunset Blvd.)	Add curbs and sidewalks	$402,000
P18	Port Avenue (Milton Way to Old Portland Road)	Add curbs and sidewalks	$453,000
P19	Milton Way (Port Avenue to Columbia Blvd.)	Add curbs and sidewalks	$756,000
P20	Oregon Street (West Street to Rutherford Parkway)	Add curbs and sidewalks	$841,000
P21	Deer Island Road (US 30 to West Street)	Add curbs and sidewalks	$591,000

INTERSECTION IMPROVEMENT PROJECTS

Table 6-3 summarizes pedestrian facility improvement projects at key intersections throughout the City, along with the corresponding planning level cost estimate.

TABLE 6-3: PEDESTRIAN FACILITY IMPROVEMENT PROJECTS AT INTERSECTIONS

Project No.	Project Location	Project Description	Estimated Cost
P22	Columbia Blvd./Sykes Road	Install 2 striped crosswalks and 6 new ADA ramps	$19,000
P23	18th Street/Old Portland Road	Install 2 striped crosswalks and new 6 ADA ramps	$19,000
P24	Columbia Blvd./St. Helens Couplet	Install curb extensions (4 locations)	$106,000
P25	Columbia Blvd. Couplet to 2nd Street	Install curb extensions and island refuges (8 locations)	$200,000
P26	Columbia Blvd./1st Street	Install 1 striped crosswalk and 3 new ADA ramps	$10,000
P27	St. Helens Street	Install curb extensions (4 locations)	$106,000
P28	US 30 Corridor	Install Pedestrian Countdown Heads (5 Locations)	$15,000

BICYCLE IMPROVEMENT PROJECTS

The estimated project costs shown in Table 6-4 reflect the total planning level costs associated with widening on one or two sides of a given roadway to accommodate bicycle lanes if needed and installing bicycle pavement markings. The costs also include estimates for relocating storm drains, signing and striping, mobilization, traffic control, architectural/ engineering, and construction management. The costs do not include the purchase of additional right-of-way.

TABLE 6-4: BICYCLE LANE IMPROVEMENT PROJECTS

Project No.	Project Location	Project Description	Estimated Cost
B01	Cherrywood Drive (Vernonia Road to Columbia Blvd.)	Add sharrows	$4,500
B02	Barr Avenue (Pittsburg Road to Sykes Road)	Add sharrows	$5,500
B03	Sunset Blvd. (Pittsburg Road to Columbia Blvd.)	Add bike lanes	$15,000
B04	Columbia Boulevard (Sykes Road to US 30)	Add bike lanes	30,000
B05	Sykes Road (Summit View Drive to Columbia Blvd.)	Widen roadway and add bike lanes	$643,000
B06	Bachelor Flat Road (Ross Road to Columbia Blvd.)	Widen roadway and add bike lanes	$461,000
B07	Columbia Blvd. (Gable Road to Sykes Road)	Widen roadway and add bike lanes	$304,000
B08	Gable Road (Bachelor Flat to US 30)	Widen roadway and add bike lanes	$502,000
B09	Vernonia Road (Pittsburg Road to US 30)	Widen roadway and add bike lanes	$482,000
B10	McNulty Way (Millard Road to Gable Road)	Widen roadway and add bike lanes	$337,000
B11	Firlock Park Road (Gable Road to US 30)	Widen roadway and add bike lanes	$891,000
B12	18th Street (Columbia Blvd. to Old Portland Road)	Widen roadway and add bike lanes	$242,000
B13	12th Street (Columbia Blvd. to Old Portland Road)	Widen roadway and add bike lanes	$364,000
B14	Matzen Street (Columbia Blvd. to Sykes Road)	Widen roadway and add bike lanes	$51,000
B15	Old Portland Road (Gable Road to St. Helens Street)	Widen roadway and add bike lanes	$1,048,000
B16	Old Portland Road (Millard Road to Gable Road)	Add 10-foot Multi-Use Path on east side of roadway	$872,000
B17	Old Portland Road (City Limits to Millard Road)	Add 10-foot Multi-Use Path on east side of roadway	$517,000
B18	Pittsburg Road (Barr Road to Vernonia Road)	Widen roadway and add bike lanes	$562,000
B19	Pittsburg Road (Vernonia Road to Sunset Blvd.)	Widen roadway and add bike lanes	$242,000
B20	Port Avenue (Milton Way to Old Portland Road)	Widen roadway and add bike lanes	$340,000
B21	Milton Way (Port Avenue to Columbia Blvd.)	Widen roadway and add bike lanes	$709,000

BICYCLE CROSSING IMPROVEMENT PROJECTS

Table 6-5 summarizes bicycle crossing improvement projects at key intersections on US 30, along with the corresponding planning level cost estimate.

TABLE 6-5: BICYCLE CROSSING IMPROVEMENT PROJECTS

Project No.	Project Location	Project Description	Estimated Cost
B22	US 30/St. Helens Street	Reconfigure bike lane striping across right turn lane	$5,000
B23	US 30/Gable Road	Enhance existing bicycle facilities with pavement markings and signage	$5,000

1997 TSP OPTION

The 1997 TSP Option includes many of the capacity improvements recommended in the currently adopted TSP unless otherwise noted. This option incorporates the Transportation System Management (TSM) strategies identified in the 1997 TSP, including the addition of several new roadway facilities and the installation of several new traffic signals at key study intersections.

