

# Final Riverfront Connector Plan

## Design Options & Evaluation Report

ST. HELENS RIVERFRONT CONNECTOR PLAN  
November 30, 2018



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# INTRODUCTION

This document summarizes and illustrates an evaluation of preliminary options for the design of future improvements to streets and intersections within the St. Helens Riverfront Connector Plan Project Area. The project team evaluated and refined these recommendations based on input from City staff, the project advisory committee (COOLPPL) and other community members. Preferred designs and strategies for implementing them will be described in more detail in the Riverfront Connector Plan.

The Riverfront Connector Plan will complete the City's Business loop planning concept included in the US 30 & Columbia Blvd./St. Helens Street Corridor Master Plan, adopted in 2015, and the City's Transportation System Plan ("TSP"), adopted in 2011. The Riverfront Connector Plan will plan for a cohesive, multi-modal, inviting loop through the downtown, along the waterfront, and connecting to US 30.

The Project Area for the Riverfront Connector Plan is shown on page 5 and encompasses the Riverfront District, a portion of the Waterfront Redevelopment Project Area, and portions of Plymouth Street, Old Portland Road, Gable Road, McNulty Way, Millard Road, and US 30.

The Project Area is divided into two major sections: the Primary Project Area (corridor segments 1-4.2) and the Secondary Project Area (corridor segment 5). The Primary Project Area is the main focus of this plan, while the Secondary Project Area represents key alternative routes from US 30 to the Waterfront Redevelopment Project Area.

The Project Area is further divided into seven segments, which are shown on page 5 and addressed individually in the remainder of this document.

**Segment 1 – South 1<sup>st</sup> Street** (St. Helens Street to End of Existing South 1<sup>st</sup> Street)

**Segment 2.1 – Veneer Property** (End of existing South 1<sup>st</sup> Street to Lagoon Dam)

**Segment 2.2 – Plymouth Street** (Lagoon Dam to South 6<sup>th</sup> Street)

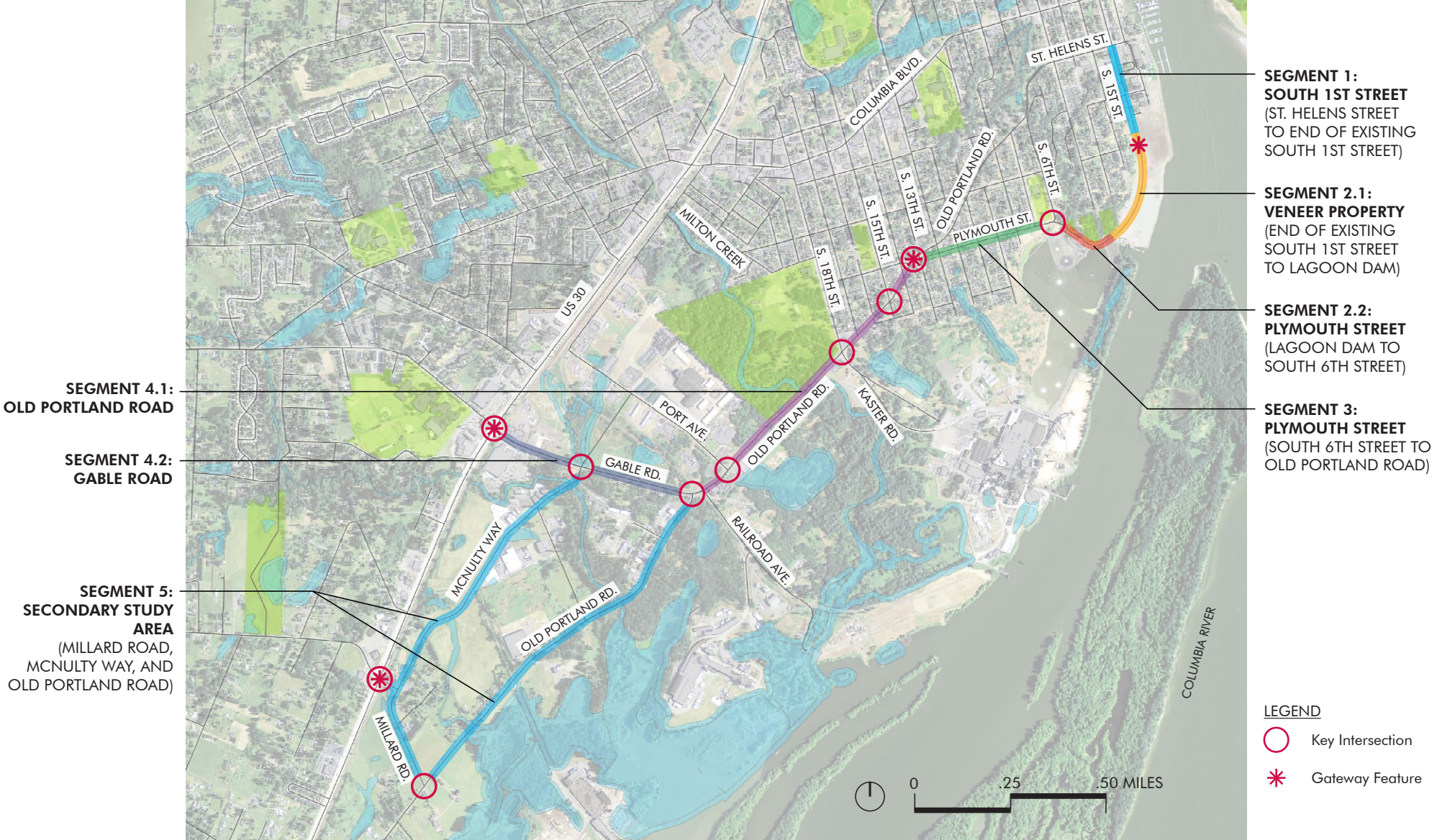
**Segment 3 – Plymouth Street** (South 6<sup>th</sup> Street to Old Portland Road)

**Segment 4.1 – Old Portland Road**

**Segment 4.2 – Gable Road**

**Segment 5 – Secondary Study Area** (Millard Road, McNulty Way and Old Portland Road)

# PROJECT AREA





# SUMMARY OF EVALUATION AND RECOMMENDATIONS

Following is a summary of recommendations for preferred design options based on the analysis described in the remainder of this report. In a small number of cases, more than one option performed well in our evaluation, and further discussion with the city, agency partners, and the broader community was required to identify a recommended design option. These recommendations reflect comments from members of the project advisory committee, the St. Helens Planning Commission and City Council, other community members. They may be refined further as part of preparation of the St. Helens Riverfront Connector Plan.

## Segment 1: South 1<sup>st</sup> Street

(St. Helens St. to End of Existing S. 1st St.)

Only one roadway cross-section was proposed and this option is recommended as the preferred alternative in large part due to the built-out nature of this segment, the character of existing facilities, consistency with other city plans, and feedback from the city. No key intersections were evaluated in this segment. This segment currently includes angled parking. The City may investigate use of reverse angled parking in this area in the future.

## Segment 2.1: Waterfront Area

(End of Existing S. 1<sup>st</sup> St. to Lagoon Dam)

Only one roadway cross-section was proposed and this option is recommended as the preferred alternative. The preferred design was established through an extensive planning and community engagement process as part of the St. Helens Waterfront Framework Plan. The city and project team agreed that this alternative did not need to be revisited as part of the current planning process. No key intersections were evaluated in this segment. The proposed design may be refined, depending on available right-of-way. If less than 80 feet of right-of-way is available, some elements of the design may be narrowed or eliminated.

A traffic calming circle also may be located in this segment. This feature could also serve as a way for drivers to turn around. The design of the traffic circle will depend on whether or not it includes a gateway feature and whether it will need to accommodate large trucks. The Riverfront Connector Plan will provide guidance about minimum design dimensions.

## Segment 2.2: Plymouth Street

(Lagoon Dam to Plymouth St.)

Only one roadway cross-section was proposed.

For the intersection of Plymouth Street and South 6<sup>th</sup> Street, Option A (stop controlled intersection, no splitter island) is recommended based on the evaluation. This option provides superior through-movement and mobility for those accessing properties on South 6<sup>th</sup>, and the lack of splitter island provides better emergency vehicle access.

## Segment 3: Plymouth Street

(South 6<sup>th</sup> St. to Old Portland Rd.)

Roadway cross section Option B (Sharrows and Multi-Use Path) is the recommended design for this section. This option has superior ratings for improved connectivity and access, improved bicycle and pedestrian safety and accessibility, improved street appearance, and the potential to incorporate sustainable design principles.

Of the four designs presented for the intersection of Old Portland Road and Plymouth Street, Options B, C, and D all scored highly in the evaluation, providing superior safety and mobility compared to Option A. Options C and D provide more potential to improve street appearance and incorporate sustainable design principles.

Based on discussion with members of the project advisory committee and other community members, a modified alternative is proposed as the preferred option. This roundabout allows for continued direct travel to both Old Portland Road and Plymouth Street. It has a smaller footprint than the other roundabout options evaluated, with less resulting impact on surrounding private properties and a lower cost to build compared to the earlier roundabouts studied.

## Segment 4.1: Old Portland Road

A modified version of Option C is the recommended design. Option C achieved the highest safety score for all modes, incremental development may be challenging. This option was refined based on feedback from the advisory committee, Planning Commission, City Council and other community members. The refined option places the landscaping strip between the roadway and cycletrack. The cycletrack will be separated from the pedestrian walkway by a curb or other means. Implementation of this option will require careful planning to allow for safe convenient transitions between this design and sections of the roadway that have undergone recent improvements.

At the intersection of Old Portland Rd. and Kaster Rd. Option B (roundabout) is the preferred design, allowing for through-movement in all directions without queueing at a signal. At the intersection of Old Portland Rd. and Railroad Ave., Option B is preferred. Option A is problematic from a transportation safety and mobility standpoint.

At the intersection of Old Portland Rd. and Gable Rd., Option A is the preferred long-term alternative. The City should monitor changes in travel performance after improvements to the US 30/Millard Road intersection are implemented and/or other measures are successful in encouraging more drivers to use Old Portland Road to access the Riverfront area. At the point that increased potential traffic on Old Portland Road warrants the investment in improvements to this intersection, this improvement may be evaluated further.

## Segment 4.2: Gable Road

Similar to Segment 4.1, a modified version of Option C is the recommended design. Option C achieved the highest safety score for all modes, though implementing a cycletrack facility through incremental development may be challenging. This option was refined based on feedback from the advisory committee, Planning Commission, City Council and other community members. The refined option places the landscaping strip between the roadway and cycletrack. The cycletrack will be separated from the pedestrian walkway by a curb or other means. Implementation of this option will require careful planning to allow for safe convenient transitions between this design and sections of the roadway that have undergone recent improvements.

Only one option was proposed for the intersections of Gable Road/McNulty Way and Gable Road/US 30.

## Segment 5: Secondary Study Area

(Millard Rd., McNulty Way & Old Portland Rd.)

The proposed designs for roadway cross sections and intersections in this area did not include alternatives to evaluate.

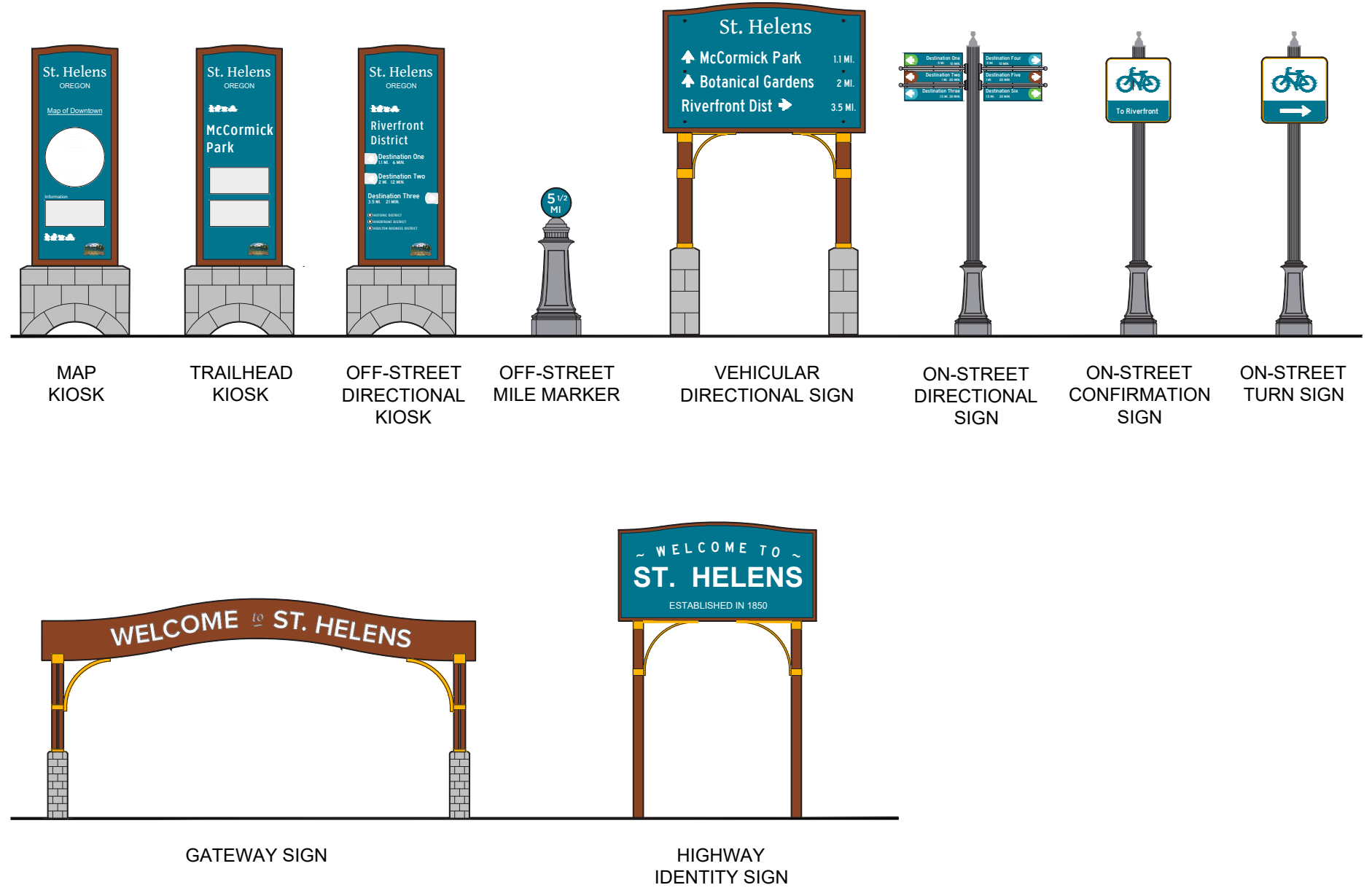
# SUMMARY OF WAYFINDING RECOMMENDATIONS

Wayfinding signage was evaluated and identified for the corridor based on guidance from the City of St. Helens Branding and Wayfinding Master Plan, adopted in October 2017. The wayfinding recommendations in this report are intended to comply with the placement and design standards identified in the Branding and Wayfinding Master Plan. For the purpose of this planning process, only wayfinding along the project corridor has been addressed. Future wayfinding efforts should consider existing and planned signage to develop a citywide wayfinding system that is consistent and complete.

The recommended wayfinding sign types along the project corridor include vehicular directional signs, on-street directional and confirmation signs for pedestrians and/or bicycles, trailhead kiosks at key entry points to local trails, and a map kiosk in the heart of the City's downtown Historic District. Signs directing users to one of the City's districts should include color-coded directional arrows per the Branding and Wayfinding Master Plan.

On-street directional signs are recommended at key intersections and decision points along the route. Whether on-street directional signs are recommended to be designed for vehicles or for bicycles and/or pedestrians depends on the presence of bicycle or pedestrian infrastructure along the road segment. The majority of on-street directional signs recommended could be designed for either bicycle or pedestrian use. Travel times on the recommended bicycle/pedestrian directional signs have been calculated for bicycle travel but could easily be recalculated for pedestrian travel if desired.

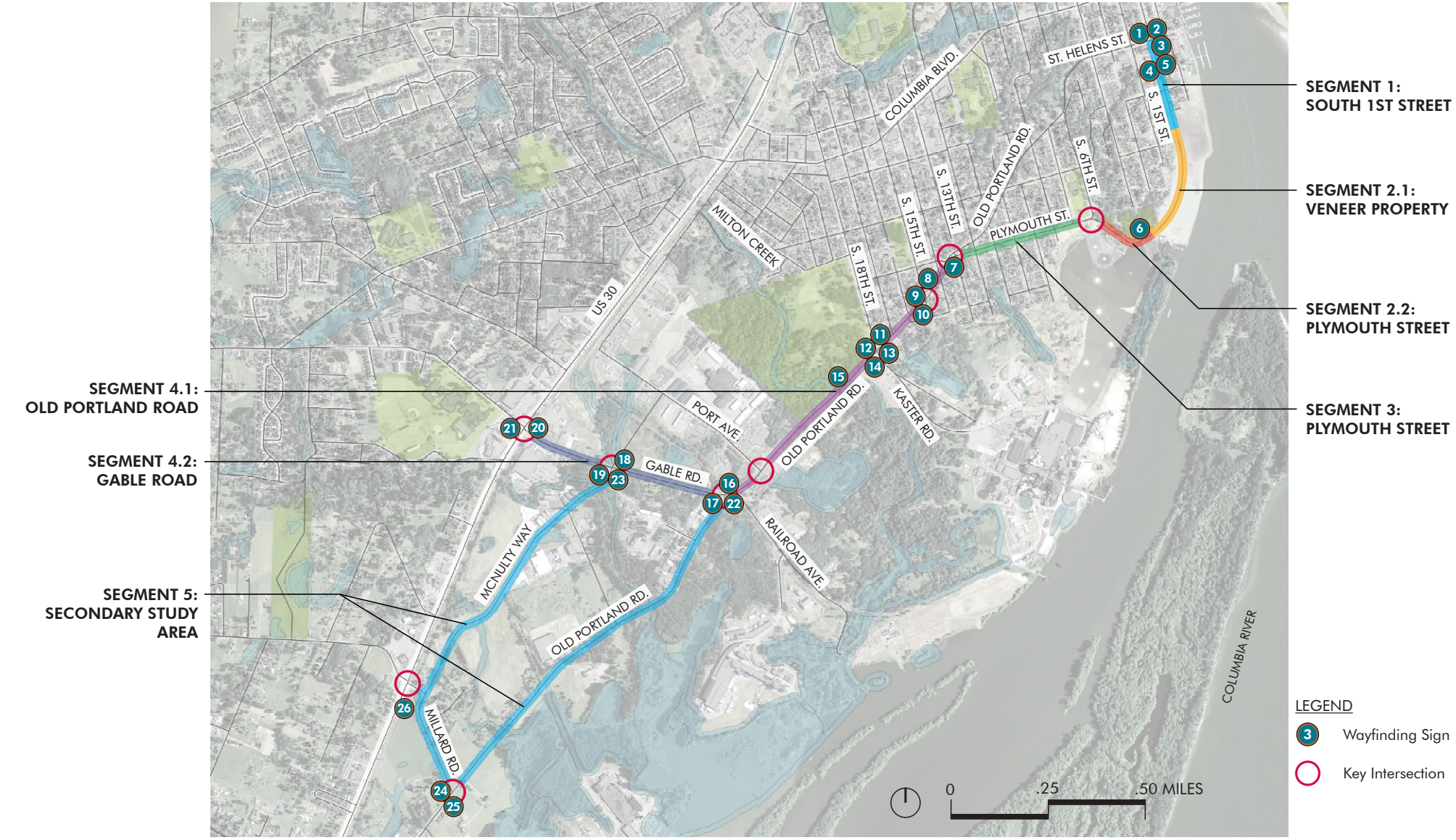
See Appendix 2 for the full table of wayfinding recommendations, including destinations, sign types, estimated distances and travel times, and installation locations.



Sign types identified in the 'City of St. Helens Branding & Wayfinding Master Plan' (2017)



Wayfinding Recommendations Summary						
(See Appendix 2 for full table including destinations)						
ID #	Corridor Segment	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing
1	1	Bicycle/Pedestrian	On-Street Directional	South 1st Street	St. Helens Street	North
2	1	Bicycle/Pedestrian	On-Street Directional	St. Helens Street	South 1st Street	East
3	1	Bicycle/Pedestrian	On-Street Directional	South 1st Street	St. Helens Street	South
4	1	Pedestrian	On-Street Directional	South 1st Street	Plaza Square	North
5	1	Pedestrian	Map Kiosk	South 1st Street	Plaza Square	East
6	2.2	Bicycle/Pedestrian	Trailhead Kiosk	Nob Hill Nature Park Trail	N/A	South
7	3	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	Plymouth Street	South
8	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 15th Street	North
9	4.1	Bicycle/Pedestrian	On-Street Directional	South 15th Street	Old Portland Road	North
10	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 15th Street	West
11	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 18th Street/Kaster Road	East
12	4.1	Bicycle/Pedestrian	On-Street Directional	South 18th Street	Old Portland Road	North
13	4.1	Bicycle/Pedestrian	On-Street Directional	Kaster Road	Old Portland Road	South
14	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 18th Street/Kaster Road	West
15	4.1	Bicycle/Pedestrian	Trailhead Kiosk	Old Portland Road	N/A	South
16	4.1	Bicycle	On-Street Confirmation	Old Portland Road	Gable Road	East
17	4.2	Bicycle	On-Street Confirmation	Gable Road	Old Portland Road	West
18	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	McNulty Way/Milton Way	East
19	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	McNulty Way/Milton Way	West
20	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	Highway 30	East
21	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	Highway 30	West
22	5	Vehicle	Vehicular Directional	Old Portland Road	Gable Road/Old Portland Road	South
23	5	Vehicle	Vehicular Directional	McNulty Way	Gable Road	South
24	5	Vehicle	Vehicular Directional	Millard Road	Old Portland Road	North
25	5	Vehicle	Vehicular Directional	Old Portland Road	Millard Road	South
26	5	Vehicle	Vehicular Directional	Highway 30	Millard Road	South



Wayfinding locations for entire study area (refer to table on previous page)

## WAYFINDING RECOMMENDATIONS SUMMARY

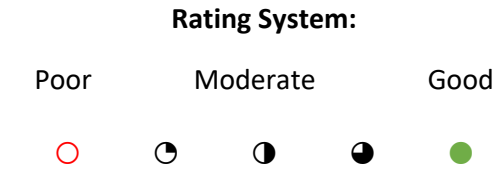


# EVALUATION OF DRAFT DESIGN OPTIONS

For each corridor segment, alternative road cross-section design and intersection options have been evaluated against a set of criteria which are based on the goals and objectives developed at the outset of this project.

The criteria are a mix of quantitative and qualitative measurements or assessments. Consistency with the criteria is described in the following sections of this report and is generally presented on a scale of 1 to 5, where 1 means poor and 5 means good.

Evaluation of each option is in relation to the group of options being evaluated, rather than against an absolute scale. All criteria are weighted equally for the purposes of the evaluation. Following is a list of the project goals and objectives and corresponding evaluation criteria.



## SUMMARY OF EVALUATION CRITERIA AND PROCESS

Guiding Principle	Specific Criteria	Notes
<b>Economy and Business Support</b>		
<i>Consistency with Previous Planning</i>	<ul style="list-style-type: none"> <li>Consistent with previous planning efforts</li> <li>Improves upon previous planning efforts with context sensitive solutions</li> <li>Consider timing of development related to emphasis of Plymouth vs Old Portland routes</li> </ul>	Transportation System Plan, Waterfront Framework Plan, other plans  Qualitative criteria
<i>Supports businesses and business districts</i>	<ul style="list-style-type: none"> <li>Improves awareness of business areas through wayfinding, signage, and gateway treatments</li> <li>Creates walkable and inviting business areas – can compare potential sidewalk widths and pedestrian access</li> </ul>	
<i>Supports customers, employees, and others by providing access</i>	<ul style="list-style-type: none"> <li>Improves multi-modal access to business areas – provides continuous, low stress, pedestrian and bicycle facilities</li> <li>Change to amount of on-street parking in business areas</li> </ul>	
<i>Relative Cost effectiveness</i>	<ul style="list-style-type: none"> <li>Relative price for construction and maintenance</li> <li>Will improvements have economic benefit in terms of supporting or encouraging redevelopment?</li> </ul>	

## SUMMARY OF EVALUATION CRITERIA AND PROCESS

Guiding Principle	Specific Criteria	Notes
<b>Transportation Safety &amp; Mobility</b>		
<i>Improved connectivity &amp; access</i>	<ul style="list-style-type: none"> <li>Improves motor vehicle access to business areas – improves traffic flow, increases roadway and/or intersection capacity</li> <li>Site-specific property impacts</li> <li>Opportunity to incorporate transit service and facilities</li> </ul>	Qualitative score
<i>Improved pedestrian/bicycle safety and accessibility</i>	<ul style="list-style-type: none"> <li>Improves pedestrian and bicycle access to business areas – provides continuous, low stress pedestrian and bicycle facilities</li> <li>Bicycle Level of Stress; Pedestrian Level of Stress</li> <li>Ease of transition between segments and intersections</li> </ul>	
<i>Through-movement and mobility</i>	<ul style="list-style-type: none"> <li>Improves multi-modal access to other parts of the city – increased street connectivity, increased ped/bike connectivity, increased access to multi-use paths and trails</li> <li>Volume/Capacity Ratio or similar metric</li> </ul>	
<i>Safety</i>	<ul style="list-style-type: none"> <li>Provides safety improvement at a location with a known safety issue</li> <li>Reduces potential for future crashes – providing separation between travel modes, other design strategies</li> </ul>	
<i>Emergency Vehicle accommodations</i>	<ul style="list-style-type: none"> <li>Provides additional routes for emergency vehicles</li> <li>Decreases response time for emergency vehicles</li> <li>Emergency vehicle accommodation (i.e. size of roadway)</li> </ul>	Qualitative score

Guiding Principle	Specific Criteria	Notes
<b>Connectivity &amp; Streetscape Aesthetics</b>		
<i>Improved street appearance</i>	<ul style="list-style-type: none"> <li>Qualitative score, based on amount of added landscaping and street trees, higher quality paving materials, space for added street furnishings, and for a proposed gateway element.</li> </ul>	Poor = very little improvement of street elements. Moderate = moderate improvement of multiple elements, or major improvement of one element. Good = major improvement of multiple elements, or a proposed gateway feature.
<i>Improved ped/bike connectivity between corridor and adjacent attractions</i>	<ul style="list-style-type: none"> <li>Separated (off-street) bike route</li> <li>Separated (not curb-tight) pedestrian route</li> <li>New bike and pedestrian connectivity through the corridor</li> <li>New bike and pedestrian connections to adjacent attractions</li> </ul>	Best score for options that create a long separated bike path and connect it to rest of city, and for new bike/pedestrian connections to attractions. (Ease of transition <u>between</u> segments is covered in <i>Improved pedestrian/bicycle safety and accessibility</i> .)
<i>Improves/affects quality of life</i>	<ul style="list-style-type: none"> <li>Improved health – more attractive options for walking and biking</li> <li>Composite of related criteria</li> </ul>	Connecting people and places, improved business/employment opportunity, improved appearance, improved safety, and lower bike/ped level of stress all help improve quality of life.
<i>Street designs catered to needs of particular segments</i>	<ul style="list-style-type: none"> <li>Provides context sensitive solution</li> <li>Consistency with Vision Statement for that segment</li> <li>Is it overkill? (too nice/too much of a "parkway", for example, for a fairly rural area?)</li> </ul>	Safety is part of the Vision Statements for each segment. Some options are a little less safe for bicyclists (in-street bike lanes on streets with higher speeds), otherwise all options seem like an appropriate level of improvement considering expected future development.
<i>Sustainable Design Strategies</i>	<ul style="list-style-type: none"> <li>Potentially incorporates storm water facilities (assuming feasibility based on underlying geology)</li> <li>Reduced impervious surface, or less than typical improvements would have.</li> </ul>	Only road sections with landscape strips and intersections with roundabouts (or which reconfigure roads to create new open space) have opportunity for stormwater facilities.

## SUMMARY OF EVALUATION CRITERIA AND PROCESS

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# SEGMENT 1 EVALUATION

Segment 1 connects the historic Riverfront District and downtown core of St. Helens to the future Waterfront Redevelopment area.

The current roadway configuration, with sidewalks and angled parking, is expected to remain on parts of the segment that are already built, unless redevelopment occurs in those areas. This segment currently includes angled parking. The City may investigate use of reverse angled parking in this area in the future.

Street furniture, ornamental lighting, and other design elements will identify this area as the heart of the Riverfront District.

Bicycle travel will be accommodated by shared-street markings (sharrows) on existing portions of the roadway.

## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET

## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET (St. Helens St. to End of Existing South 1<sup>st</sup> St.)

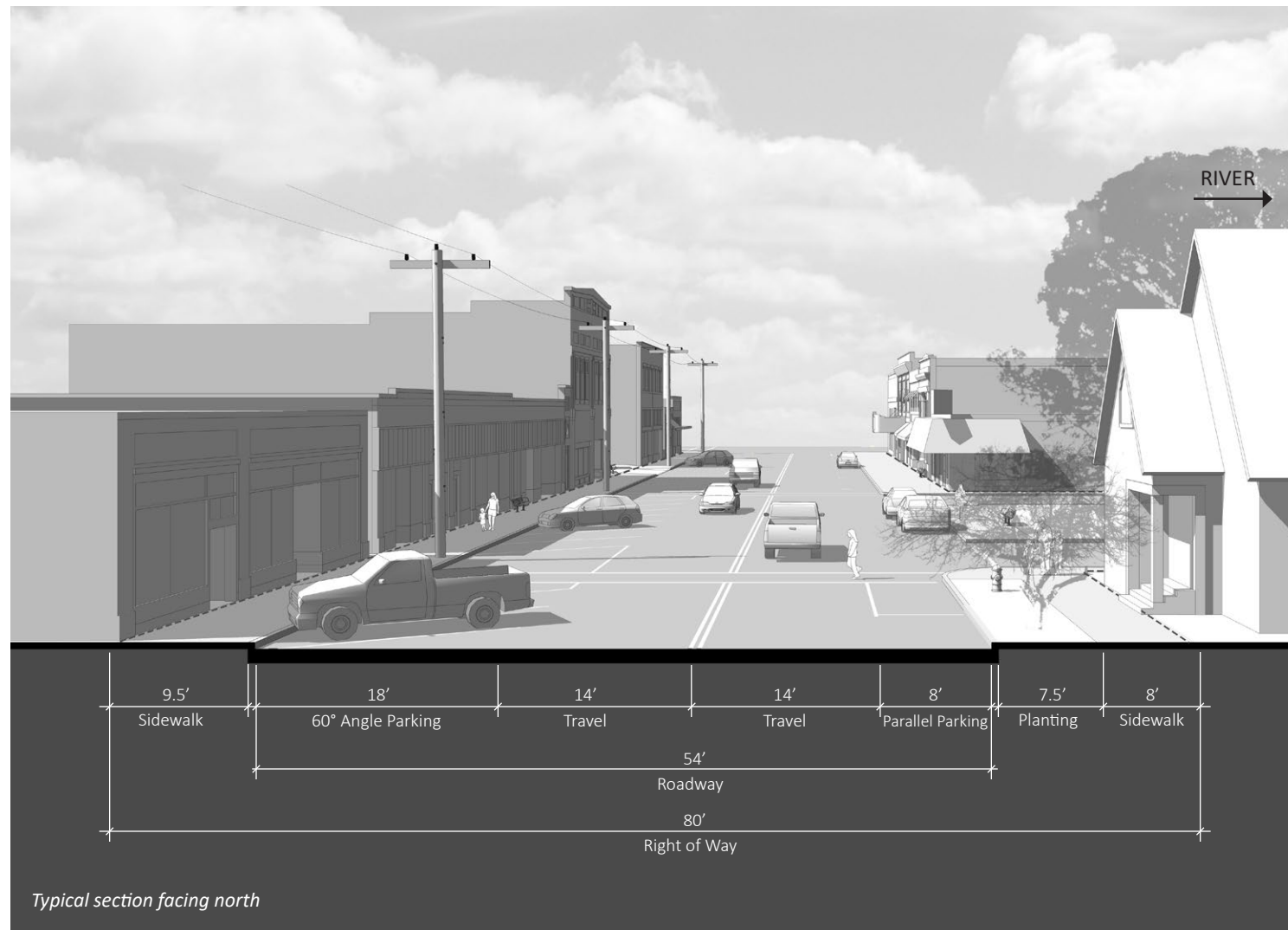


Segment 1 project area.



## Existing Road Section

- TSP Classification: Collector Street
- 80' wide ROW
- Approximately 1,200 linear feet
- On-street parking
- No bicycle facilities
- Wide sidewalks with few planters



## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET

## Potential Road Section

The proposed section for South 1<sup>st</sup> Street is similar to the existing street and includes sidewalks on both sides of the street, parallel parking on the east side, angled parking on the west side, and two travel lanes. Landscape planters are also proposed on both sides of the street with access across for pedestrians.

Painted sharrows will indicate that bicyclists share the roadway with vehicles on both sides of the street.

Sidewalk bulb-outs will provide a traffic calming effect, and shorten crossing distances for pedestrians. The bulb-outs will not reduce on-street parking, because those areas are already marked to prohibit parking in order to increase visibility for pedestrians and turning vehicles.

Depending on the final streetscape design, the number of on-street parking stalls should be the same or very close to the number of existing stalls.

As noted previously, this segment currently includes angled parking. The City may investigate use of reverse angled parking in this area in the future.



## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET



Potential Road Section



SEGMENT 1: SOUTH 1<sup>ST</sup> STREET

Potential Road Section



SEGMENT 1: SOUTH 1<sup>ST</sup> STREET



## Evaluation Summary Table

**Rating System:**

Poor      Moderate      Good



	Economy and Business Support				Transportation Safety and Mobility					Connectivity & Streetscape Aesthetics			
	Consistency with Previous Planning	Supports businesses and business districts	Supports customers, employees, and others by providing access	Relative Cost effectiveness	Improved connectivity & access	Improved pedestrian/bicycle safety and accessibility	Through-movement and mobility	Safety	Emergency Vehicle accommodations	Improved street appearance	Improved ped/bike connectivity	Street designs catered to needs of particular segments	Sustainable Design Strategies
Proposed Road Section	●	●	●	●	●	●	●	●	●	●	●	●	●

## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET

## Wayfinding Recommendations



Wayfinding locations for Segment 1

Wayfinding Recommendations: Segment 1		(See Appendix 2 for full table including destinations)			
ID #	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing
1	Bicycle/Pedestrian	On-Street Directional	South 1st Street	St. Helens Street	North
2	Bicycle/Pedestrian	On-Street Directional	St. Helens Street	South 1st Street	East
3	Bicycle/Pedestrian	On-Street Directional	South 1st Street	St. Helens Street	South
4	Pedestrian	On-Street Directional	South 1st Street	Plaza Square	North
5	Pedestrian	Map Kiosk	South 1st Street	Plaza Square	East

## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET

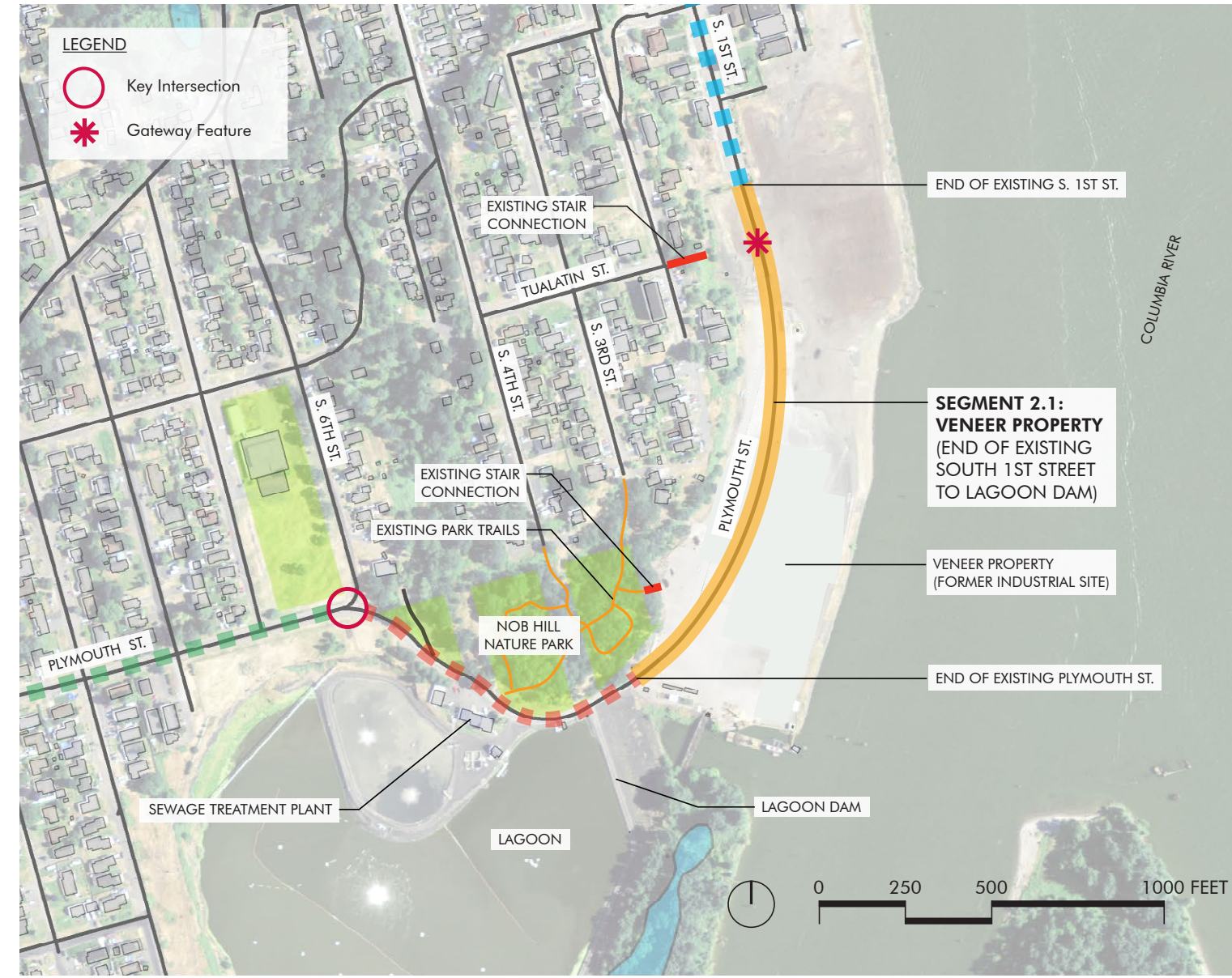
# SEGMENT 2.1 EVALUATION

Design of this segment was proposed in the Waterfront Framework Plan. It is intended to provide a safe and attractive pedestrian environment, stormwater management, bicycle access, as well as automobile parking and connectivity to future land uses in the waterfront area.

Segment 2.1 is a new connection from the historic downtown and Riverfront District south to Plymouth Street and beyond.

# SEGMENT 2.1: VENEER PROPERTY

# SEGMENT 2.1: VENEER PROPERTY (End of Existing South 1<sup>st</sup> St. to Lagoon Dam)



Segment 2.1 project area



### Existing Conditions

TSP Classification: Collector Street  
 No existing ROW  
 Approximately 1,500 lineal feet  
 No road improvements

This segment travels through a relatively flat, currently undeveloped area with few to no physical constraints. Future improvements will need to be coordinated with future redevelopment in the Waterfront Redvelopment area.



### SEGMENT 2.1: VENEER PROPERTY

### Potential Road Section

The proposed section for this segment is generally consistent with previous planning work conducted for the City's Waterfront Framework Plan.

Compared to Segment 1, this section has parallel parking on both sides instead of angle parking, and adds bicycle lanes.

This road is classified by the St. Helens TSP as a Collector, but to be consistent with the Waterfront Framework Plan, the proposed section is very similar to the TSP's "Minor Arterial (Two-Way Downtown)" section.

Sidewalk bulb-outs at crossings will shorten crossing distances for pedestrians and provide a traffic calming effect.

Transitions from bicycle lanes in Segment 2.1 to shared travel lanes in Segment 1 and the multi-use path in Segment 2.2 will need to be considered.

The proposed design ultimately may be refined as part of future redevelopment processes, depending on available right-of-way. If less than 80 feet of right-of-way is available, some elements of the design may be narrowed and/or the dedicated bicycle lane may be replaced with sharrows indicating a shared vehicle/bicycle lane.

(Continued on page 28)

### SEGMENT 2.1: VENEER PROPERTY





(Continued from page 27)

Element Width  
 Travel lanes.....10-12'  
 Bike lanes.....0-6'  
 Parallel parking.....8'  
 Planting strips.....4-6'  
 Sidewalks.....8'  
 Total.....60-80'

A traffic calming circle also may be located in this segment. This feature could also serve as a way for drivers to turn around. The design of the traffic circle will depend on whether or not it includes a gateway feature and whether it will need to accommodate large trucks. The Riverfront Connector Plan will provide guidance about minimum design dimensions.

At some point within this segment, the street name will change from S. 1st Street to Plymouth Street. This location will be determined as development and/or roadway construction occurs.

**SEGMENT 2.1: VENEER PROPERTY**

**Evaluation Summary Table**

**Rating System:**



Proposed Road Section	<b>Economy and Business Support</b>				<b>Transportation Safety and Mobility</b>					<b>Connectivity &amp; Streetscape Aesthetics</b>			
	<i>Consistency with Previous Planning</i>	<i>Supports businesses and business districts</i>	<i>Supports customers, employees, and others by providing access</i>	<i>Relative Cost effectiveness</i>	<i>Improved connectivity &amp; access</i>	<i>Improved pedestrian/bicycle safety and accessibility</i>	<i>Through-movement and mobility</i>	<i>Safety</i>	<i>Emergency Vehicle accommodations</i>	<i>Improved street appearance</i>	<i>Improved ped/bike connectivity</i>	<i>Street designs catered to needs of particular segments</i>	<i>Sustainable Design Strategies</i>
Proposed Road Section	●	●	●	◐	●	◐	●	◐	●	●	◐	●	◐

**SEGMENT 2.1: VENEER PROPERTY**

## SEGMENT 2.2 EVALUATION

Several alternative designs have been considered by the project team to provide mobility for drivers, pedestrians and bicyclists while working within the constrained conditions in this segment. Ultimately, the team has identified one proposed approach based on the following objectives:

**Provide a dedicated facility for pedestrians on at least one side of the road.**

Given that alternate routes through the Nob Hill Nature Park would not meet accessibility requirements for people with disabilities, it is important to have an accessible pedestrian facility on this segment.

**Keep costs reasonable.**

Extensive blasting or moving wastewater treatment vaults is likely to be very expensive. The proposed section should fit within existing available area where possible.