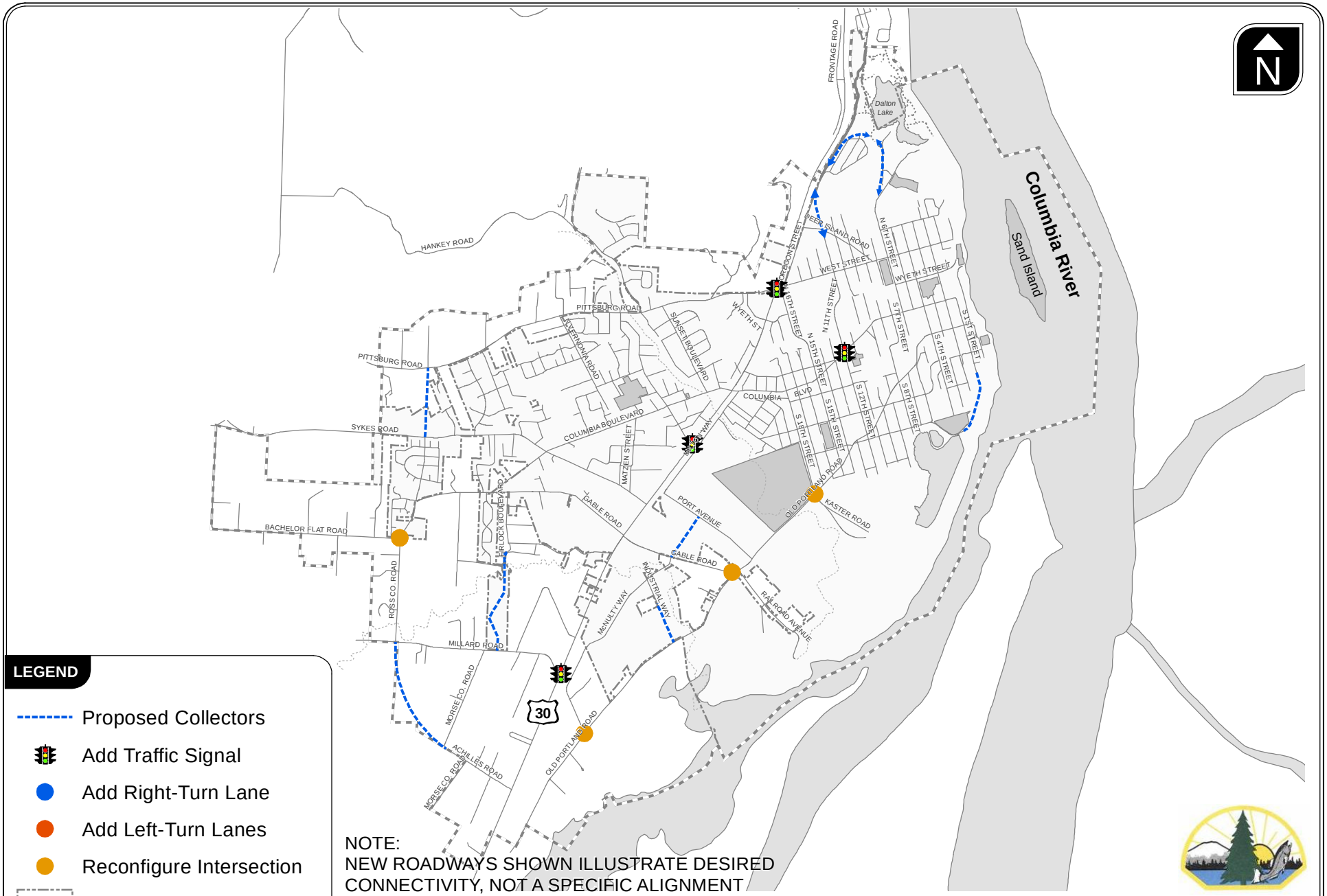
ROADWAY IMPROVEMENTS

Several of the new roadway facilities recommended in the 1997 TSP have been completed or are in various stages of completion, while several others are no longer considered viable. This option includes many of the same new roadway facilities recommended in the 1997 TSP that have not yet been completed as well as new roadway facilities identified throughout the TSP update process. Figure 6-8 illustrates the location of the new roadway facilities and the potential alignment of two future facilities included in the 1997 TSP Option. All of the new roadway facilities shown in Figure 6-8 would include the addition of sidewalks, bicycle lanes, travel lanes, and on-street parking based on the functional classification of the individual roadway. Each facility is intended to improve circulation throughout the city while reducing reliance on US 30.

Roadway Improvement Projects Proposed For Removal from 1997 TSP

Based a review of existing development patterns and feedback from City staff, the following roadway projects recommended in the 1997 TSP now appear impractical:

- St. Helens Street Extension (US 30 to Columbia Boulevard): this project no longer appears viable given its significant impact on existing developments west of US 30, the challenges associated with connecting St. Helens Street and Columbia Boulevard at a new intersection west of US 30, and the minimal operational improvement gained.
- US 30 Frontage Roads: a system of frontage roads west of, and parallel to, US 30 was identified in the 1997 TSP but has proven nearly impossible to implement since the TSP was adopted. The project is now considered infeasible given significant impacts on existing developments west of US 30 and the amount of right-of-way required for each segment of new roadway.
- Milton Way Extension (Port Avenue to Gable Road): the alignment shown in the 1997 TSP would require an at-grade railroad crossing at a skewed angle that may not be feasible. The new alignment shown in Figure 6-8 is intended to provide the same level of connectivity without the skew, improving the potential for obtaining a new at-grade railroad crossing.



PROPOSED IMPROVEMENT PROJECTS - 1997 TSP OPTION
ST. HELENS, OREGON

FIGURE **6-8**

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INTERSECTION IMPROVEMENTS

This option includes several of the intersection capacity improvement projects identified in the 1997 TSP as well as several new improvement projects identified through the TSP update process, including:

- the addition of a right-turn lane at US 30/Gable Road intersection,
- the reconstruction of the Old Portland Road/Gable Road intersection to emphasize through movements on Old Portland Road,
- the reconstruction of the Columbia Boulevard/Sykes Road intersection to provide left-turn lanes on Columbia Boulevard,
- the reconstruction of the Ross Road/Bachelor Flat Road intersection to provide left-turn lanes, and,
- the provision of traffic signals at four locations, including:
    - US 30/Millard Road
    - US 30/Vernonia Road
    - US 30/Pittsburg Road
    - Columbia Boulevard/12th Street

The need to coordinate the new traffic signals along US 30 with the existing traffic signals and to retime and optimize the entire signal system was also identified as a priority under this option. It should be noted that the US 30/Vernonia Road and US 30/Pittsburg Road intersections may require approval of a deviation to the access spacing standards to accommodate signalization. Figure 6-8 illustrates the location and type of intersection improvement projects included in the 1997 TSP Option.

In addition to the capacity improvements identified above, regrading of the southwest corner of the US 30/Millard Road intersection is recommended to provide clear sight distance for eastbound drivers looking in the southern direction. Further, available sight lines for eastbound drivers facing south at the intersection can be enhanced by removing temporary and permanent signs located on the intersection corner that limit drivers view. If the intersection is signalized, the sight distance improvements will be less important.

Intersection Improvement Projects Proposed For Removal from 1997 TSP

Based on the intersection operations assessment and community feedback, some of the intersection improvements included in the 1997 TSP are either no longer considered viable and/or other

alternative mitigation measures have been identified. Improvement projects contained in the current TSP that are no longer recommended for implementation are discussed below.

The 1997 TSP recommended the installation of traffic signals at two additional intersections when warranted. However, based on the 2031 traffic volume projections, signalization of these intersections is not anticipated to be warranted within the 20-year planning horizon and the intersections are forecast to continue to operate acceptably from a capacity perspective. The two locations are:

- Columbia Boulevard/Vernonia Road
- Columbia Boulevard/6th Street

Other types of traffic control, such as all-way stop control, could be considered at the Columbia Boulevard/6th Street intersection for safety or capacity reasons as traffic volumes increase. Roundabouts could also be considered at several locations throughout the city as a way of mitigating safety concerns at unsignalized intersections or operational issues at intersections that do not meet mobility standards, but do not meet signal warrants. The following intersections have been identified as potential roundabout locations:

- Columbia Boulevard/12th Street: Although the 1997 TSP recommended a traffic signal at this location, a traffic signal is not expected to be warranted based on evaluation of preliminary signal warrants. A roundabout in this location, however, could improve traffic operations and serve as a gateway treatment into the commercial areas along Columbia Boulevard and St. Helens Street as well as into the downtown. In addition to serving a traffic control function, roundabouts present opportunities to create community focal points, landscaping, and other gateway features within an intersection form that is safe and efficient.
- Columbia Boulevard/Sykes Road: Both this intersection and the Columbia Boulevard/12th Street intersection are near schools. A primary benefit of a roundabout is enhanced safety and the reduction of vehicle speeds in and around the roundabout. Roundabouts improve pedestrian crossing opportunities, providing mid-block refuge and the ability for pedestrians to focus on one traffic stream at a time while crossing with or without crossing guards.
- 1st Street/Cowlitz Street: A roundabout at this intersection, or perhaps further to the south, could serve as another gateway treatment into the downtown area when the Plymouth Street extension is complete. A roundabout could also enhance the U-turn movement that has occurred at this location for some time.