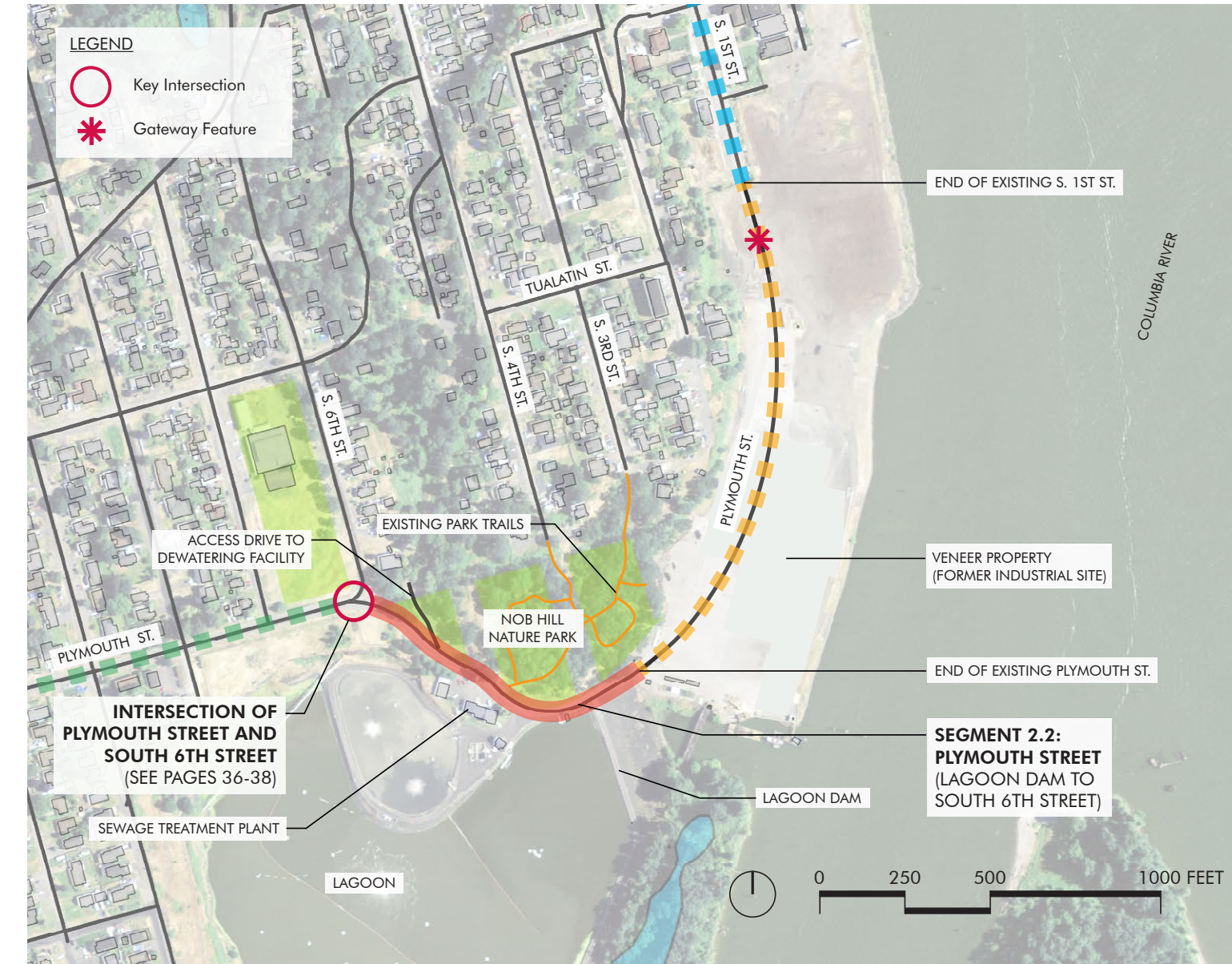
**Provide reasonable options for cyclists.**

Providing a dedicated facility for cyclists in the form of a multi-use pathway on the north (uphill) side of the road will provide a separated route for cyclists where they are moving more slowly. A shared pathway for bicyclists and pedestrians traveling uphill is safer, compared to doing so in the downhill direction. Providing a shared route with vehicles on the south (downhill) side of the road will make efficient use of limited space and allow bicyclists and vehicles to share the roadway where their speeds are more similar.

**Allow flexibility where conditions vary.**

A landscaping strip is recommended where space allows on the north side of the road. The width of this area will increase where more area is available. A landscaping strip will enhance the appearance of the road and enhance comfort and safety for pedestrians and bicyclists using the shared pathway.

## SEGMENT 2.2: PLYMOUTH STREET



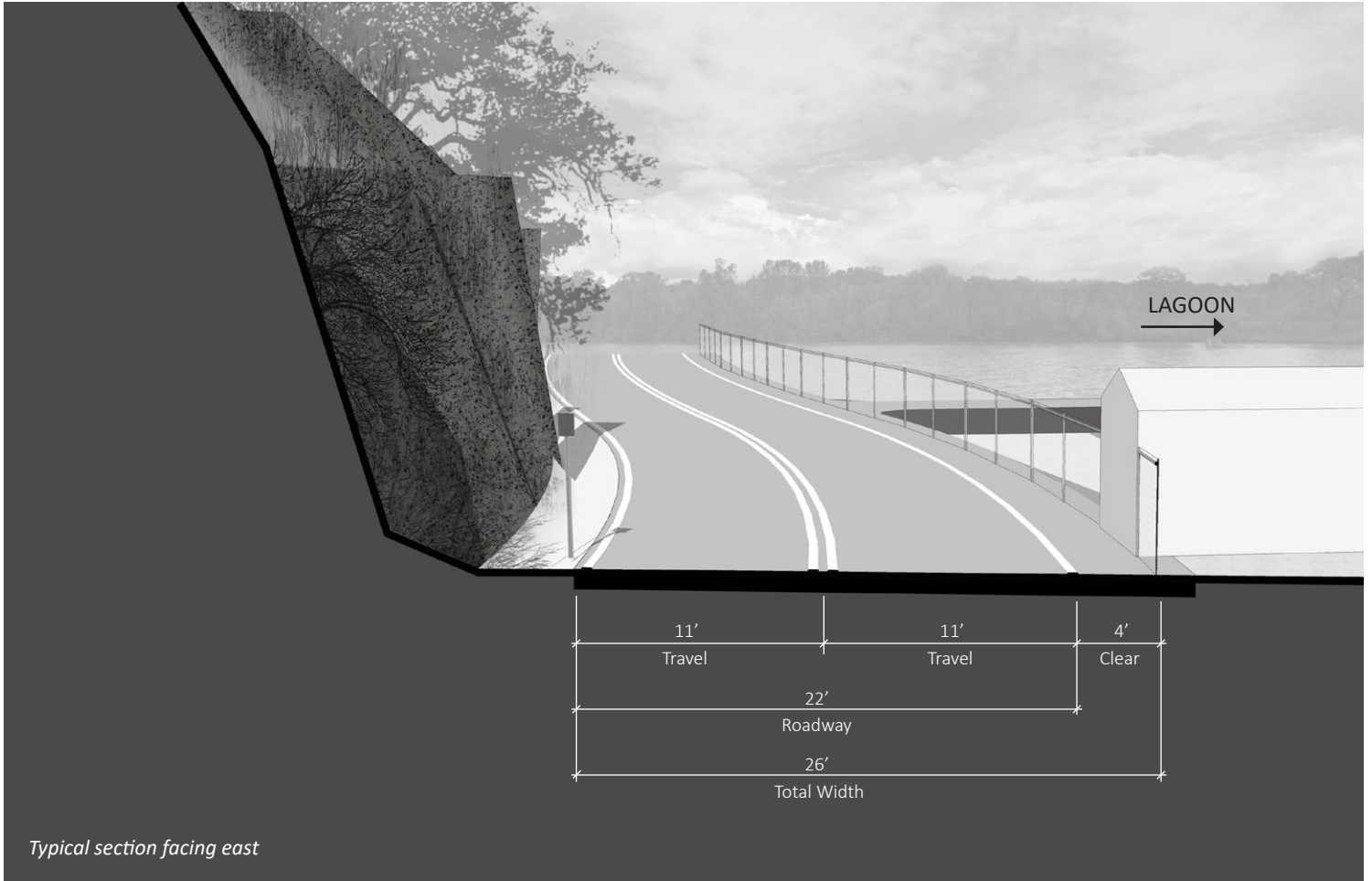
Segment 2.2 project area



### Existing Road Section

- TSP Classification: Collector Street
- No existing ROW
- Approximately 1,100 linear feet
- No bike facilities
- No sidewalks

Plymouth Street through Segment 2.2 has a constrained available width of approximately 26' to 34' due to topography, basalt outcrops, improvements at the sewage treatment plant to the south, and the dewatering facility drive to the north. Approximately 40' or more width may be usable with some combination of retaining walls, fill, blasting, and/or moving some treatment plant vaults or other improvements.

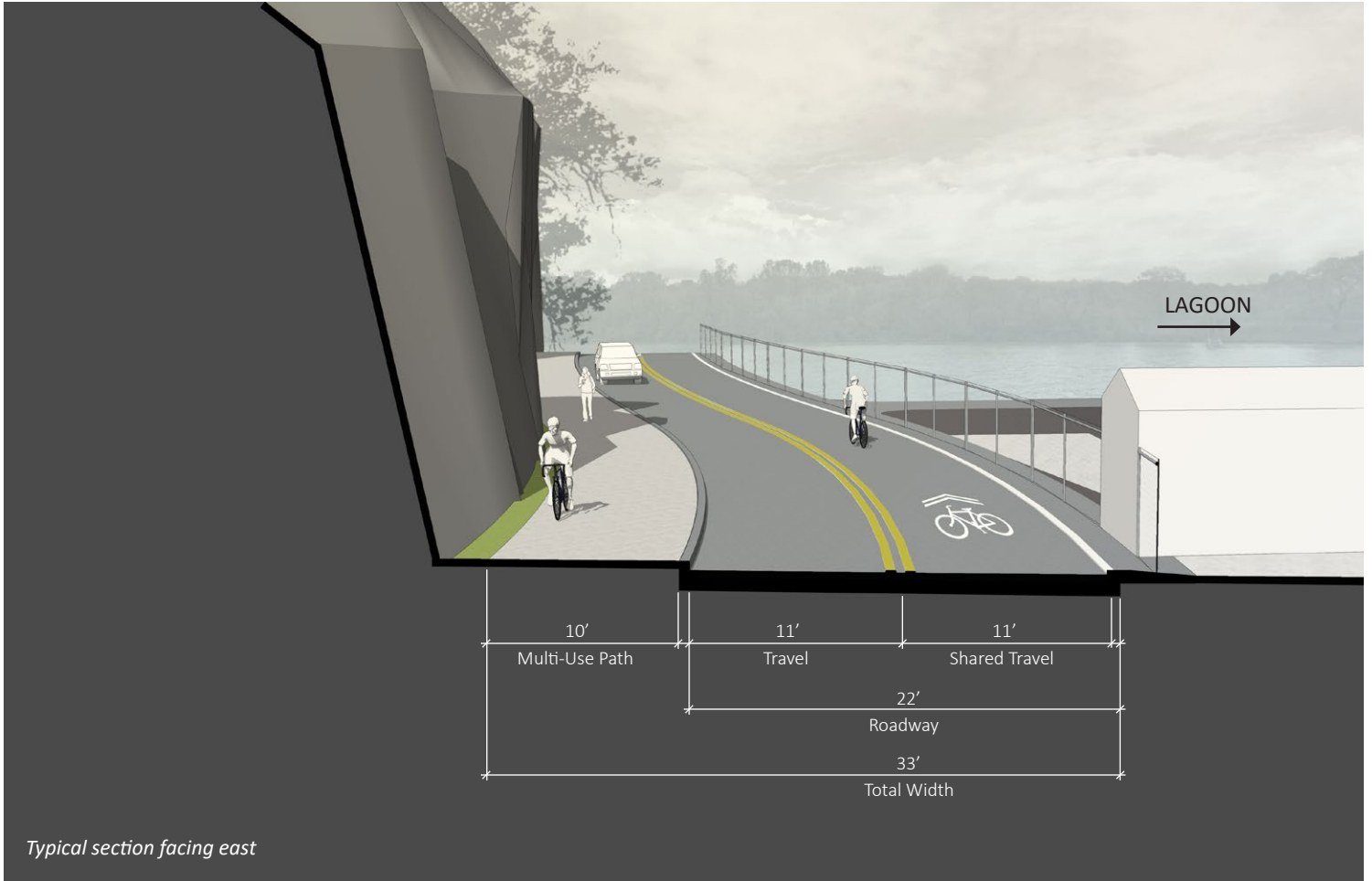


### SEGMENT 2.2: PLYMOUTH STREET

### Potential Road Section

The proposed road section contains two 11' travel lanes, one of which is shared with bicycle travel (the east-bound/southern lane), and a 10' multi-use path on the north side of the road, separated from the travel lanes by a landscape strip where space allows (varying in size depending on available space).

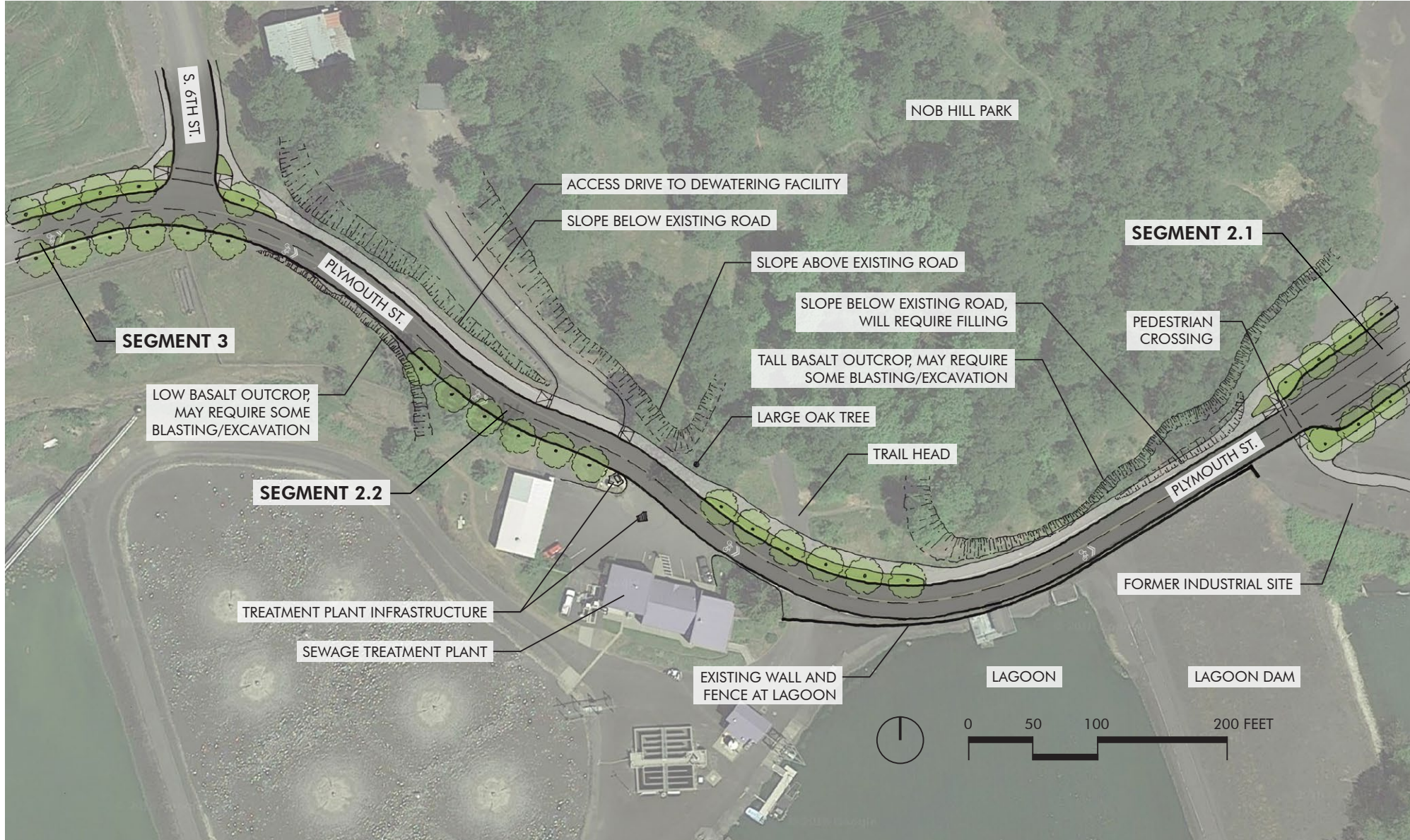
Implementation of the proposed road section will need to consider pedestrian crossings where the south side sidewalk ends at the south end of Segment 2.1, and how bicycle facilities will transition to adjacent segments.



### SEGMENT 2.2: PLYMOUTH STREET



### Potential Plan



### SEGMENT 2.2: PLYMOUTH STREET

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### Intersection Evaluation

The Plymouth Street/S. 6<sup>th</sup> Street intersection is located at the crest of a vertical curve and on the outside of a horizontal curve along Plymouth Street, which together limit sight distance. There is currently no stop sign at the southbound approach to the intersection or warning signs at the eastbound approach to alert motorists of the horizontal/vertical curve. The following design options were developed for further consideration.



Existing conditions (image: Google Earth)

### INTERSECTION: PLYMOUTH STREET & SOUTH 6<sup>TH</sup> STREET

### Option A: Stop Control

- Realigns the southbound approach to create a “T” intersection with Plymouth Street.
- Provides a stop sign at the southbound approach from S. 6<sup>th</sup> Street to Plymouth Street.
- Provides curve warning signs on Plymouth Street.



### INTERSECTION: PLYMOUTH STREET & SOUTH 6<sup>TH</sup> STREET



**Option B:  
Right in/Right Out**

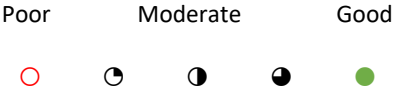
Includes the same improvements as Option A with the addition of a splitter island to limit turn movements to right-in and right-out. Residents can use S. 7<sup>th</sup> Street to complete eastbound and southbound left-turn movements.



**INTERSECTION: PLYMOUTH STREET & SOUTH 6<sup>TH</sup> STREET**

**Evaluation Summary Table**

**Rating System:**



Proposed Road Section	Economy and Business Support				Transportation Safety and Mobility					Connectivity & Streetscape Aesthetics			
	Consistency with Previous Planning	Supports businesses and business districts	Supports customers, employees, and others by providing access	Relative Cost effectiveness	Improved connectivity & access	Improved pedestrian/bicycle safety and accessibility	Through-movement and mobility	Safety	Emergency Vehicle accommodations	Improved street appearance	Improved ped/bike connectivity	Street designs catered to needs of particular segments	Sustainable Design Strategies
Proposed Road Section	●	●	●	●	○	○	○	○	○	○	●	●	●
Plymouth Street/ South 6 <sup>th</sup> Street	Option A	●	●	●	●	○	○	○	○	○	○	●	○
	Option B	●	○	○	○	○	○	○	○	○	○	●	○

**SEGMENT 2.2: PLYMOUTH STREET**



# Wayfinding Recommendations



- LEGEND**
- 3 Wayfinding Sign
  - Key Intersection

Wayfinding locations for Segment 2.2

Wayfinding Recommendations: Segment 2.2		(See Appendix 2 for full table including destinations)			
ID #	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing
6	Bicycle/Pedestrian	Trailhead Kiosk	Nob Hill Nature Park Trail	N/A	South

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# SEGMENT 3 EVALUATION

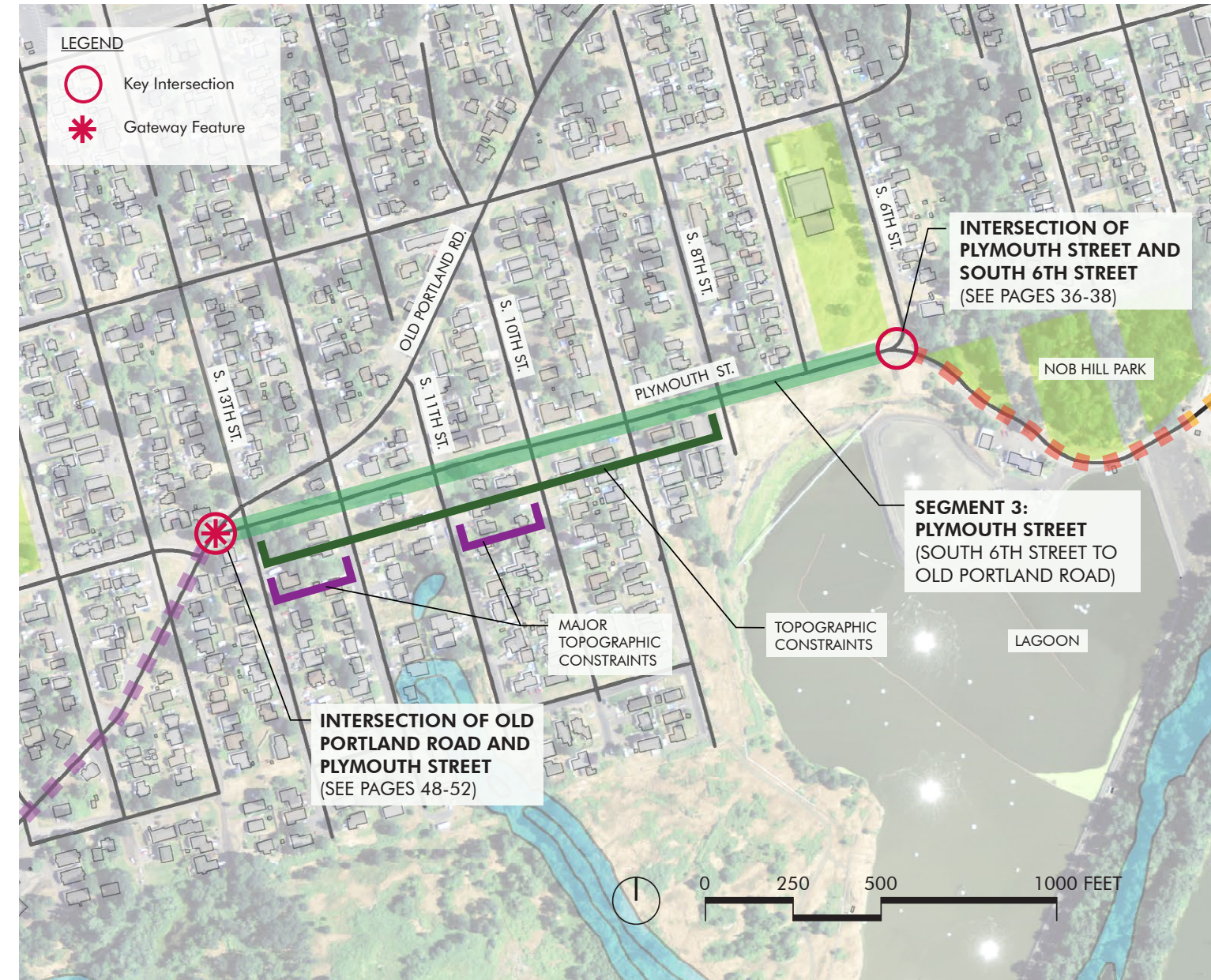
Segment 3 connects Segment 2.2 to Old Portland Road along a straight section of Plymouth Street through a largely developed residential area.

Topographic constraints exist within the ROW on five of the seven blocks in this segment. Approximately 48'-50' of width is available between S. 8<sup>th</sup> and S. 10<sup>th</sup> Streets, and between S. 11<sup>th</sup> and S. 12<sup>th</sup> Streets, or wider with retaining walls. Approximately 42'-45' of width is available between S. 10<sup>th</sup> and S. 11<sup>th</sup> Streets, and between S. 12<sup>th</sup> and S. 13<sup>th</sup> Streets, or wider with retaining walls.

Plymouth Street is already off-center near S. 11<sup>th</sup> St. due to topography. This segment may need a three-lane road section for turn lanes at the west end of Segment 3, depending on the proposed intersection layout for Plymouth Street and Old Portland Road.

The overall approach for this section is to provide continuous pedestrian and bicycle facilities along the north side of Plymouth Street. Two possible options have been identified to implement this approach. Where a sidewalk is provided on the south side of the road, pedestrian crossings will be needed where those sections end. Both options propose to provide a sidewalk on the south side only between S. 8<sup>th</sup> St. and S. 10<sup>th</sup> St.

## SEGMENT 3: PLYMOUTH STREET

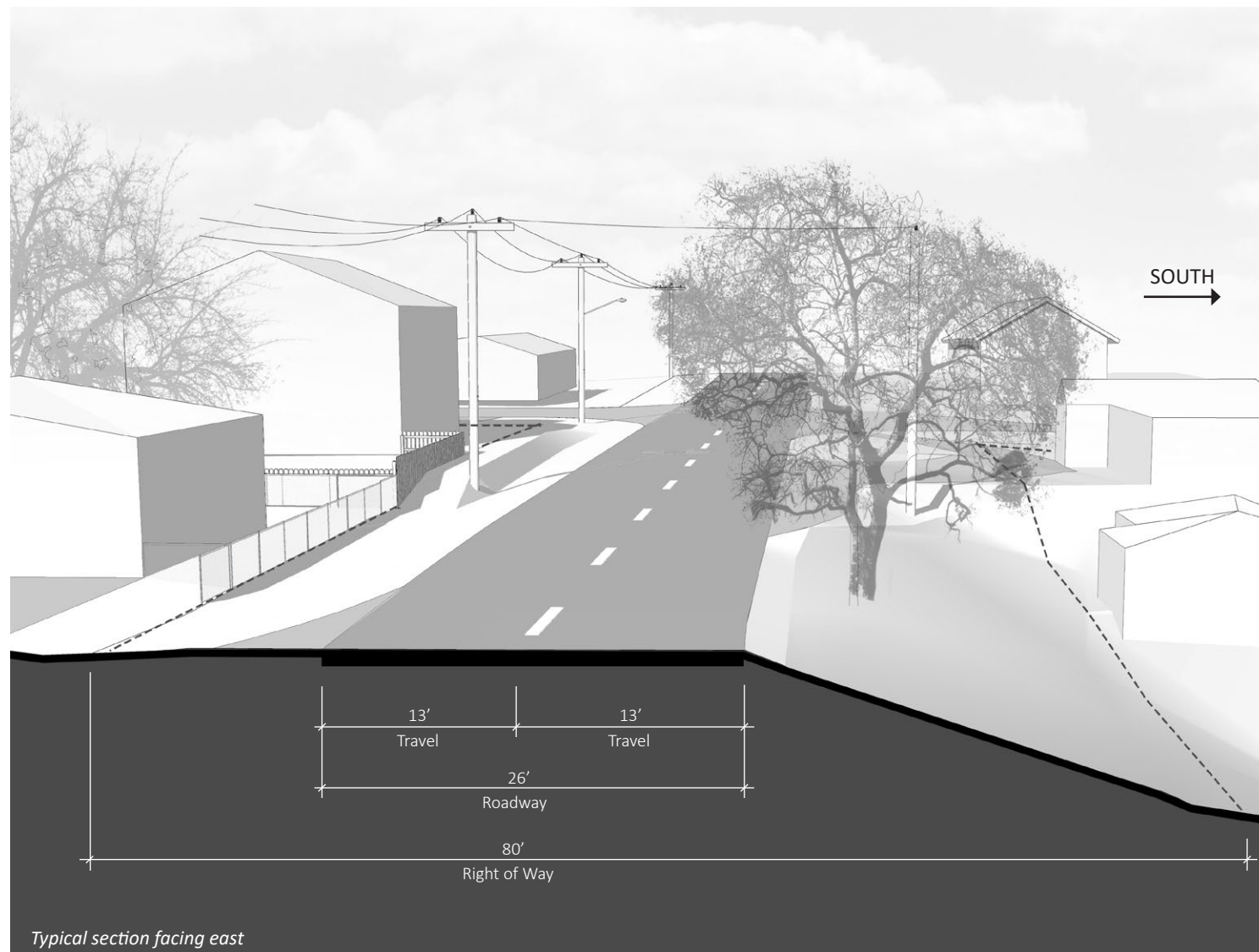


Segment 3 project area



## Existing Road Section

- TSP Classification: Collector Street
- 80' wide ROW
- Approximately 1,950 linear feet
- No bike facilities
- No sidewalks



## SEGMENT 3: PLYMOUTH STREET

## Road Section: Option A Bicycle Lanes

This option would include bicycle lanes on both sides of the street and a sidewalk along the north side of the street.

The sidewalk on the south side of the street would only occur between S. 8<sup>th</sup> St. and S. 10<sup>th</sup> St., where there are residences and where space for a sidewalk is available.

The bicycle lane and sidewalk on the north side would need to transition to the multi-use path in Section 2.2 at S. 6<sup>th</sup> Street and the bicycle lane on the south side would transition to a shared bicycle and auto travel lane at S. 6<sup>th</sup> Street.

This road section would displace the existing utility poles, which will need to be moved.



## SEGMENT 3: PLYMOUTH STREET

**Road Section: Option B**  
**Sharrows & Multi-Use Path**

This option would continue the multi-use path and landscaping strip from Segment 2.2 along the north side of Plymouth. On the south side of Plymouth, a sidewalk could be provided where available width allows and where residences would make use of it - between S. 8<sup>th</sup> and S. 10<sup>th</sup> Streets.

This road section would displace the existing utility poles, which will need to be moved.



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### Intersection Evaluation

The intersection of Old Portland Road and Plymouth Street presents many challenges, including visibility issues, steep grades and curves, several closely-spaced intersections, and potential impacts to private property associated with improvements.

Several options for improving this intersection were identified and evaluated. The project team narrowed them down to four options which are illustrated and described in the following pages.

Based on further analysis and discussion with members of the advisory committee, Planning Commission, City Council and other community members, the project team developed a new preferred option shown in the Recommendations section of this report.

This new roundabout design allows for continued direct travel to both Old Portland Road and Plymouth Street. It has a smaller footprint than the other roundabout options evaluated, with less resulting impact on surrounding private properties and a lower cost to build compared to the earlier roundabouts studied.



Existing conditions (image: Google Earth)

### INTERSECTION: OLD PORTLAND ROAD & PLYMOUTH STREET

### Option A: Re-Align Plymouth St.

- Realigns Plymouth Street to intersect with Old Portland Road at S. 13<sup>th</sup> Street (north).
- Old Portland Road is emphasized as the through-route.
- S. 13<sup>th</sup> Street (south) is realigned to intersect with Plymouth Street.
- Optional component: add a cul-de-sac on S. 14<sup>th</sup> Street (north) to separate it from Old Portland Road.
- Some impacts to private property but no direct impact to existing homes or other structures.
- This option does not meet mobility standards under future traffic conditions. However, it could be developed as an interim treatment to address existing safety issues.



### INTERSECTION: OLD PORTLAND ROAD & PLYMOUTH STREET



**Option B:  
Re-Align Old Portland Rd.**

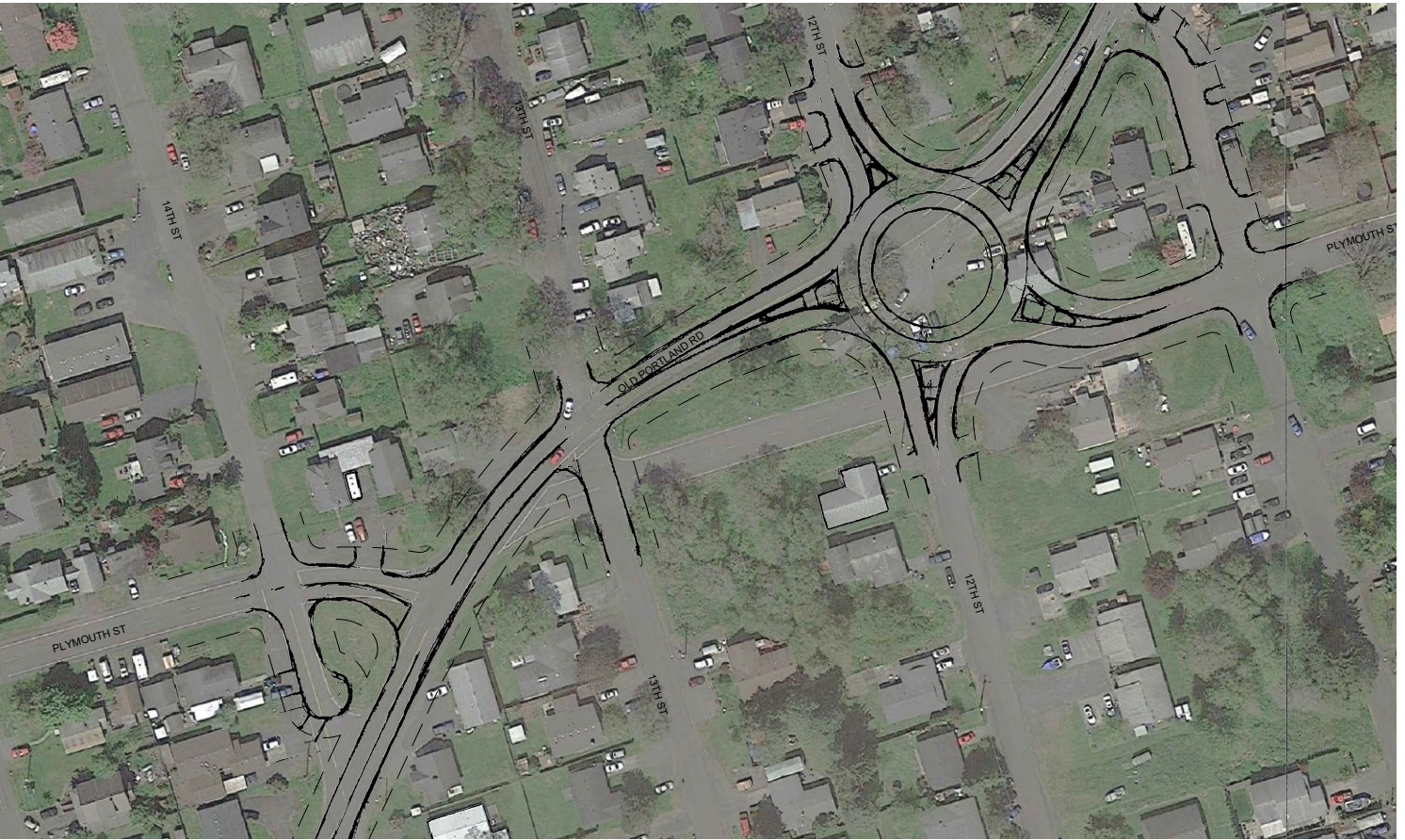
- Realigns Old Portland Road to emphasize Plymouth Street as the through-route.
- The north leg of Old Portland Road is realigned to intersect with Plymouth Street at S. 12<sup>th</sup> Street, and part of the prior Old Portland Road alignment is vacated.
- S. 12<sup>th</sup> Street is realigned to intersect with the new Old Portland Road alignment at a 'T'.
- Optional component: disconnect the north leg of S. 14<sup>th</sup> Street from Old Portland Road, and realign the south leg to intersect Old Portland Road.
- Impacts one property, including an existing dwelling; this property has been purchased by the City.



**INTERSECTION: OLD PORTLAND ROAD & PLYMOUTH STREET**

**Option C:  
Five-Leg Roundabout**

- Adds a five-legged roundabout, with equal emphasis on Old Portland Road and Plymouth Street.
- Part of the prior Plymouth Street alignment is vacated.
- Optional components: Disconnect the north leg of S. 14<sup>th</sup> Street from Old Portland Road and re-align the south leg to intersect at a 'T'.
- Impacts multiple properties and existing dwellings; one of these properties has been purchased by the City.

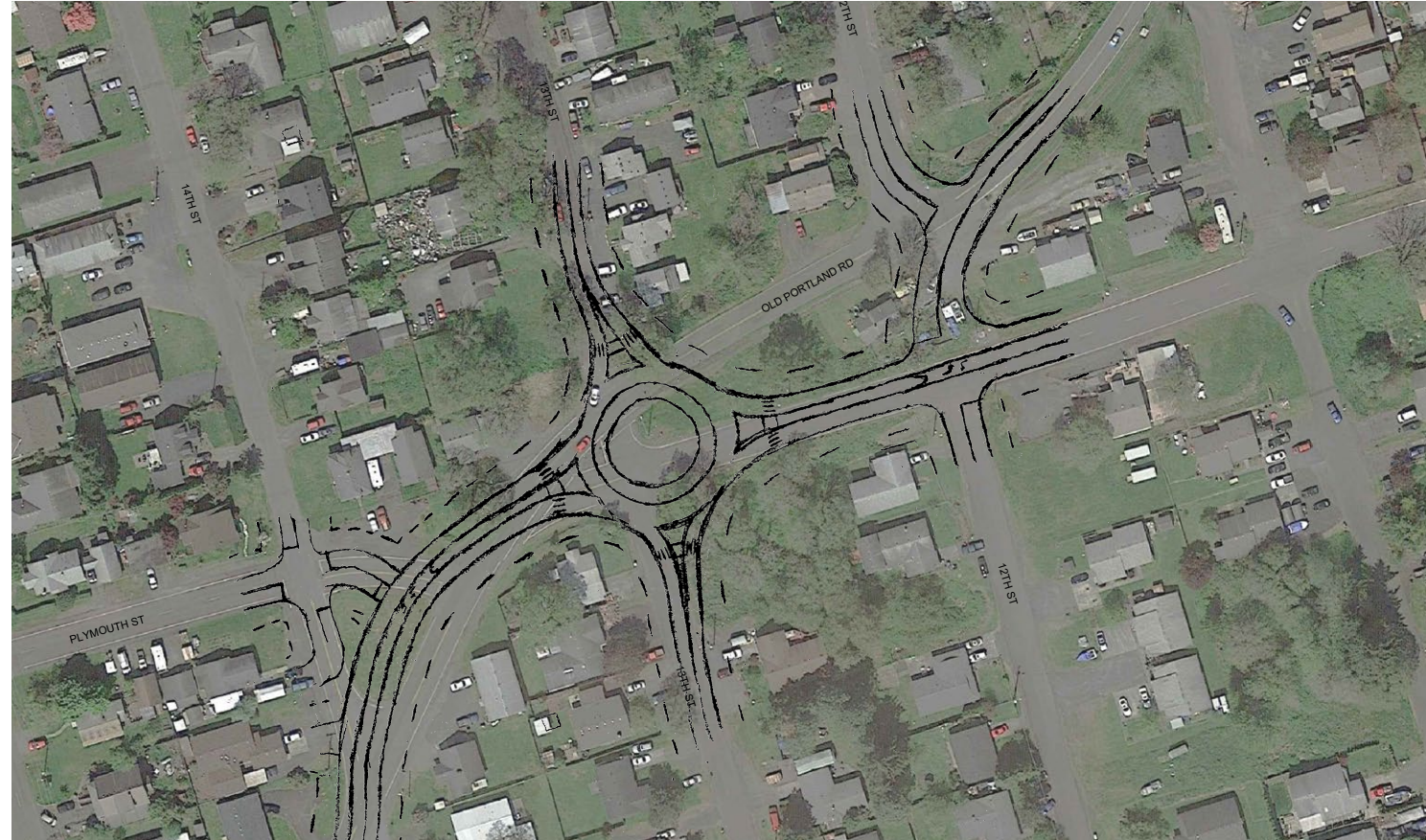


**INTERSECTION: OLD PORTLAND ROAD & PLYMOUTH STREET**



### Option D: Four-Leg Roundabout

- Adds a four-legged roundabout and emphasizes Plymouth Street.
- The north leg of Old Portland Road is realigned to intersect with Plymouth Street at a 'T'.
- Part of the prior Old Portland Road alignment is vacated.
- Impacts multiple properties and one existing dwelling; one affected property is owned by the City.
- Vertical challenges on the south side of the roundabout would result in additional costs not captured in planning-level analysis and adds potential for property impacts.



## INTERSECTION: OLD PORTLAND ROAD & PLYMOUTH STREET

### Evaluation Summary Table

**Rating System:**



		<b>Economy and Business Support</b>				<b>Transportation Safety and Mobility</b>				<b>Connectivity &amp; Streetscape Aesthetics</b>				
		<i>Consistency with Previous Planning</i>	<i>Supports businesses and business districts</i>	<i>Supports customers, employees, and others by providing access</i>	<i>Relative Cost effectiveness</i>	<i>Improved connectivity &amp; access</i>	<i>Improved pedestrian/bicycle safety and accessibility</i>	<i>Through-movement and mobility</i>	<i>Safety</i>	<i>Emergency Vehicle accommodations</i>	<i>Improved street appearance</i>	<i>Improved ped/bike connectivity</i>	<i>Street designs catered to needs of particular segments</i>	<i>Sustainable Design Strategies</i>
Road Section Options	Option A	●	●	●	●	●	●	●	●	●	●	●	●	●
	Option B	●	●	●	●	●	●	●	●	●	●	●	●	●
Plymouth Street/Old Portland Road	Option A	●	●	●	●	●	●	●	●	●	●	●	●	●
	Option B	●	●	●	●	●	●	●	●	●	●	●	●	●
	Option C	●	●	●	●	●	●	●	●	●	●	●	●	●
	Option D	●	●	●	●	●	●	●	●	●	●	●	●	●

## SEGMENT 3: PLYMOUTH STREET



### Wayfinding Recommendations



- LEGEND**
- 3 Wayfinding Sign for Segment 3
  - 6 Wayfinding Sign for other segments
  - Key Intersection

Wayfinding locations for Segment 3

Wayfinding Recommendations: Segment 3		(See Appendix 2 for full table including destinations)			
ID #	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing
7	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	Plymouth Street	South

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### SEGMENT 3: PLYMOUTH STREET



## SEGMENT 4.1 EVALUATION

This segment connects Plymouth Street to Gable Road, transitioning from residential neighborhoods in the East to park and industrial land. The lack of existing sidewalks or pathways in the majority of this segment, coupled with higher traffic speeds necessitate improved pedestrian facilities.

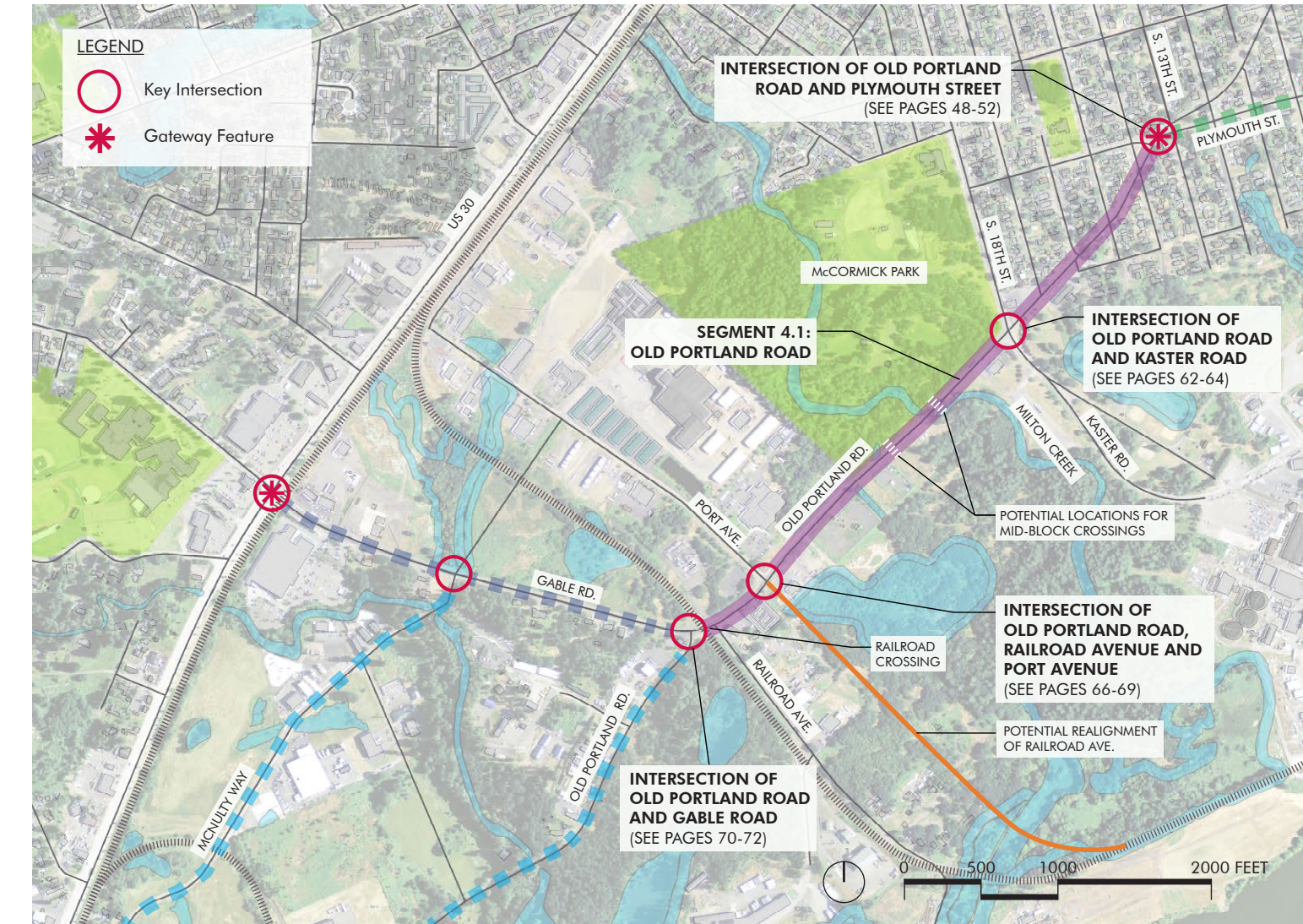
There are few intersections along a portion of this segment, posing the potential need for multiple mid-block crossings for pedestrians. Lower travel speeds or separated bicycle facilities will improve safety for bicyclists.