Additional information related to roundabouts, including general characteristics, user and location considerations, and potential benefits are well documented and can be found in the FHWA's *Technical Summary on Roundabouts* (Reference 12) and NCHRP Report 672, *Roundabouts: An Informational Guide, Second Edition* (Reference 13).

The 1997 TSP also recommended installation of a second westbound left-turn lane at the US 30/Gable Road intersection. For reasons explained further later in this section, installation of a second westbound left-turn lane on Gable Road is no longer recommended.

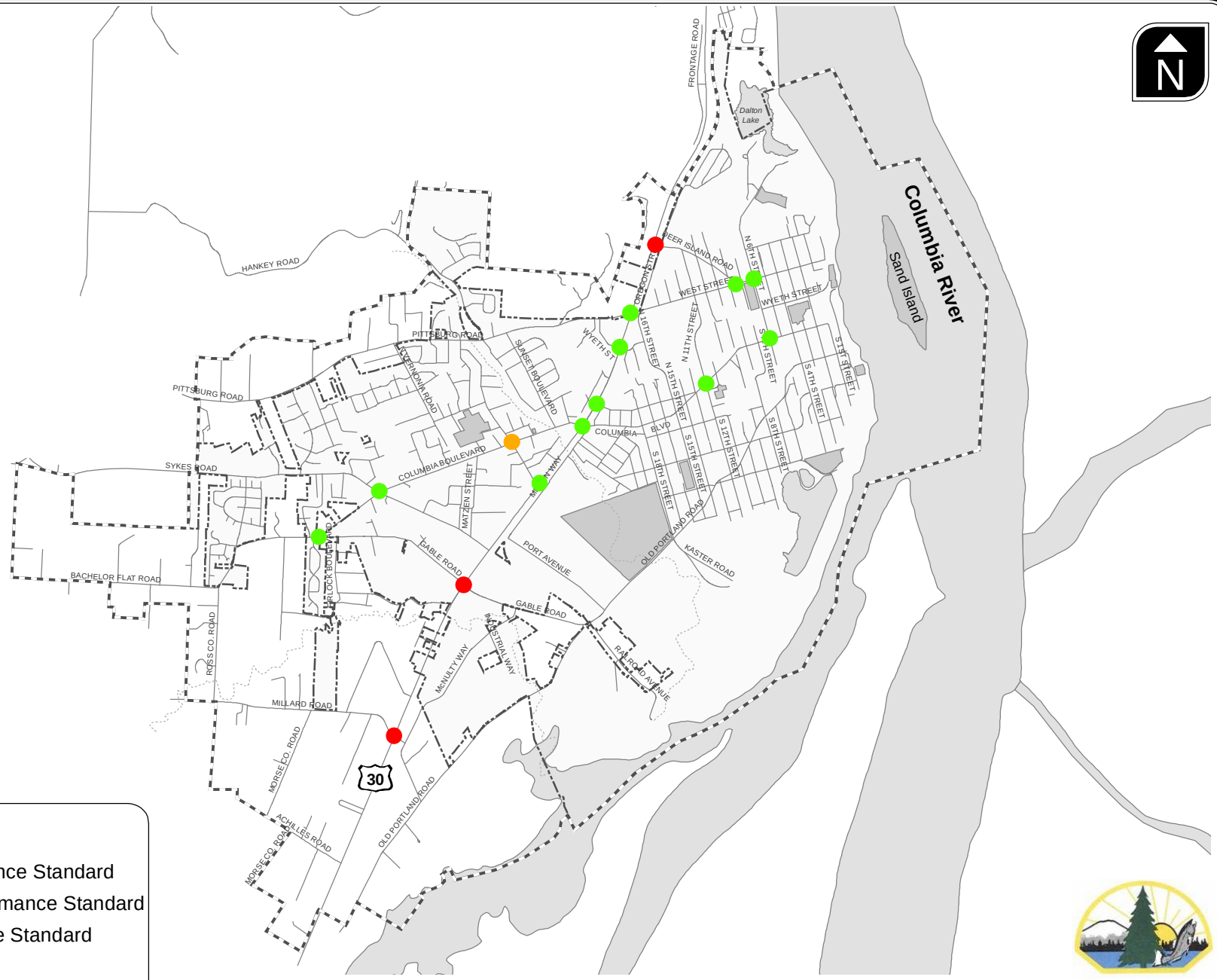
Study Intersection Operations Impact

Figure 6-9 summarizes those intersections that operate acceptably, unacceptably, and near capacity assuming the improvements identified in the 1997 TSP Option. As shown in the figure, the US 30/Millard Road, US 30/Gable Road, and US 30/Deer Island Road intersections would operate unacceptably under the TSP Option. Additional and/or alternative mitigation measures at these intersections are provided below. Also shown in Figure 6-9, operations at the Bachelor Flat/Gable Road intersection improve as compared to the no-build as east-westbound vehicles re-route toward the south with the provision of a traffic signal at the US 30/Millard Road intersection.

1997 TSP Options Recommended for Inclusion in the Updated TSP

While the TSP Option projects do not mitigate all of the forecast transportation system needs, many of the individual improvement projects are applicable for inclusion in the TSP Update. Tables 6-6 and 6-7 summarize the roadway and intersection improvement projects included in the 1997 TSP Option that are recommended to become part of the final TSP update based on feedback from the community and City, County, and ODOT staff[9].

[9] Before a signal can be installed on the State system, OAR 734-020-0440 requires a traffic engineering investigation that shows how traffic signal warrants and highway design and spacing standards are met with the proposed signal and how the proposed signal would improve the overall safety and operation of the intersection. A progression analysis would be required as per OAR 734-020-0470 for signals that will not meet the one half mile minimum spacing standard for traffic signals on State highways. Signals may not be installed until signal warrants are satisfied and the installation request and design has been approved by the State Traffic Engineer (OAR 734-020-0410).



FUTURE TRAFFIC CONDITIONS - 1997 TSP OPTION
ST. HELENS, OREGON

FIGURE **6-9**

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TABLE 6-6: STREET IMPROVEMENT PROJECTS (NEW ROADWAYS)

Project No.	Project Roadway	From/To	Order-of-Magnitude Project Cost
S01	Summit View Drive Extension	Install roadway, curbs, and sidewalks	$1,656,000
S02	Achilles Road Extension	Install roadway, curbs, and sidewalks	$2,952,000
S03	Industrial Way Extension	Install roadway, curbs, and sidewalks	$1,000,000
S04	Plymouth to 1st Street Extension	Install roadway, curbs, and sidewalks	$1,505,000
S05	Firlock Park Extension	Install roadway, curbs, and sidewalks	$2,260,000
S06[1]	Milton Way Extension	Install roadway, curbs, and sidewalks	$1,767,000
S07	Millard Road	Reconstruct roadway to City street standards	$2,892,000
S08	Ross Road	Reconstruct roadway to City street standards	$1,617,000

[1]Project will require coordination/approval by ODOT Rail Division. In addition to the estimated roadway construction costs, the order-of-magnitude cost includes the provision of left-turn lanes along Gable Road, detection along the spur track, and crossing gates with warning lights and bells at the rail crossing.

TABLE 6-7: INTERSECTION IMPROVEMENT PROJECTS

Project No.	Project Roadway	Project Description	Order-of-Magnitude Project Cost
S09	Ross Road/Bachelor Flat Road	Conduct a study and implement AWSC if warranted	$12,000
S10	US 30/Millard Road	Regrade southwest corner to provide adequate sight distance	$20,000
S11	18th Street/Old Portland Road	Reconfigure intersection to stop control or upgrade signal to current standard	$100,000
S12[1]	US 30/Deer Island Road	Install westbound right-turn lane	$485,000
S13[1,2]	US 30/Millard Road Intersection	Install traffic signal and reconfigure the McNulty Way/Millard Road intersection to accommodate heavy truck turning movements	$1,000,000
S14	Columbia Boulevard/Sykes Road	Install left-turn lanes on Columbia Boulevard	$368,000
S15	Ross Road/Bachelor Flat Road	Reconfigure intersection to emphasize the northbound-through movement	$769,000
S16	Old Portland Road/Millard Road	Widen intersection to accommodate heavy truck turning movements	$60,000
S17[1]	US 30/Gable Road	Install westbound right-turn lane	$485,000
S18[2]	US 30/Pittsburg Road	Install traffic signal	$400,000
S19[2]	US 30/Vernonia Road	Install traffic signal	$400,000
S20[2]	12th Street/Columbia Blvd.	Install traffic signal or roundabout	$250,000
S21	Old Portland Road/Gable Road	Realign intersection to emphasize northbound movement	$2,785,000

[1]Project will require coordination/approval by ODOT and ODOT Rail Division. Engineering studies, traffic analysis, and conformance with ODOT standards will be evaluated as projects are developed.
[2]Project must meet traffic signal warrants and receive approval from State Traffic Engineer. Engineering studies, signal warrant and traffic analysis, and conformance with ODOT standards will be evaluated as projects are developed.

RAIL CORRIDOR OPTION

The primary focus of the Rail Corridor Option is the development of an ultimate highway/rail grade crossing plan along the Portland and Western Railroad (PNWR)/US 30 corridor. This option includes improvements to key study intersections, rail crossings, and other related facilities identified in the Lower Columbia River Rail Corridor Plan (LCRRC).

RAIL CORRIDOR IMPROVEMENTS

Grade Crossings

Grade crossings are classified by the type of protection provided and are considered either active or passive. Active crossing systems generally have an electronic train detection system with flashing lights that warn the motorist when a train is approaching or at the crossing. Although an active crossing system is relatively expensive to install and maintain, it provides a safer grade crossing as compared to a passive system. A passive system simply denotes the location of the crossing (typically through signing or pavement markings) and depends on the motorist to detect and yield the right-of-way to the train. Depending on the available sight distance and train speeds, passive crossings require a comparatively high level of awareness on the part of the motorist. All of the PNWR railroad crossings adjacent to US 30 in St. Helens have active crossing systems.

Preemption and Interconnect Requirements

For safety reasons, traffic signals on US 30 in St. Helens adjacent to the PNWR grade crossings are able to communicate with each other using "interconnect" between the traffic signal equipment and the railroad equipment. The interconnect link allows the railroad equipment to communicate the approach and presence of a train to the traffic signal equipment.

Interconnect is currently provided at the grade crossings of Gable Road, Columbia Boulevard, St. Helens Road, and Deer Island Road. When a train approaches each of these crossings, the adjacent traffic signal's normal operations are pre-empted and the traffic signal shifts focus to moving vehicles off of the roadway approach with the grade crossing. Signs are also illuminated on the highway to prevent highway traffic from turning onto the grade crossing.

Potential Railroad Grade Crossing Closures

Within St. Helens, the LCRRC study recommends studying the potential closure of the Wyeth Street railroad grade crossing, which would require westbound vehicles currently using the intersection to reroute either toward the south via St. Helens Street or toward the north via Deer Island Road.

Pedestrians and bicyclists would also have to reroute and access US 30 from either the grade crossing at Deer Island Road or St. Helens Street. The LCRRC study provides context for closing grade crossings as follows:

- Eliminating redundant or unnecessary roadway/railroad at-grade crossings is an important part of improving safety of rail corridors. Yet, closing a road is a serious, and possibly contentious, undertaking. Property owners must be provided access to the transportation network, and even with alternative access, there is often resistance to changing long-standing travel patterns. Thus, the goals of safety, public necessity, convenience, economics and the right to access property along a railroad alignment must be balanced, when considering closing roads.

The ODOT (Rail Division) has the authority, within Oregon, to eliminate highway/rail at grade crossings (ORS Section 824.206 (1998)). Closure requests can be initiated by ODOT, the railroad or the local jurisdiction. In an effort to make closures more attractive to local communities, ODOT Rail offers assistance in improving intersections at locations near those which can be closed. Because at-grade crossing safety upgrades are expensive ODOT Rail's approach to closures enables more frequently used crossings to receive the needed safety upgrades.

ROADWAY-FOCUSED SOLUTIONS

US 30 Turn Lane Capacity Near Railroad Crossings

Traffic, especially during the evening peak period, can begin to queue to make right turns onto streets with at-grade highway/rail crossings along US 30. Without adequate storage, these queues can block through traffic on US 30, and create the potential for rear-end collisions or other crashes. The LCRRC study recommends extending the right-turn lane storage at the US 30/Columbia Boulevard intersection by 65-feet and will also require a standard ODOT taper length.

Similarly, southbound motorists wishing to make left hand turns onto cross streets with highway/rail grade crossings can be blocked by trains. Queues at signalized US 30 intersections can back up significantly during peak periods (notably morning peaks). This situation adds to congestion, and poses a safety concern as motorists encounter a long queue and/or try to go around it. Additional storage and/or signalization is recommended at several locations on the corridor as part of the Rail Corridor Option.