The options for this segment show one travel lane in each direction and various ways to accommodate pedestrian and bicycle movement.

There is a railroad crossing on this segment at the intersection of Old Portland Road and Railroad Avenue. The current roadway has two travel lanes, bicycle lanes only west of Kaster Road, and drainage ditches on either side of the roadway. Speed limits are posted at 40 mph west of the Milton Creek Bridge, and 30 mph east of the bridge where the land use is primarily residential. Pedestrian facilities in this area are limited.

Development within this segment is a mixture of light industrial buildings, a public park, an institutional facility, and several single-family homes. McCormick Park borders the corridor along Old Portland Road, although there is no public vehicle access from Old Portland Road. One gated maintenance access drive does exist. There is also a pedestrian path connection into the park on the east side of the Milton Creek bridge, which has potential to become a trailhead.

The Columbia County Jail and Sheriff's Office are also located near this area and are set back 150' from the road. Several commercial businesses are located near the intersection of Old Portland Road and Gable Road.



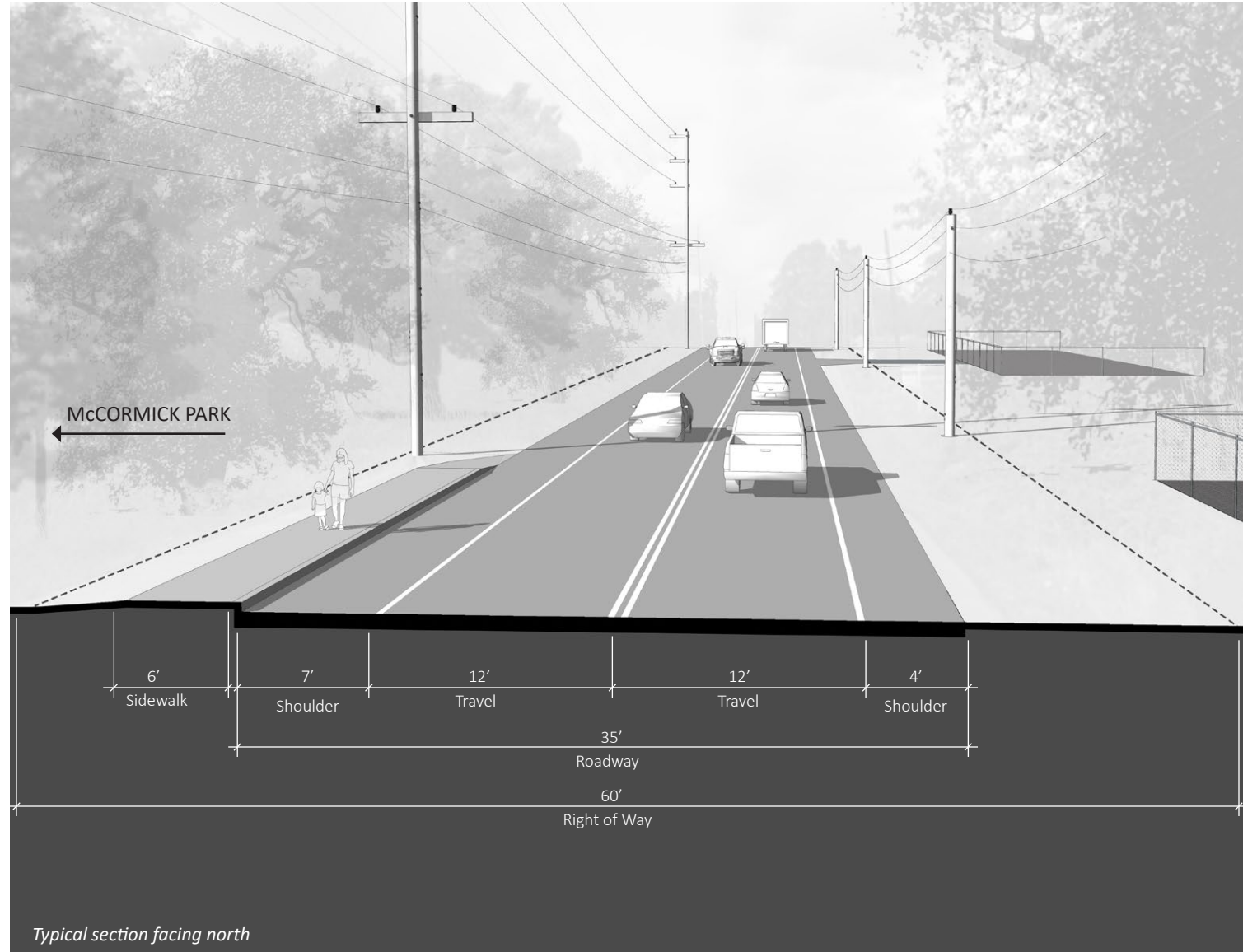
Segment 4.1 project area

## SEGMENT 4.1: OLD PORTLAND ROAD



### Existing Road Section

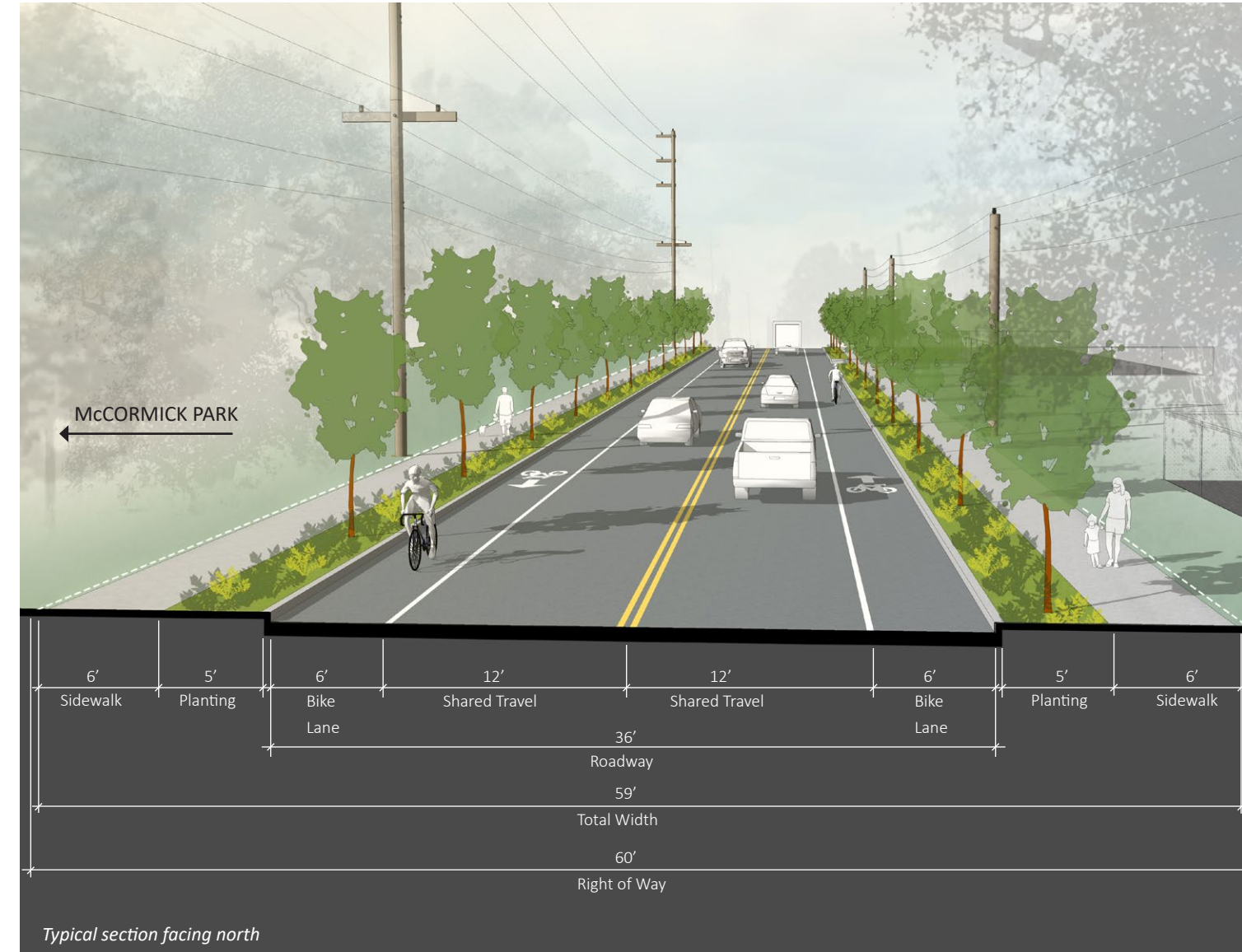
- TSP classification: Minor Arterial
- 60' wide ROW
- Approximately 4,500 linear feet
- Bike lanes on portion of segment
- Sidewalk on portion of segment



### SEGMENT 4.1: OLD PORTLAND ROAD

### Road Section: Option A Standard Minor Arterial

Option A is the standard Minor Arterial section from the St. Helens TSP. Because of the on-street bike lanes, this design targets a speed limit of 35 mph or less west of the Milton Creek Bridge, where it is currently signed at 40 mph (east of the bridge is currently signed at 30 mph).



### SEGMENT 4.1: OLD PORTLAND ROAD



**Road Section: Option B**  
**Multi-Use Path**

Option B replaces the bicycle lanes and one sidewalk with a 12' wide multi-use path for both bicyclists and pedestrians. Transitions from the multi-use path to bike facilities and sidewalks on adjacent road segments (depending on the options selected) will need to be considered.



**SEGMENT 4.1: OLD PORTLAND ROAD**

**Road Section: Option C**  
**Two-Way Cycletrack**

Option C replaces the bicycle lanes with a 12' wide raised two-way cycletrack. Transitions from the cycletrack to bike lanes on adjacent road segments and cycletrack crossings at intersections (depending on the options selected) will need to be considered. This general concept could also be achieved with two one-way cycletracks on either side of the road, or two buffered bicycle lanes, though having a consistent bicycle facility traversing several segments is preferred.

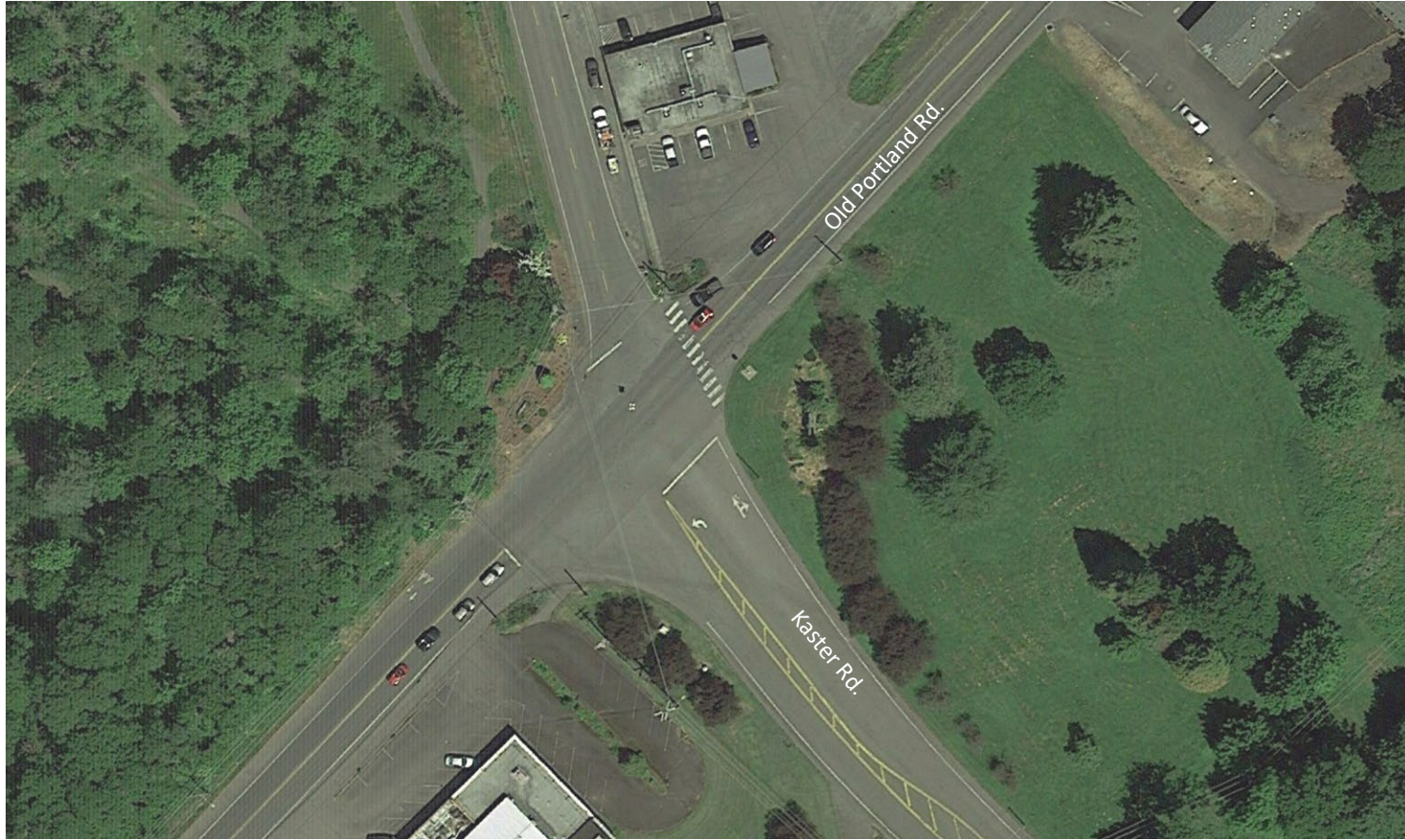


**SEGMENT 4.1: OLD PORTLAND ROAD**



### Intersection Evaluation

The intersection of Old Portland Road and Kaster Road is currently signalized; however, the signal is not consistent with current standards. Therefore, modifications to the intersection would require a full upgrade of the traffic signal as well as reconstruction of the intersection to meet ADA requirements.

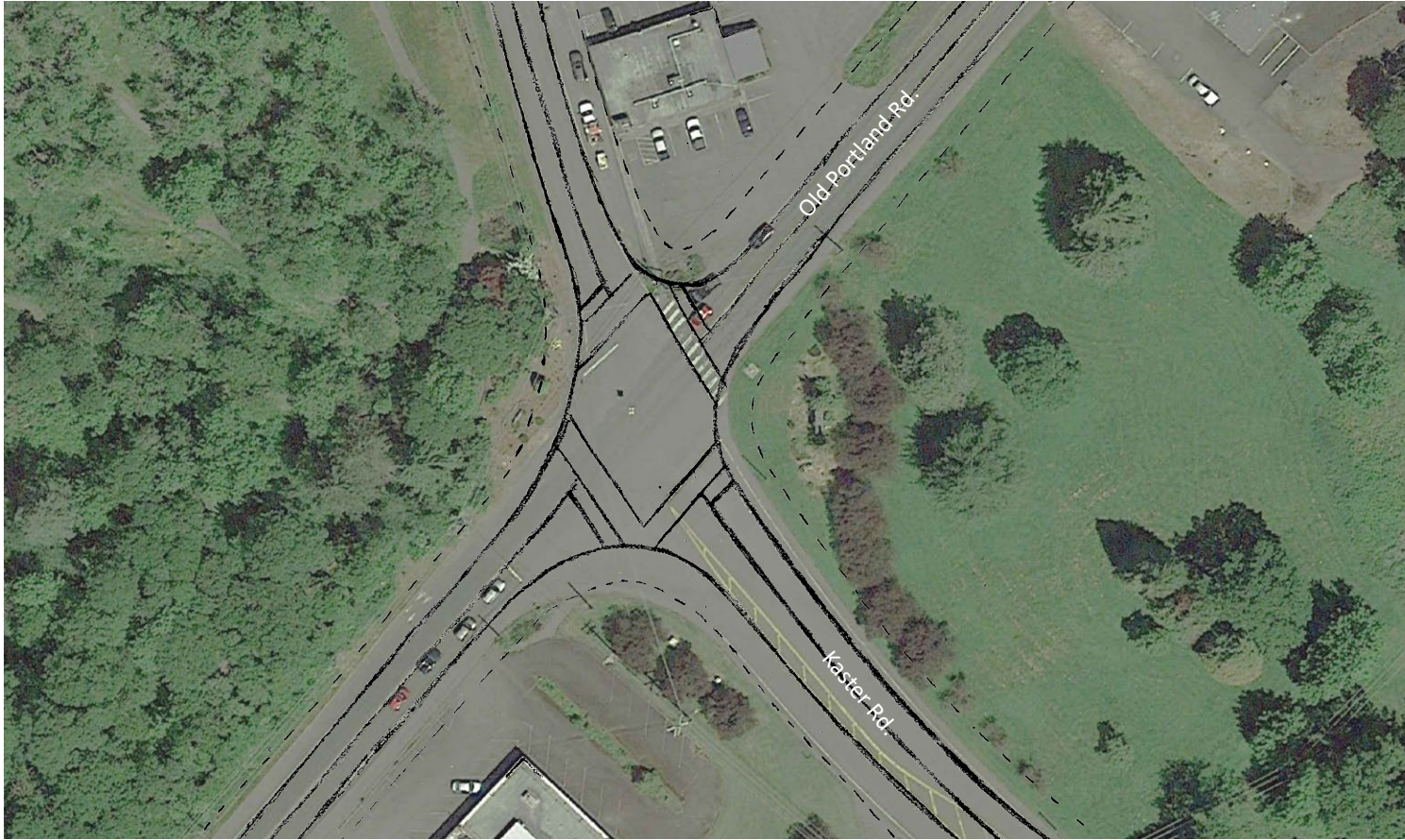


Existing conditions (image: Google Earth)

### INTERSECTION: OLD PORTLAND ROAD & KASTER ROAD

### Option A Upgrade Traffic Signal

- Upgrades the traffic signal to current standards
- Reduces the footprint of the intersection
- Provides signalized pedestrian crosswalks
- Meets traffic signal warrants

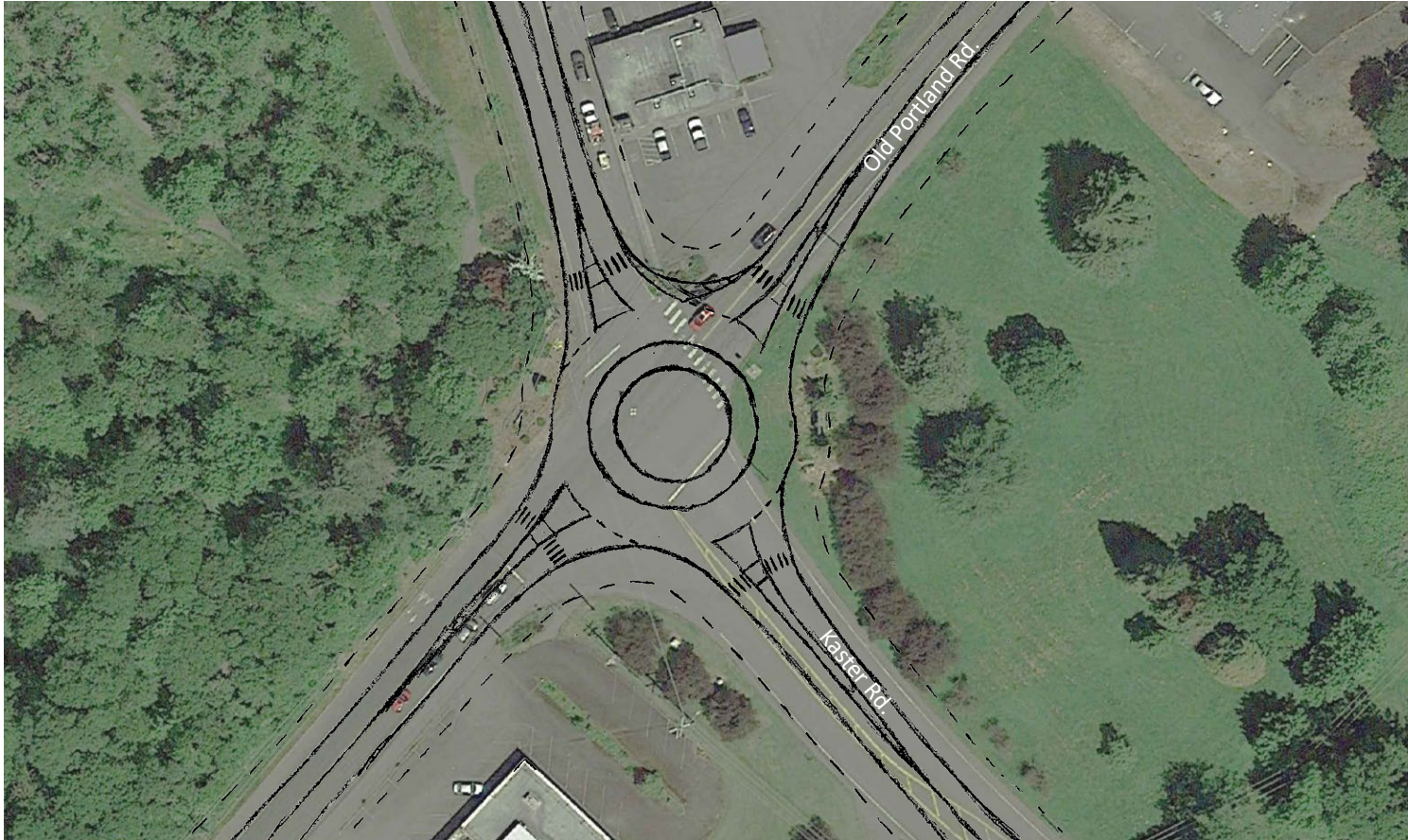


### INTERSECTION: OLD PORTLAND ROAD & KASTER ROAD



**Option B**  
**Four-Leg Roundabout**

- Provides a four-legged roundabout in place of the traffic signal
- The center island of the roundabout could be used for an art feature
- Roundabout provides designated pedestrian crossings
- Roundabout reduces travel speeds relative to a signalized intersection



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**INTERSECTION: OLD PORTLAND ROAD & KASTER ROAD**



## Intersection Evaluation

The intersection of Old Portland Road and Railroad Avenue is located adjacent to an existing spur line railroad track that serves the industrial properties to the south. The intersection is also closely spaced with other intersections along the corridor and has a history of safety and operational issues. The following design options were developed for further consideration.