Figure 6-10 illustrates the changes to affected study intersection lane configurations and traffic control devices under the Rail Corridor Option as per the LCRRC Plan. Other non-intersection improvements are summarized below.

Relocated St. Helens Switching Operations

St. Helens Yard is a rail yard that supports local rail-served customers. It also creates a mobility barrier within the community for motor vehicle and pedestrian traffic. As indicated in the existing conditions analysis, both the community and the railroad are concerned about trespassing, as it represents a potential safety risk and liability issue. The LCRRC Plan noted the potential option of relocating the rail yard outside City limits. The Plan further notes that PNWR will continue to serve customers in the St. Helens area and that it may be impossible for the railroad to completely vacate the yard. With an estimated $3.67 million relocation cost (without land acquisition costs) and no currently identified suitable replacement site, the timeline for any potential relocation is unknown.

Fencing or Landscape Barriers

The LCRRC Plan recommended installation of fencing along St. Helens yard as a partial solution to trespassers. The plan estimated an order-of-magnitude chain-link fencing cost of $84,000 not including maintenance and further noted that more visually appropriate fencing solutions (such as incorporating sight-obscuring slats or landscape elements) would involve additional costs.

Study Intersection Operations Impact

Figure 6-11 summarizes those intersections that operate acceptably, unacceptably, and near capacity assuming the improvements identified in the Rail Corridor Option. As shown in the figure, a majority of the intersections continue to operate in failure under the Rail Corridor Option. As in the previous option, operations at the Bachelor Flat/Gable Road intersection improve as east-westbound vehicles re-route toward the south with the provision of a traffic signal at the US 30/Millard Road intersection.

PROPOSED IMPROVEMENT PROJECTS - RAIL CORRIDOR OPTION
ST. HELENS, OREGON

FIGURE
6-10

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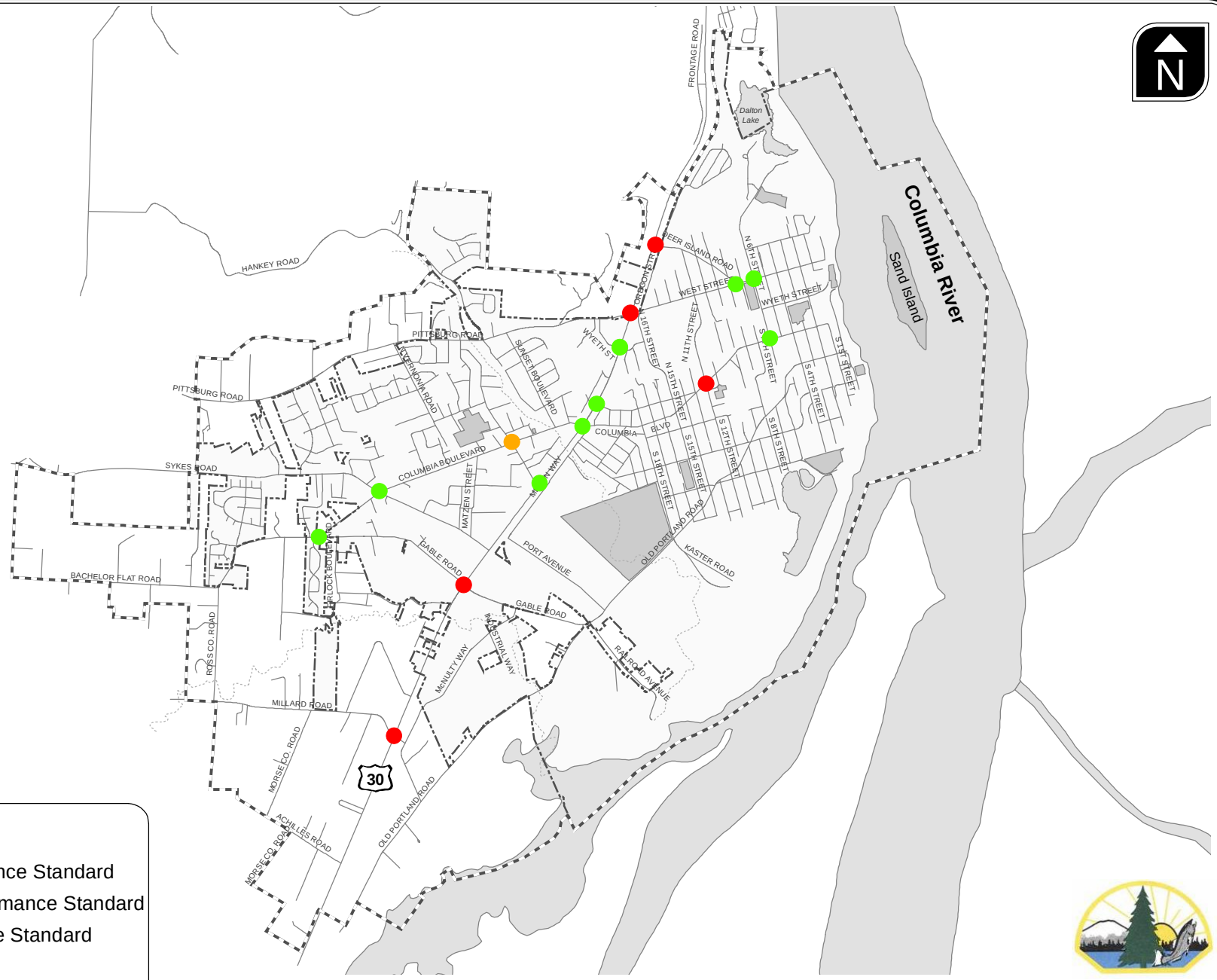

LEGEND

- Exceeds Performance Standard
- Approaches Performance Standard
- Meets Performance Standard
- City Limits
- City UGB

FUTURE TRAFFIC CONDITIONS - RAIL CORRIDOR OPTION
ST. HELENS, OREGON

FIGURE **6-11**

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Rail Corridor Options Recommended for Inclusion in the Updated TSP

The LCRRC study was conducted as a joint effort involving Columbia County, ODOT, ODOT Rail, and cities along the corridor including St. Helens. The recommendations in the Rail Corridor Option are generally all applicable to the TSP Update, though there is no expectation that they will all be funded by the City. For example, the LCRRC plan identifies the potential future signalization of the US 30/Millard Road intersection and notes several improvements along Deer Island Road that will be provided in conjunction with the new transit center now under construction.

Table 6-8 summarizes the intersection and roadway improvement projects included in the Rail Corridor Option that are recommended for inclusion in the TSP Update. The order-of-magnitude costs shown were obtained from the LCRRC report.

TABLE 6-8: INTERSECTION IMPROVEMENT PROJECTS

Project No.	Intersection	Project Description	Order-of-Magnitude Project Cost
R01	US 30/Wyeth Road	Study potential closure	TBD
R02[1]	US 30/Columbia Blvd.	Close pedestrian access or adjust signal timing to provide sufficient crossing time for pedestrians	$0
R03	US 30/Columbia Blvd.	Add 215 feet southbound left turn queue storage	$56,800
R04	US 30/Columbia Blvd.	Add 65 feet to existing northbound right-turn storage	$17,200
R05[1]	US 30/Millard Road	Install traffic signal inter-tied with existing railroad crossing protection (8-phase signal)	$250,000 (per LCRRC study)
R06	US 30/Millard Road	Install at-grade pedestrian sidewalk across the crossing	$45,000
R07	US 30/Deer Island Road	Remove abandoned rail line and restripe the intersection of Deer Island Road/Oregon Road	$25,000
R08	US 30/Deer Island Road	Relocate gate, design for future transit center	$25,000
R09	US 30/Deer Island Road	Install at-grade pedestrian sidewalk across the crossing	$45,000
R10	US 30/Deer Island Road	Add 150 feet southbound left turn queue storage	$62,265
R11	US 30/St. Helens Street	Install at-grade pedestrian sidewalk across the crossing	$45,000
R12	US 30/St. Helens Street	Replace obsolete gate	$90,000
R13	US 30/Gable Road	Add 210 southbound left-turn queue storage	$55,400
R14	US 30/Gable Road	Install ADA compliant pedestrian/bicycle overpass over railroad and US 30	$6,100,000

[1] Project will require coordination/approval by ODOT and ODOT Rail Division and requires State Traffic Engineer approval. Engineering studies, traffic analysis, and conformance with ODOT standards will be evaluated as projects are developed.

Potential Additional Mitigation Measures

As previously indicated, none of the three options packages fully mitigated all of the study intersections. Potential additional mitigation measures were reviewed at the intersections that are forecast to operate unacceptably, as summarized below.

US 30/DEER ISLAND

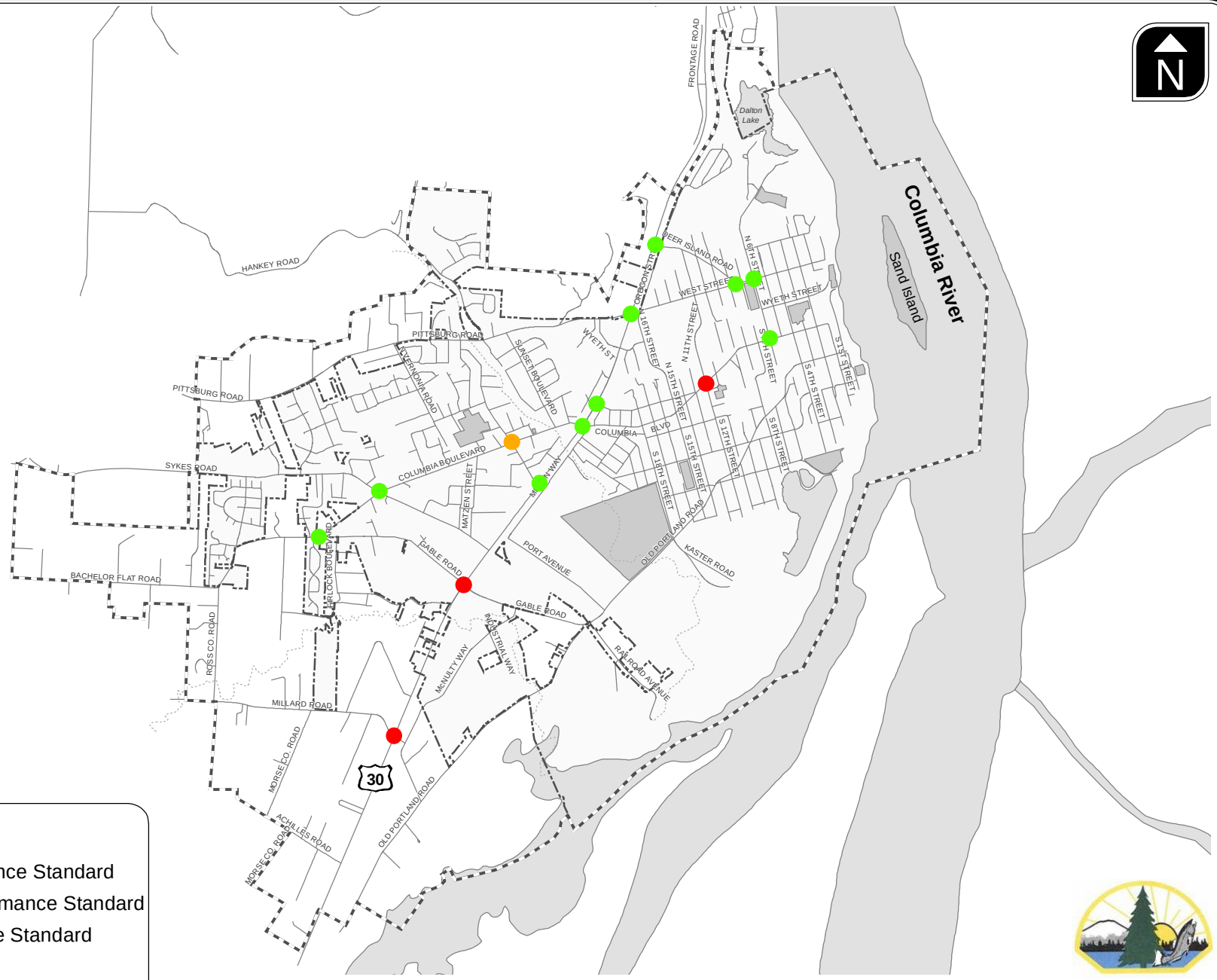
The US 30/Deer Island Road intersection is forecast to operate over capacity under all three options and the No Build. In addition, queuing at the US 30/Deer Island Road intersection is shown to exceed 550-feet in the westbound direction and would block access to/from Oregon Street and the site of the future St. Helens Transit Center.

Installation of a separate westbound left-turn lane would improve the intersection operations to a v/c ratio of 0.75 and would reduce westbound queuing. The addition of the left-turn lane would require widening and reconstruction of the adjacent PNWR grade crossing as well as part of the traffic signal and may involve right-of-way acquisition. The cost associated with this mitigation would be substantial yet queuing at the intersection will likely continue to extend past Oregon Street, effectively rendering Oregon Street to a right-in/right-out only. As such, additional outlets or a re-alignment of Oregon Street further east should be considered in the future.

US 30/PITTSBURG ROAD-WEST STREET OVERPASS

The LCRRC study highlighted the potential need for an overpass in St. Helens near the US 30/Pittsburg Road intersection, although the project was not included in the final study recommendations. Based on the study, the future overpass would extend over both US 30 and the railroad and cost between $5.6 and $9 million dollars and would likely have to be funded as a State Transportation Improvement Program (STIP) project.

Figure 6-12 illustrates the results of an operations analysis at the study intersections with the overpass assumed to be in place and the Wyeth Street access to US 30 assumed to be closed. As shown in the figure, operations at the US 30/Deer Island intersection improve with the overpass assuming a majority of the westbound left-turn movements would reroute toward the overpass. Constructed in isolation without other US 30 intersection improvements, a northern overpass would not mitigate the US 30/Gable Road and US 30/Millard Road intersection.