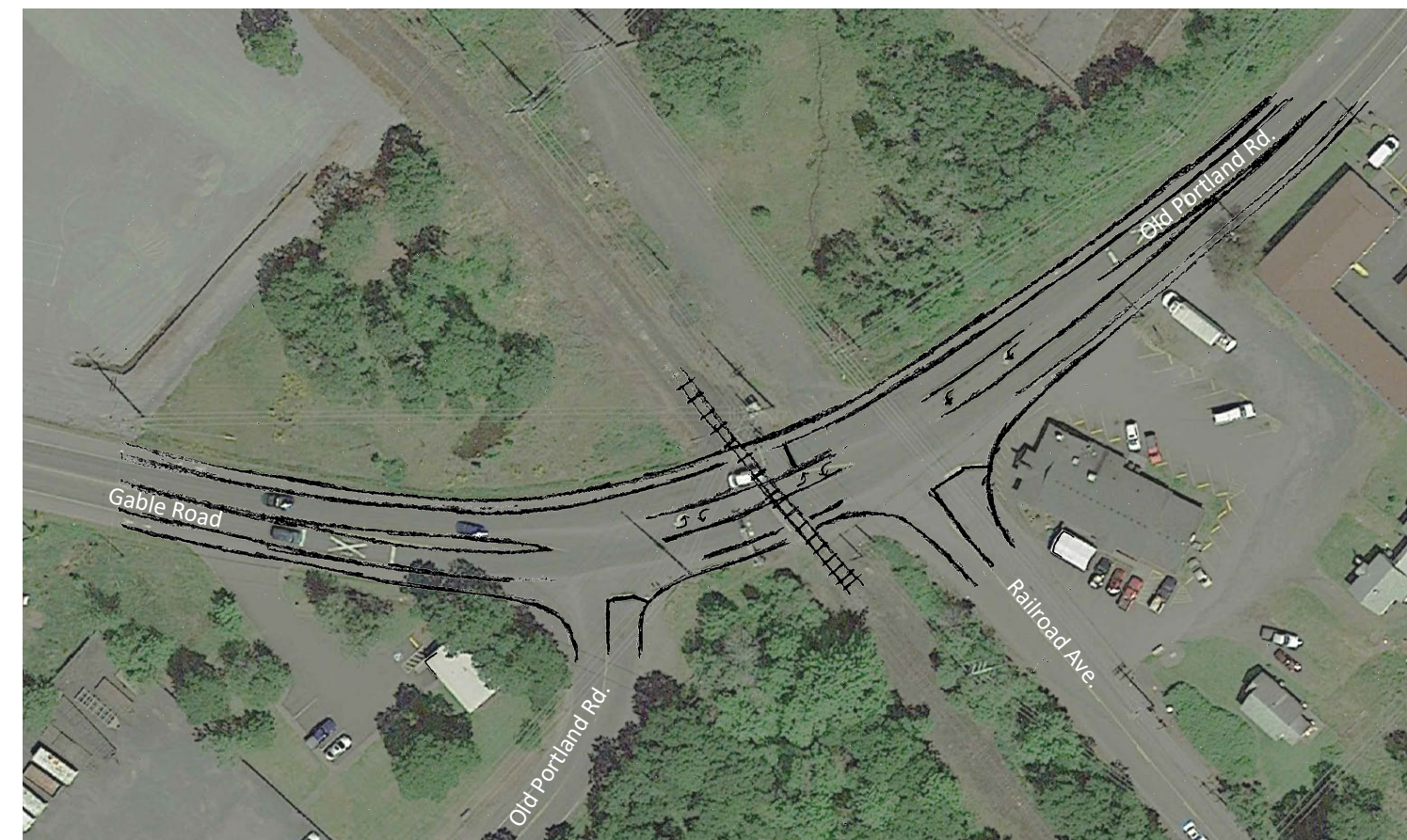
Existing conditions (image: Google Earth)

## INTERSECTION: OLD PORTLAND ROAD & PORT AVENUE

## Option A

### Two-Way Left Turn Lane

- Provides a continuous two-way left-turn lane along Old Portland Road through the Old Portland Road/Railroad Avenue intersection.
- The two-way left-turn lane facilitates the ability for northbound motorists to complete two-stage left-turns from Railroad Avenue to Old Portland Road.
- May not require widening along Old Portland Road due to current roadway width.
- May require reconstruction of adjacent rail crossing to current standards
- ODOT Rail unlikely to permit this option without relocation of Old Portland Road given the potential to trap a vehicle in the left-turn lane

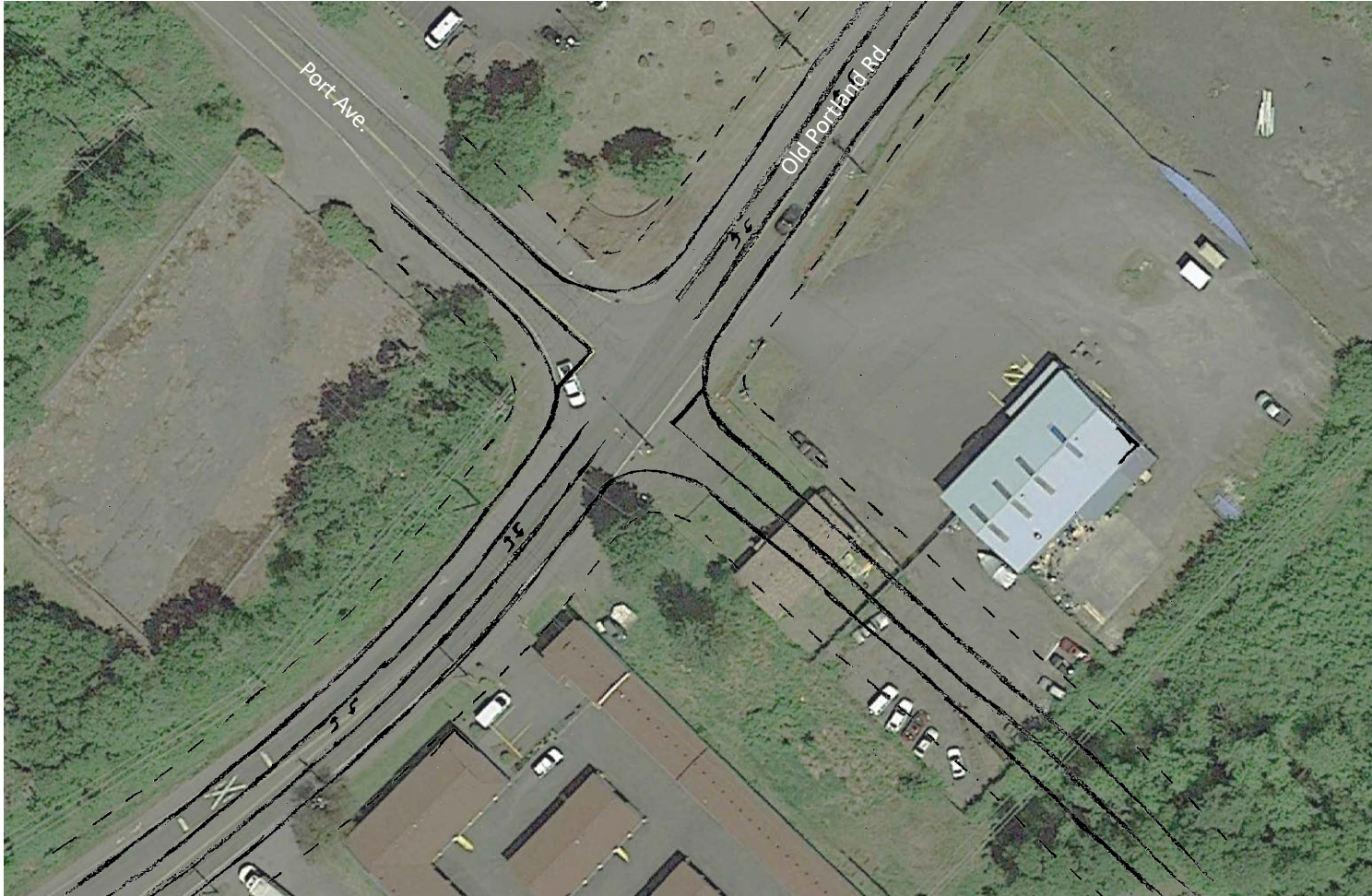


## INTERSECTION: OLD PORTLAND ROAD & PORT AVENUE



**Option B**  
**Re-Align & Two-Way Left-Turn Lane**

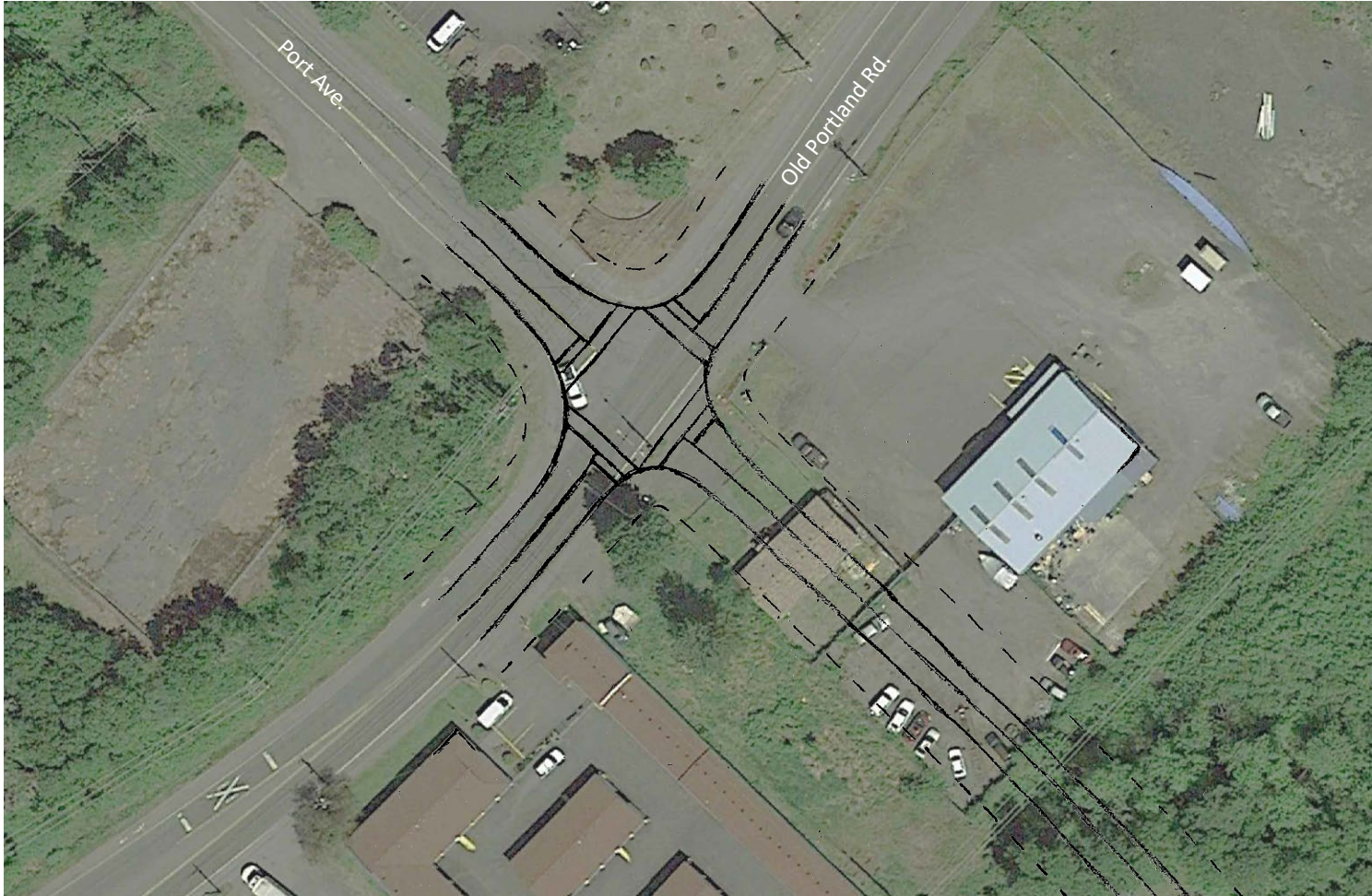
- Re-aligns Railroad Avenue across from Port Avenue.
- Consolidates the Railroad Avenue and Port Avenue intersections into one intersection and relieves current issues with closely-spaced intersections along Old Portland Road.
- Provides a continuous two-way left-turn lane along Old Portland Road through the Old Portland Road/Railroad Avenue-Port Avenue intersection.
- The two-way left-turn lane provides the ability for northbound and southbound motorists to complete two-stage left-turns from Railroad Avenue and Port Avenue to Old Portland Road.
- Will require widening along Old Portland Road due to current roadway width.



**INTERSECTION: OLD PORTLAND ROAD & PORT AVENUE**

**Option C**  
**Re-Align & Traffic Signal**

- Re-aligns Railroad Avenue across from Port Avenue.
- Consolidates the Railroad Avenue and Port Avenue intersections into one intersection and relieves current issues with closely-spaced intersections along Old Portland Road.
- Provides a traffic signal at the new Old Portland Road/Railroad Avenue-Port Avenue intersection.
- Does not require widening along old Portland Road.
- Traffic volumes meet signal warrants under horizon year projections.



**INTERSECTION: OLD PORTLAND ROAD & PORT AVENUE**



## Intersection Evaluation

Several options for improving this intersection were identified and narrowed to the following two options for evaluation.

Both options performed well in the evaluation. Based on further review and discussion with the project management team, Option B is the preferred long-term alternative.

The City should monitor changes in traffic and travel performance after improvements to the US 30/Millard Road intersection are implemented and/or other measures are successful in encourage more drivers to use Old Portland Road to access the Riverfront area.

At the point that increased potential traffic on Old Portland Road warrants investment in additional improvements to this intersection, Option A may be evaluated further.



Existing conditions (image: Google Earth)

## INTERSECTION: OLD PORTLAND ROAD & GABLE ROAD

## Option A

### Re-Align Gable Road with Signal

- Realigns Gable Road to create a 'T' intersection with Old Portland Road.
- Emphasizes Old Portland Road as the through-route.
- The intersection is moved to the southwest to increase the separation from the rail crossing and to reduce the potential for westbound right-turn queues that extend beyond spur line track.
- The intersection is signalized with turn pockets.
- May require traffic signal interconnect to railroad crossing which may trigger the need for rail crossing improvements.



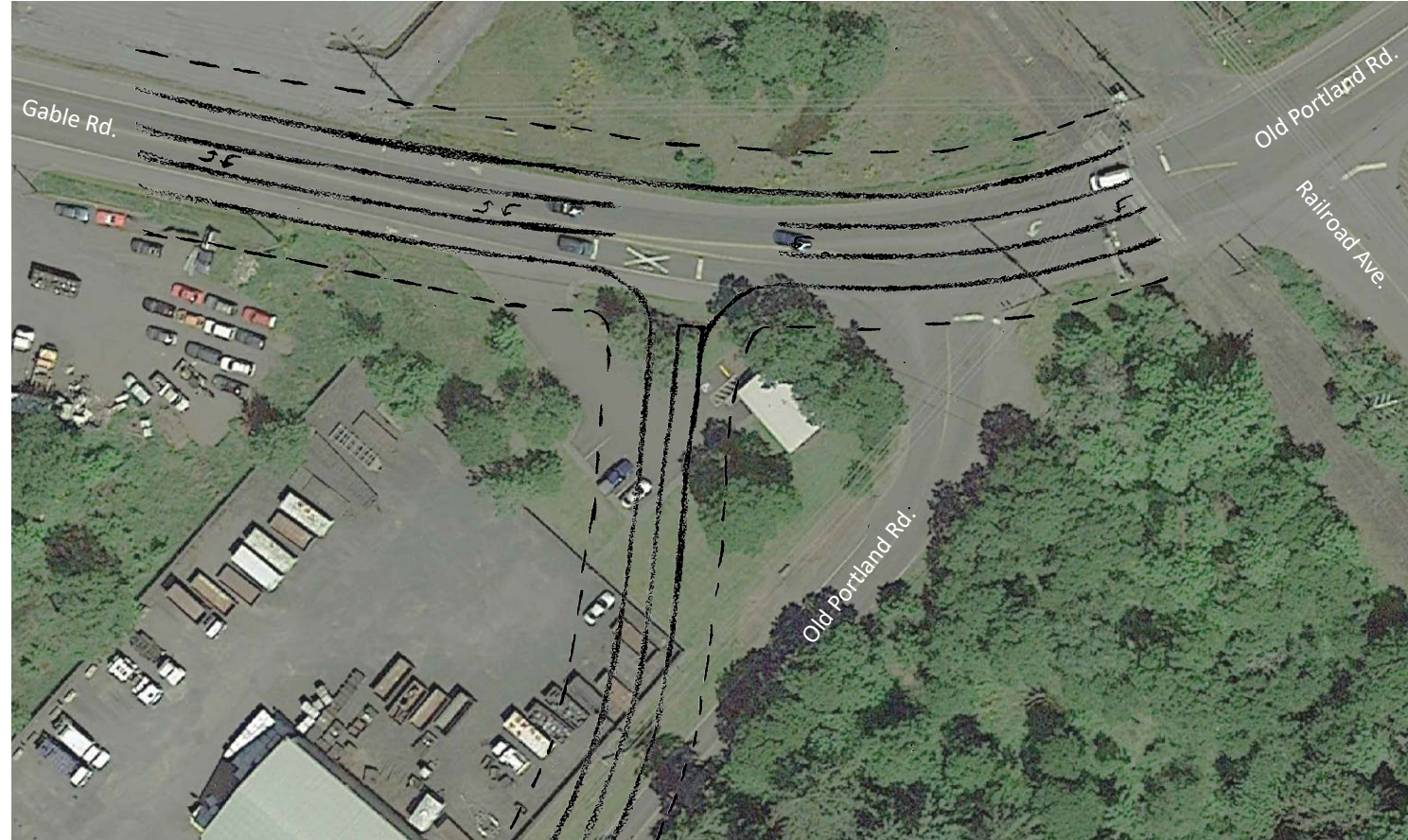
## INTERSECTION: OLD PORTLAND ROAD & GABLE ROAD



## Option B

### Re-Align Old Portland Road

- Realigns Old Portland Road to create a 'T' with Gable Road further to the west.
- Emphasizes Gable Road as the through-route.
- The intersection is moved to the northwest to increase the separation from the rail crossing and to reduce potential for westbound left-turn queues that extend beyond the spur line track.
- The intersection is unsignalized; however, Gable Road is widened to provide a two-way left-turn lane through the intersection.
- The two-way left-turn lane will allow northbound motorists along Old Portland Road to complete two-stage left-turns onto Gable Road.