LEGEND

- Exceeds Performance Standard
- Approaches Performance Standard
- Meets Performance Standard
- City Limits
- City UGB

FUTURE TRAFFIC CONDITIONS - RAIL CORRIDOR OPTION - NORTHERN OVERPASS
ST. HELENS, OREGON

FIGURE **6-12**

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The grade separation project would improve emergency services dispatch options during the passage of trains through the City and/or in the event that a train blocked crossings for an extended period due to a derailment. School buses crossing US 30 and the railroad tracks could also be directed to the new overpass to reduce their delay in crossing the PNWR rail line.

US 30/GABLE ROAD

The US 30/Gable Road intersection also operates over-capacity under all of the options considered. Viewed as a stand-alone intersection, installation of dual left-turn lanes and separate right-turn lanes on all four intersection approaches would be necessary. This mitigation would require widening the Gable Road approaches to seven lanes (for example, on the south approach there would be two southbound through lanes, two northbound left-turn lanes, two northbound through lanes, and one northbound right-turn lane). Widening to accommodate the additional lanes would increase pedestrian exposure, increase the rail crossing width (likely requiring median channelization for a center railroad crossing gate), and necessitate significant right-of-way acquisition. Further, the US 30/Gable Road intersection would likely become the most heavily traveled intersection on the corridor, complicating the ability to implement coordinated signal timing along the highway corridor through St. Helens.

Even with these improvements, unless additional left turns can be diverted to other intersections such as Millard Road and Bennett Road to the south, the resulting v/c ratio (0.87) does not meet the applicable mobility standard. As such, additional alternative mitigation options were examined as described below.

US 30/MILLARD ROAD

Installation of a traffic signal at the US 30/Millard Road intersection was assumed under both the 1997 TSP Option and the Rail Corridor Option. With the anticipated rerouting of truck traffic to the newly signalized intersection, the nearby intersection of Millard Road/Old Portland Road will require reconstruction to facilitate truck turns. Currently, the skew of the Millard Road approach to Old Portland Road complicates truck turn movements at the intersection.

Signalization of the US 30/Millard Road intersection would significantly benefit the intersection in the near-term; however, a signal at this location is forecast to operate with a v/c ratio of 0.94 in the year 2031. The following additional improvements could be considered to mitigate the intersection to meet ODOT standards:

- Install separate right-turn lanes on the east and westbound approaches to the intersection. Note the additional right-turn lane at the westbound approach would require widening and reconstruction of the adjacent PNWR grade crossing. The cost associated with this mitigation would be substantial yet, similar to Gable Road, the resulting v/c ratio (0.87) still does not meet the applicable mobility standard.
- Install dual left-turn lanes, a separate through lane, and a separate right-turn lane on the east-west intersection approaches. Widening to accommodate the additional lanes will increase the rail crossing width (likely requiring median channelization for a center railroad crossing gate), and necessitate right-of-way acquisition.

Given that Gable Road and Millard Road still do not fully meet ODOT operating standards even with significant widening, additional alternative mitigation options were examined as described below.

SOUTHERN OVERPASS

The construction of an overpass at the southern portion of St. Helens would enhance operations at the US 30/Millard Road intersection and the US 30/Gable Road intersection by 1) shifting westbound left-turns (trips headed south out of St. Helens) and truck traffic further south, 2) creating alternative east-west connectivity across US 30 and the railroad tracks, and 3) providing a higher-capacity intersection treatment at US 30/Millard Road. Ideally, the overpass would be situated to create a loop connection linking Old Portland Road on the east side of the City with Millard Road and the future north-south collector network on the west side of the City. Compared to an overpass at Pittsburg Road, this improvement would likely have a more dramatic impact on operations all along US 30, including:

- Improved vehicular access and circulation to the residential areas east and west of US 30.
- Improved truck circulation to the industrial area east of US 30 assuming trucks would access US 30 at the overpass (reducing the potential for rail/truck interaction).
- Improved access and circulation for emergency response vehicles to areas both east and west of US 30.

In addition, as a majority of the traffic in St. Helens occurs near the southern end of the city, a southern overpass would improve operations through the City on the US 30 corridor (including the US 30/Gable Road intersection) by shifting a greater portion of local traffic circulation from US 30 onto the City roadway network before it reaches the more congested areas.

A preliminary concept was developed for the US 30/Millard Road intersection that includes provision of an overpass that spans both the highway and the rail line, but continues to rely on the existing

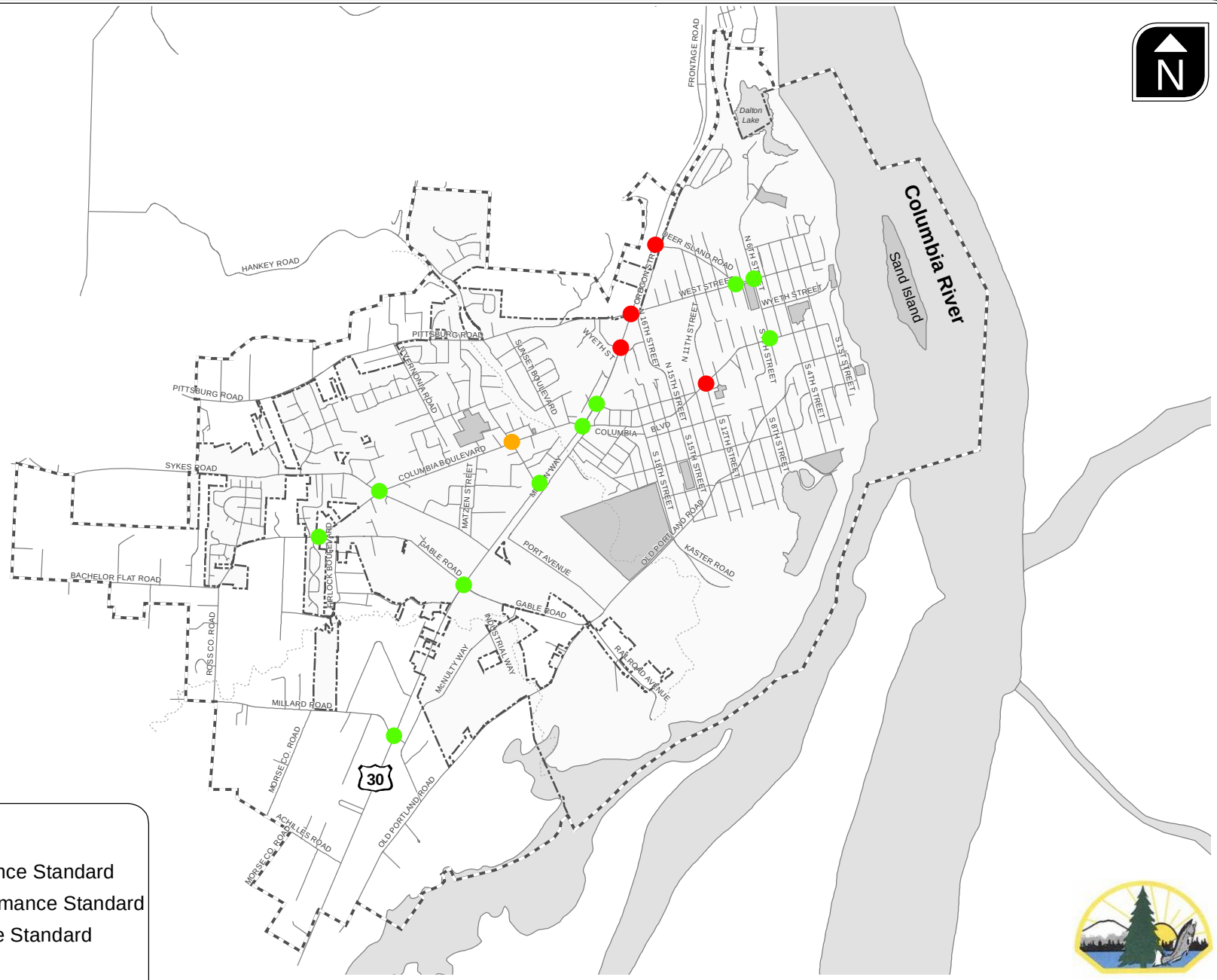
intersection for right-in/right-out turning movements. Based on information provided by ODOT, complete intersection grade separation is not practical at this location given the close proximity of the rail line to the highway and the need to get vehicles, including large trucks, up and an over the rail line. Figure 6-13 illustrates a conceptual sketch of the overpass.

Figure 6-14 summarizes the results of intersection operations analysis with the overpass concept in place. As shown in the figure, operations at the US 30/Millard Road intersection improve with the overpass because all of the left-turn movements are converted to right turn movements and all of the east-west through movements are completed on the overpass. Also shown in the figure, operations at the US 30/Gable Road intersection improve. The improvement at Gable Road reflects trips shifting to the higher-capacity overpass. Similar assumptions were made all along the US 30 corridor as a majority of the previously forecast northbound left-turn movements, including those at US 30/Pittsburg Road, were assumed to occur at the overpass. This redistribution of trips is predicated on the assumption that the adjacent roadway network is improved prior to, or along with the development of the overpass. The reduction in the northbound left-turns does not fully mitigate all of the capacity needs along US 30. As with the northern overpass option, some of the remaining unsignalized study intersections on US 30 would continue to fail.

Locating a southern overpass further to the south near Achilles Road was also considered; however, the PNWR rail corridor elevation is above the highway elevation south of Millard Road. As a result of the elevation difference and the rail line's proximity to US 30, ODOT's preliminary engineering team indicated that building a structure over both US 30 and the PNWR line would be difficult and potentially cost prohibitive.

SOUTHERN OVERPASS CONCEPTUAL DESIGN
ST. HELENS, OREGON

FIGURE
6-13



LEGEND

- Exceeds Performance Standard
- Approaches Performance Standard
- Meets Performance Standard
- City Limits
- City UGB

FUTURE TRAFFIC CONDITIONS - SOUTHERN OVERPASS
ST. HELENS, OREGON

FIGURE **6-14**

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US 30/BENNETT ROAD SIGNAL

While outside of the City of St. Helens UGB and the TSP study area, the US 30/Bennett Road intersection has the potential to significantly impact the City's transportation system. For example, signalizing the US 30/Bennett Road intersection could improve operations at the US 30/Millard Road and US 30/Gable Road intersections by diverting a large number of vehicles (particularly northbound right and westbound left-turns) off of US 30 at the new signal. This route offers vehicles (and particularly trucks) traveling south of St. Helens a relatively straight path to US 30 that would avoid impacting the US 30/Millard Road and US 30/Gable Road intersections. Both Gable Road and Millard Road are expected to carry substantial east-west through traffic in the future as they link employment areas on the east side of US 30 with the residential areas on the west as well as the commercial area along Gable Road. Given the potential for relatively heavy eastbound through movements at Gable Road and Millard Road, shifting the truck traffic and a substantial number of westbound left-turns south to Bennett Road would benefit US 30 by minimizing conflicting east-west turn movement demand (and green time) at Gable Road and Millard Road.

ODOT traffic and preliminary engineering staff have expressed concern about signalizing the US 30/Bennett Road intersection, citing safety concerns involving the relatively rural and high speed nature of US 30 at the intersection, the potential to increase rear-end crashes, the current low Bennett Road traffic volumes and a general desire to avoid rural traffic signals. ODOT's Road Safety Audit (RSA) project to be completed in 2011 is expected to focus in part on potential intersection treatments at Bennett Road.

GABLE/SYKES ROAD COUPLET

The conversion of Gable Road to a one-way westbound roadway between US 30 and Columbia Boulevard and Sykes Road to a one-way eastbound roadway between Columbia Boulevard and US 30 was considered as a potential solution to address the capacity needs identified at the US 30/Gable Road intersection. A preliminary review of the existing roadway network suggests that a one-way couplet system would severely limit access to the residential and commercial properties adjacent to Gable Road as well the St. Helens High School. This is primarily due to the lack of north/south roadways between Gable and Sykes Roads between Columbia Boulevard and St. Helens Street. Based on these observations it was determined that a one-way couplet system at this location is not feasible at this time.

Intersection and Roadway Recommendations for the Updated TSP

Based on review of the forecast intersection failures, the alternatives discussed above, and the desire to avoid substantial widening of Gable Road, the following mitigation measures are recommended for inclusion in the Updated TSP[10].

- Installation of a separate westbound left-turn lane at the US 30/Deer Island Road intersection.
- Signalize the US 30/Millard Road intersection, including installation of separate right-turn lanes on the east and westbound approaches to the intersection.
- Install a separate westbound right-turn lane at the US 30/Gable Road intersection, including related rail crossing widening.
- Provide an overpass near the US 30/Millard Road intersection in the long-term. The need for, and timing, of such an improvement will depend in part on the outcome of the future operations of the US 30/Bennett Road intersection (for example, if signalization is provided, Gable Road and Millard Road will benefit from trips re-routing to Bennett Road)

Although implementation is likely well beyond the planning horizon of the current TSP, the concept of a potential future overpass near the US 30/Pittsburg Road intersection should be preserved for future consideration.

[10] Before a signal can be installed on the State system, OAR 734-020-0440 requires a traffic engineering investigation that shows how traffic signal warrants and highway design and spacing standards are met with the proposed signal and how the proposed signal would improve the overall safety and operation of the intersection. A progression analysis would be required as per OAR 734-020-0470 for signals that will not meet the one half mile minimum spacing standard for traffic signals on State highways. Signals may not be installed until signal warrants are satisfied and the installation request and design has been approved by the State Traffic Engineer (OAR 734-020-0410).