## INTERSECTION: OLD PORTLAND ROAD & GABLE ROAD

## Evaluation Summary Table

**Rating System:**

Poor      Moderate      Good

○      ◐      ◑      ◒      ●

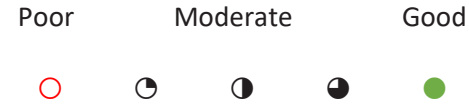
Road Section Options	Economy and Business Support				Transportation Safety and Mobility					Connectivity & Streetscape Aesthetics			
	Consistency with Previous Planning	Supports businesses and business districts	Supports customers, employees, and others by providing access	Relative Cost effectiveness	Improved connectivity & access	Improved pedestrian/bicycle safety and accessibility	Through-movement and mobility	Safety	Emergency Vehicle accommodations	Improved street appearance	Improved ped/bike connectivity	Street designs catered to needs of particular segments	Sustainable Design Strategies
Option A	●	●	◑	◑	◐	◑	◑	◑	◑	◐	◑	◑	◑
Option B	◑	◑	◑	◑	◑	◑	◑	◑	◑	◑	●	●	●
Option C	◑	◑	◑	◑	◑	●	◑	●	◑	◑	●	●	◑

## SEGMENT 4.1: OLD PORTLAND ROAD



### Evaluation Summary Table

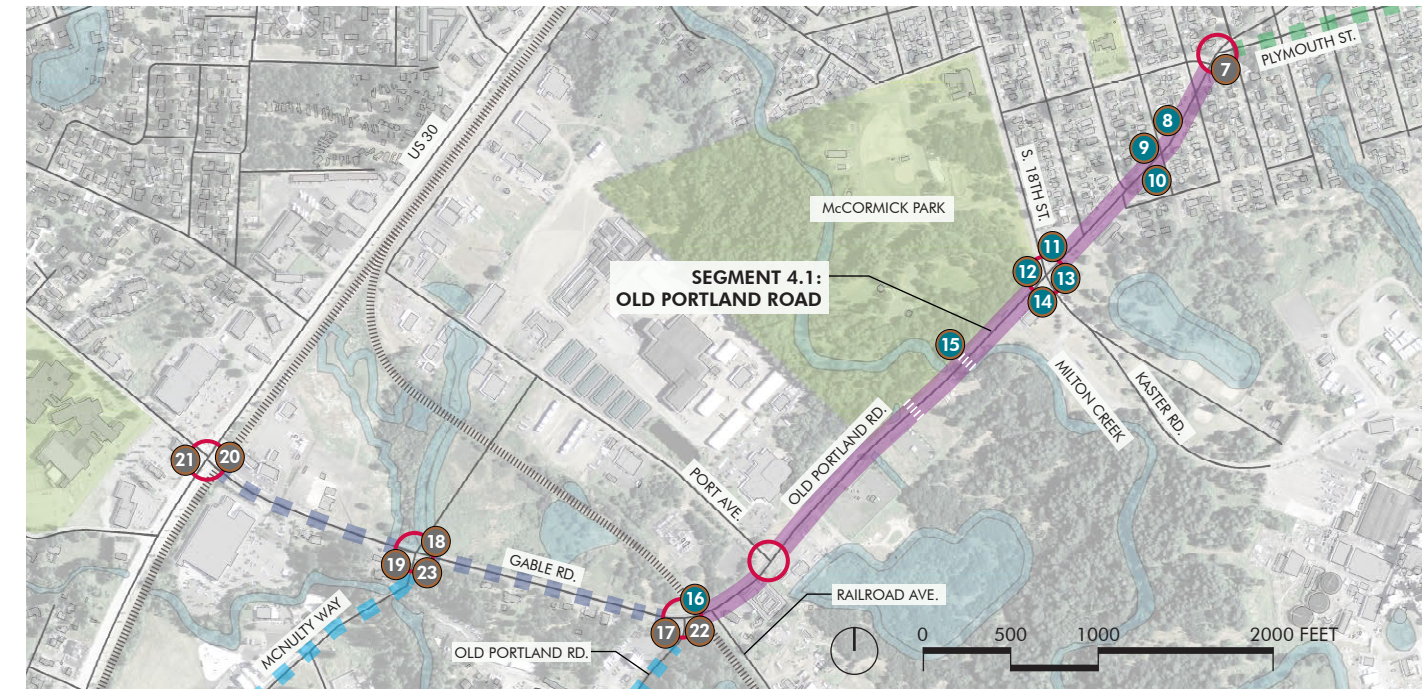
Rating System:



		Economy and Business Support				Transportation Safety and Mobility					Connectivity & Streetscape Aesthetics			
		Consistency with Previous Planning	Supports businesses and business districts	Supports customers, employees, and others by providing access	Relative Cost effectiveness	Improved connectivity & access	Improved pedestrian/bicycle safety and accessibility	Through-movement and mobility	Safety	Emergency Vehicle accommodations	Improved street appearance	Improved ped/bike connectivity	Street designs catered to needs of particular segments	Sustainable Design Strategies
Old Portland Road/ Kaster Road	Option A	●	●	●	●	●	●	●	●	●	●	●	●	○
	Option B	●	●	●	●	●	●	●	●	●	●	●	●	●
Old Portland Road/Port Avenue	Option A	●	●	●	●	○	○	●	○	●	●	●	●	○
	Option B	●	●	●	●	○	●	●	●	●	●	●	●	●
	Option C	●	●	●	●	○	●	●	●	●	●	●	●	○
Old Portland Road/ Gable Road	Option A	●	●	●	●	●	●	●	●	●	●	●	●	○
	Option B	●	●	●	●	●	●	●	●	●	●	●	●	●

### SEGMENT 4.1: OLD PORTLAND ROAD

### Wayfinding Recommendations



**LEGEND**  
 3 Wayfinding Sign for Segment 4.1  
 6 Wayfinding Sign for other segments  
 ○ Key Intersection

Wayfinding locations for Segment 4.1

Wayfinding Recommendations: Segment 4.1					
(See Appendix 2 for full table including destinations)					
ID #	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing
8	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 15th Street	North
9	Bicycle/Pedestrian	On-Street Directional	South 15th Street	Old Portland Road	North
10	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 15th Street	West
11	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 18th Street/Kaster Road	East
12	Bicycle/Pedestrian	On-Street Directional	South 18th Street	Old Portland Road	North
13	Bicycle/Pedestrian	On-Street Directional	Kaster Road	Old Portland Road	South
14	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 18th Street/Kaster Road	West
15	Bicycle/Pedestrian	Trailhead Kiosk	Old Portland Road	N/A	South
16	Bicycle	On-Street Confirmation	Old Portland Road	Gable Road	East

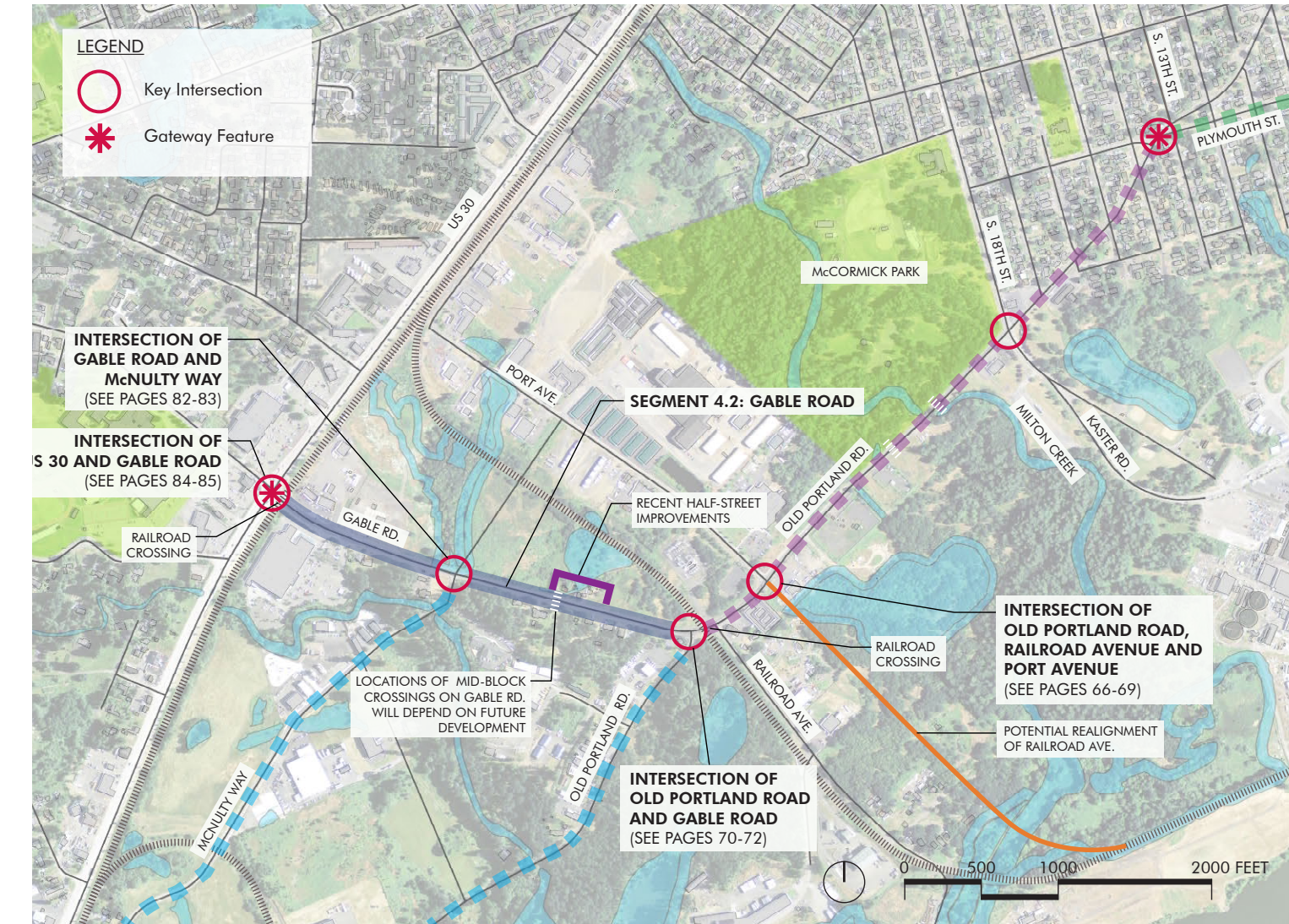
### SEGMENT 4.1: OLD PORTLAND ROAD



# SEGMENT 4.2 EVALUATION

This segment provides connections from Highway 30 to Old Portland Road. It is a major access point for commercial land uses near the highway and entryway to the City of St. Helens.

Similar to Segment 4.1, the lack of adequate pedestrian facilities (except near US 30), bicycle lanes without buffers or other separation from vehicle traffic, and higher travel speeds on the eastern portion of this segment all necessitate improved pedestrian and bicycle facilities.



Segment 4.2 project area

## SEGMENT 4.2: GABLE ROAD



## Existing Road Section

TSP classification: Minor Arterial

80' wide ROW

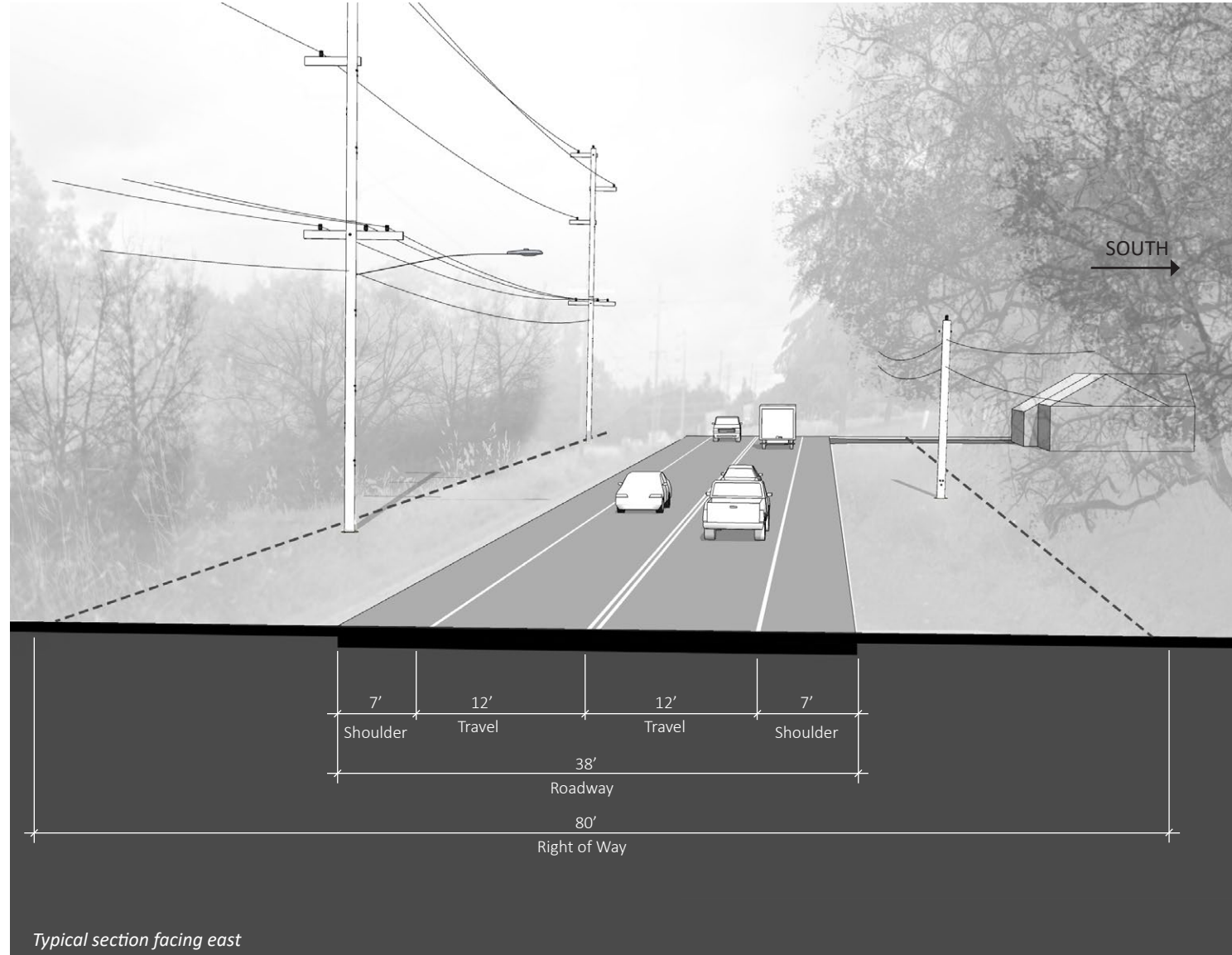
Approximately 2,900 linear feet

Bike lanes on both sides

Sidewalks only near US 30

Similar to Old Portland Road, the current roadway has two travel lanes and bicycle lanes on both sides, along with drainage ditches on either side of the roadway, and has a 40 mph speed limit, except in the vicinity of US 30 where the speed limit is 30 mph.

Much of this segment is characterized by industrial land uses, along with an area of concentrated retail near the intersection with US 30 and smaller collection of commercial and other uses near the intersection of Gable and Old Portland Roads.



## SEGMENT 4.2: GABLE ROAD

## Road Section: Option A Standard Minor Arterial with Median

This section is similar to Option A in Segment 4.1, with the addition of a 14' wide planted median.

Because of the on-street bike lanes, this design targets a speed limit of 35 mph or less. Currently Gable Road is signed at 40 mph.

The planted median provides a location for turn pockets, a 2-way left turn lane, and for a pedestrian refuge at mid-block crossings, as needed.

Implementation of the median and turn pockets would require anticipation of the location of future development along the road. In addition, local emergency service providers may have issues related to their ability to pass motorists if needed in the event of an emergency.



## SEGMENT 4.2: GABLE ROAD



### Road Section: Option B Multi-Use Path with Median

This section is similar to Option B in Segment 4.1, with the addition of a 14' wide planted median.

Option B replaces the bicycle lanes and one sidewalk with a 12' wide multi-use path for both bicyclists and pedestrians. Transitions from the multi-use path to bike lanes and sidewalks on adjacent road segments will need to be considered.

The planted median provides a location for turn pockets, a 2-way left turn lane, and for a pedestrian refuge at mid-block crossings, as needed.

Implementation of the median and turn pockets would require anticipation of the location of future development along the road. In addition, local emergency service providers may have issues related to their ability to pass motorists if needed in the event of an emergency.



## SEGMENT 4.2: GABLE ROAD

### Road Section: Option C Two-Way Cycletrack with Median

This section is similar to Option C in Segment 4.1, with the addition of a 14' wide planted median.

Option C replaces the bicycle lanes with a 12' wide raised two-way cycletrack. Transitions from the cycletrack to bike facilities on adjacent road segments and cycletrack crossings at intersections need to be considered. This general concept could also be achieved with two one-way cycletracks or two buffered bicycle lanes.

The planted median provides a location for turn pockets, a 2-way left turn lane, and for a pedestrian refuge at mid-block crossings, as needed.

Implementation of the median and turn pockets would require anticipation of the location of future development along the road. In addition, local emergency service providers may have issues related to their ability to pass motorists if needed in the event of an emergency.



## SEGMENT 4.2: GABLE ROAD



### Intersection Evaluation

The intersection of McNulty Way and Gable Road currently provides single-lane approaches with shared turn movements for all legs of the intersection. McNulty Way is stop-controlled. Few gaps are available for left-turning vehicles on both McNulty Way and Gable Road.

The St. Helens TSP shows a future extension of McNulty Way to Port Avenue, creating a 4-legged intersection in the future. A traffic signal is not expected to be warranted within the planning horizon.



Existing conditions (image: Google Earth)

### INTERSECTION: GABLE ROAD & MCNULTY WAY

### Potential Intersection

The addition of a westbound left-turn lane provides separation of stopped left-turning vehicles waiting for a gap and westbound through vehicles. The two-way left-turn lane to the west will allow northbound motorists along McNulty Way to complete two-stage left-turns onto Gable Road.

Though the proposed intersection provides acceptable operations for the horizon year, separate left- and right-turn lanes could be provided on McNulty Way beyond the horizon year and/or when a connection to Port Avenue is made.



### INTERSECTION: GABLE ROAD & MCNULTY WAY



### Intersection Evaluation

The intersection of US 30 and Gable Road currently serves as an entrance to the east and west areas of the City. It is located along a statewide highway, adjacent to several major retail/commercial centers, and within close proximity to St Helens High School. It is also located adjacent to a heavy rail line, which makes modification of the intersection challenging and very expensive.

The safety and operational issues at the intersection are well documented; however, there are few options to improve overall conditions and to bring the intersection to standard. Consistent with the City's Transportation System Plan, the proposed intersection design includes the addition of a separate right-turn lane at the westbound approach.

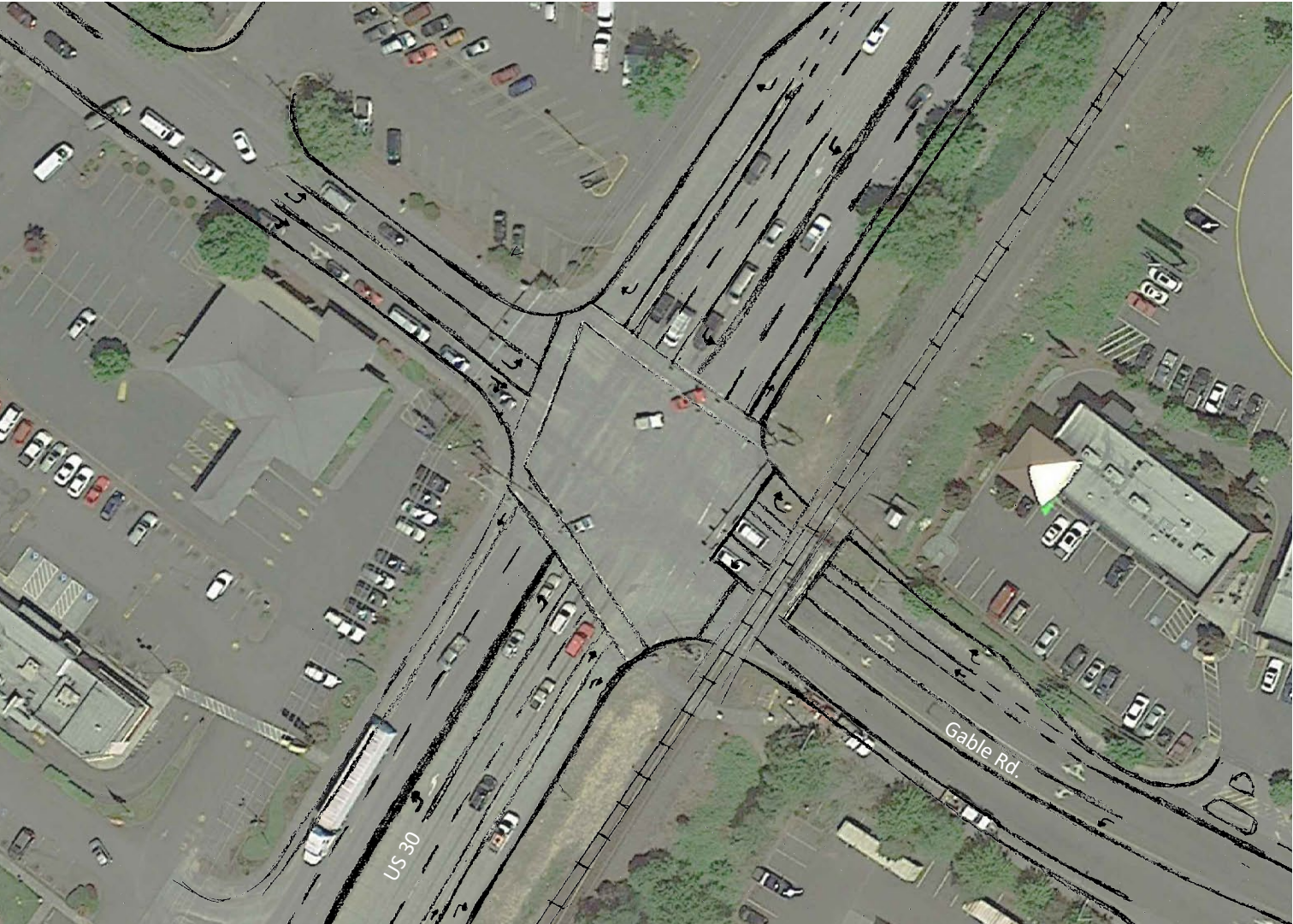


Existing conditions (image: Google Earth)

### INTERSECTION: GABLE ROAD & US 30

### Potential Intersection

The proposed intersection design is expected to improve conditions but is not expected to fully address the operational issues. Therefore, an alternative mobility standard that evaluates the intersection over the course of an hour (or two hours as opposed to the peak 15-minutes) is also being considered. The standard could remain at  $v/c = 0.85$  or could increase to  $v/c = 1.0$  to allow for higher levels of congestion.

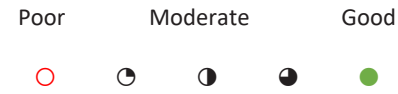


### INTERSECTION: GABLE ROAD & US 30



### Evaluation Summary Table

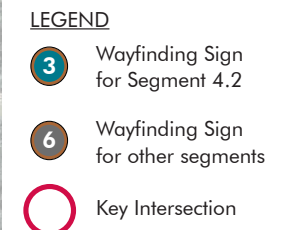
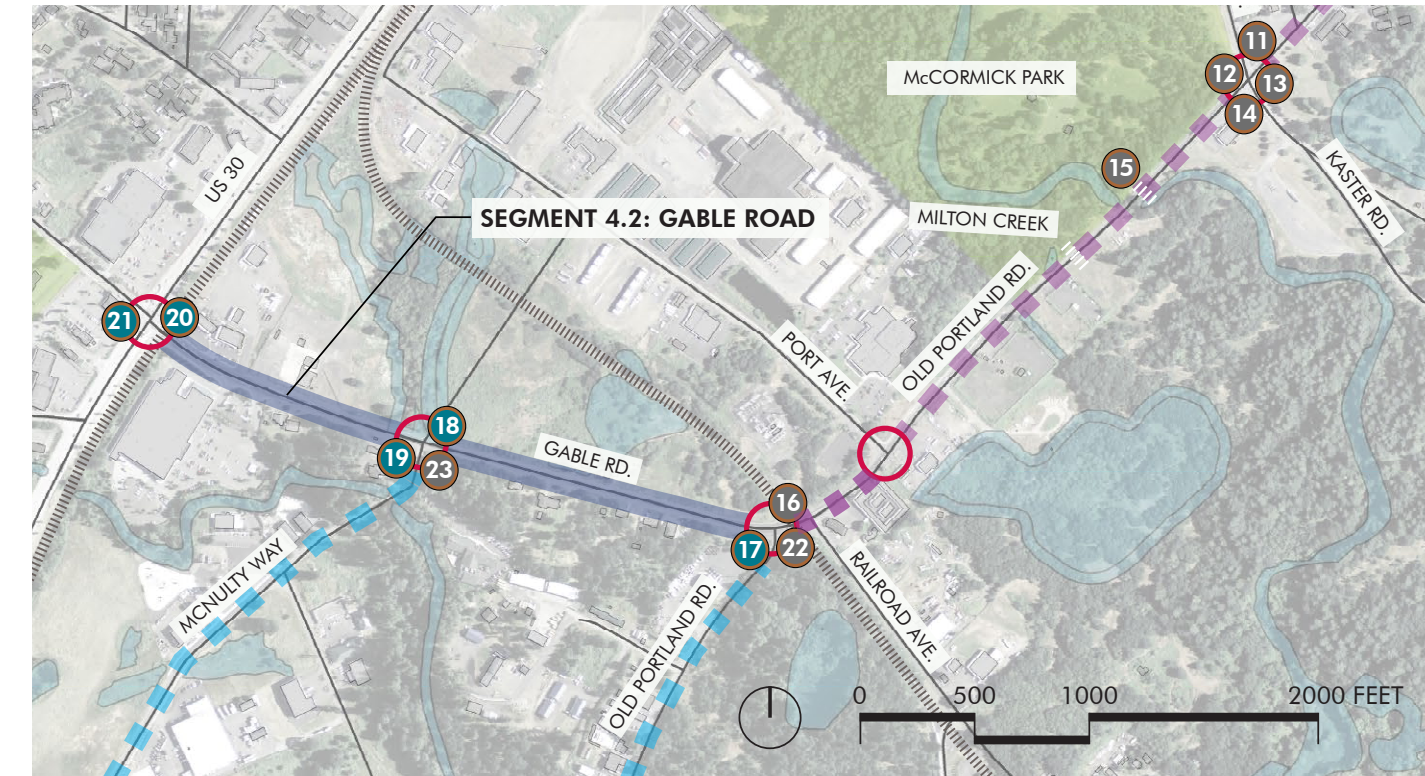
Rating System:



Road Section	Options	Economy and Business Support				Transportation Safety and Mobility					Connectivity & Streetscape Aesthetics			
		Consistency with Previous Planning	Supports businesses and business districts	Supports customers, employees, and others by providing access	Relative Cost effectiveness	Improved connectivity & access	Improved pedestrian/bicycle safety and accessibility	Through-movement and mobility	Safety	Emergency Vehicle accommodations	Improved street appearance	Improved ped/bike connectivity	Street designs catered to needs of particular segments	Sustainable Design Strategies
Road Section Options	Option A	●	●	●	●	●	●	●	●	●	●	●	●	●
	Option B	●	●	●	●	●	●	●	●	●	●	●	●	●
	Option C	●	●	●	●	●	●	●	●	●	●	●	●	●
Gable Road/McNulty Way	Proposed Intersection	●	●	●	●	●	●	●	●	●	●	●	●	○
Gable Road/US 30	Proposed Intersection	●	●	●	●	●	●	●	●	●	●	●	●	○

### SEGMENT 4.2: GABLE ROAD

### Wayfinding Recommendations



Wayfinding locations for Segment 4.2

Wayfinding Recommendations: Segment 4.2					
(See Appendix 2 for full table including destinations)					
ID #	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing
17	Bicycle	On-Street Confirmation	Gable Road	Old Portland Road	West
18	Bicycle/Pedestrian	On-Street Directional	Gable Road	McNulty Way/Milton Way	East
19	Bicycle/Pedestrian	On-Street Directional	Gable Road	McNulty Way/Milton Way	West
20	Bicycle/Pedestrian	On-Street Directional	Gable Road	Highway 30	East
21	Bicycle/Pedestrian	On-Street Directional	Gable Road	Highway 30	West

### SEGMENT 4.2: GABLE ROAD



# SEGMENT 5 EVALUATION

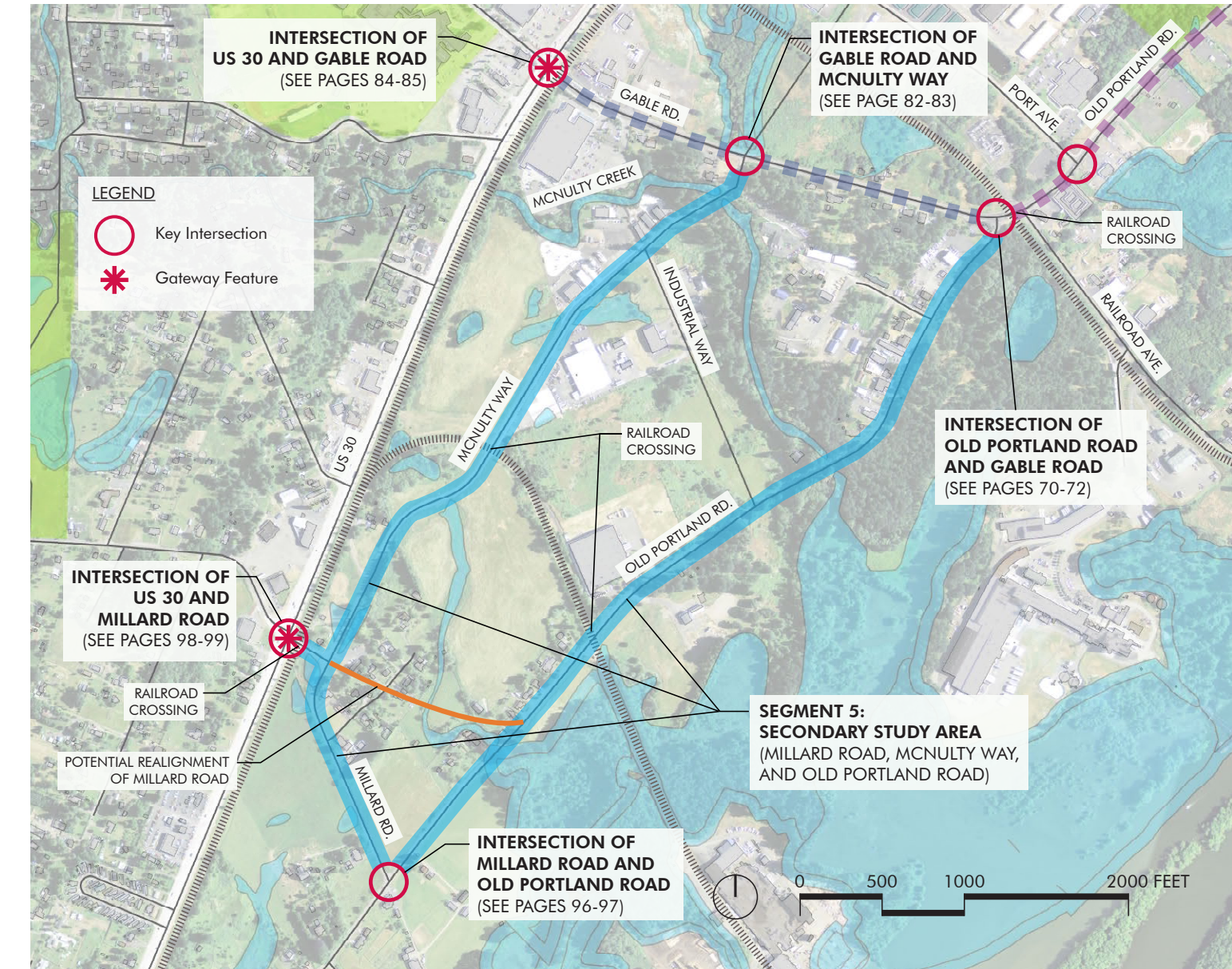
Segment 5 is a secondary area of this analysis; alternatives for this portion of the study area have not been evaluated. It is a possible secondary route to the Riverfront District from US 30, either along McNulty Way or Millard/Old Portland Road. Use of this route would relieve congestion at the US 30/ Gable Road intersection.

The three sections of road in this corridor segment each consist of two travel lanes. There are two railroad crossings: one on McNulty Way, and the other on Old Portland Road. McNulty Way has dedicated bike lanes, which are accessible along a majority of the street. It is also the most developed street and portions of it include curb-tight sidewalks or concrete curbs.

Stormwater runoff on McNulty Way is captured by catch basins located along both sides of the street where there are curbs and then conveyed into a storm drainage system. On the rest of McNulty Way, and all of Millard Road and Old Portland Road, stormwater is captured in ditches, some of which is conveyed to stormwater ponds.

On the northern end of McNulty Way and Old Portland Road adjacent development is a mix of single-story commercial and light industrial buildings. At the southern end of McNulty Way and Old Portland Road, and along Millard Road, residential homes of various sizes and characteristics populate the area.

## SEGMENT 5: SECONDARY STUDY AREA



Segment 5 project area



### Existing Road Conditions

- TSP classification: Minor Arterial
- Approximately 60' wide ROW, minimum 52'
- Approximately 5,600 Linear Feet
- No bike lanes
- No sidewalks



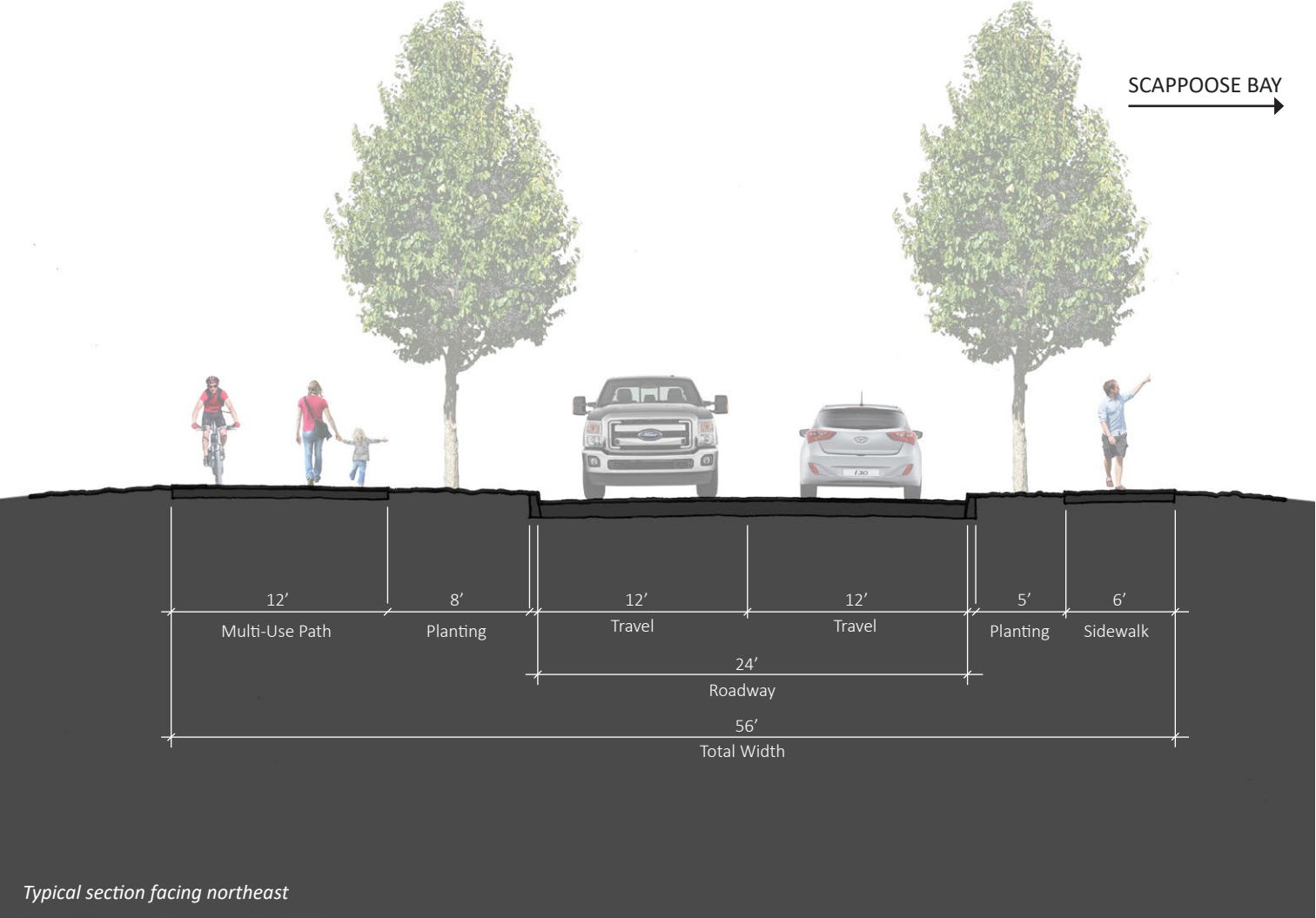
(Image: Google Streetview)

### SEGMENT 5: OLD PORTLAND ROAD

### Potential Road Section

The TSP identifies a shared-use path on the south side of Old Portland Road, (classified as a Minor Arterial) through this area. However, for this study, the shared use path is proposed to be realigned to the north side, depending on which cross-section is recommended for Segment 4.1.

This proposed section is the same as Option B for Old Portland Road in Segment 4.1.



Typical section facing northeast

### SEGMENT 5: OLD PORTLAND ROAD



### Existing Road Conditions

- TSP classification: Collector Street
- 60' to 90' wide ROW
- Approximately 4,100 Linear Feet
- Bike lanes are incomplete
- Sidewalks are incomplete

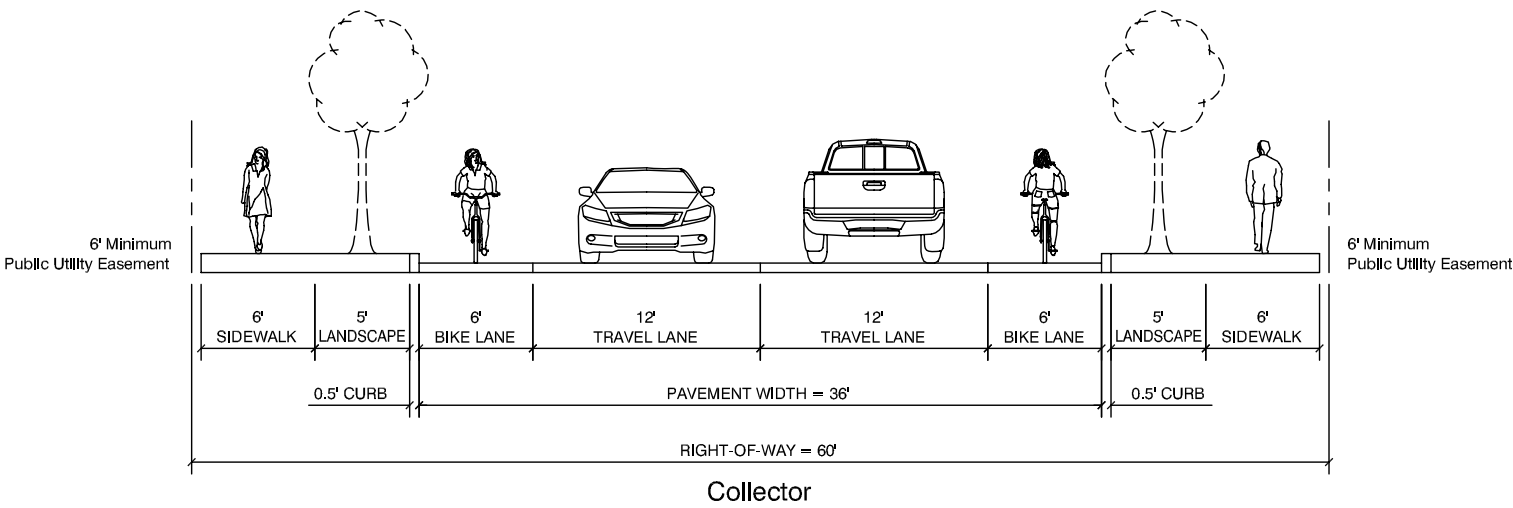


(Image: Google Streetview)

### SEGMENT 5: MCNULTY WAY

### Potential Road Section

McNulty Way is classified as a Collector street and the standard TSP cross-section is recommended.



Typical section

### SEGMENT 5: MCNULTY WAY



### Existing Road Conditions

- TSP classification: Minor Arterial
- 40' wide ROW, wider at US. 30
- Approximately 1,700 Linear feet
- No bike lanes
- No sidewalks

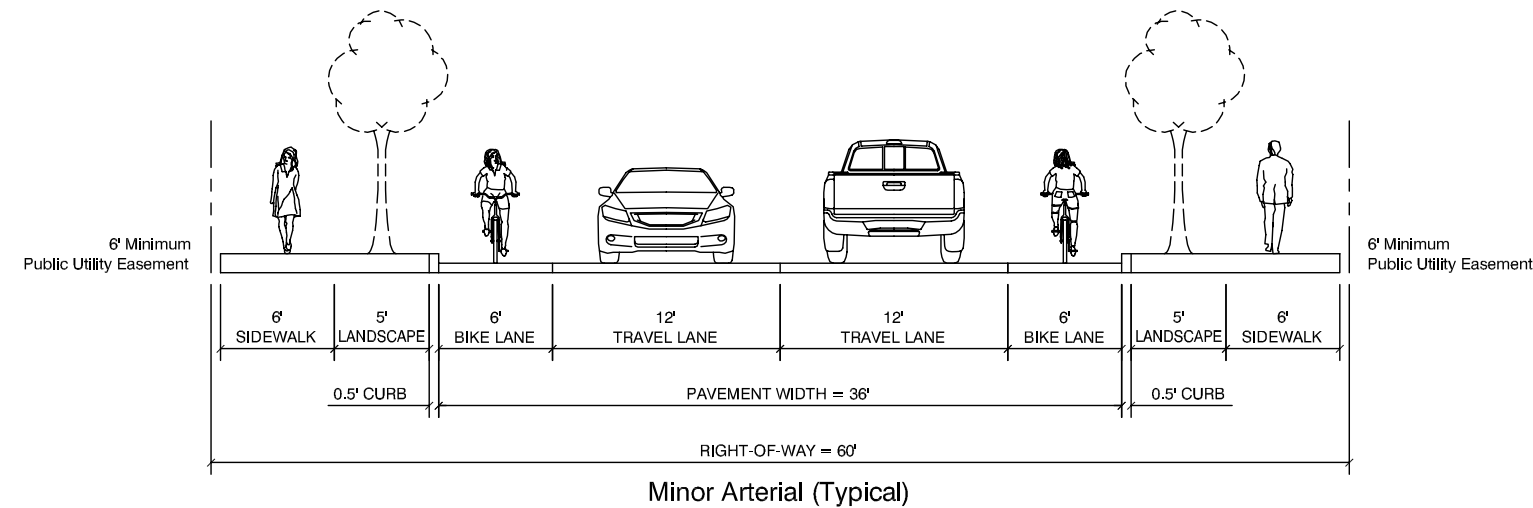


(Image: Google Streetview)

### SEGMENT 5: MILLARD ROAD

### Potential Road Section

Millard Road is classified as a Minor Arterial and the standard TSP cross-section is recommended.



Typical section

### SEGMENT 5: MILLARD ROAD



## Intersection Evaluation

The intersection of Old Portland Road and Millard Road currently provides single-lane approaches with share turn movements for all legs of the intersection. Millard Road is stop-controlled. The existing intersection's skewed angle makes truck turns difficult for the westbound right-turn movement.



Existing conditions (image: Google Earth)

## INTERSECTION: MILLARD ROAD & OLD PORTLAND ROAD

## Potential Intersection

The intersection of Old Portland Road and Millard Road is being considered for a re-alignment to improve sight conditions and safety. A broader re-alignment of the roadway which brings Millard to the east was identified in the TSP and is also under consideration.

Additional pavement in the northwest corner of the intersection will help accommodate large truck turning movements from Old Portland Road to Millard Road.

Wayfinding signage at both Old Portland Road and McNulty Way (from Millard and US 30) would direct people towards Gable Road, the Riverfront and the Downtown area to the north.



## INTERSECTION: MILLARD ROAD & OLD PORTLAND ROAD



### Intersection Evaluation

The intersection of US 30 and Millard Road is currently side-street stop-controlled. Two through lanes, left-, and right-turn lanes are provided along US 30 and shared left-and-through lanes and right-turn lanes are provided on Millard Road. A railroad crossing is present on the east leg.



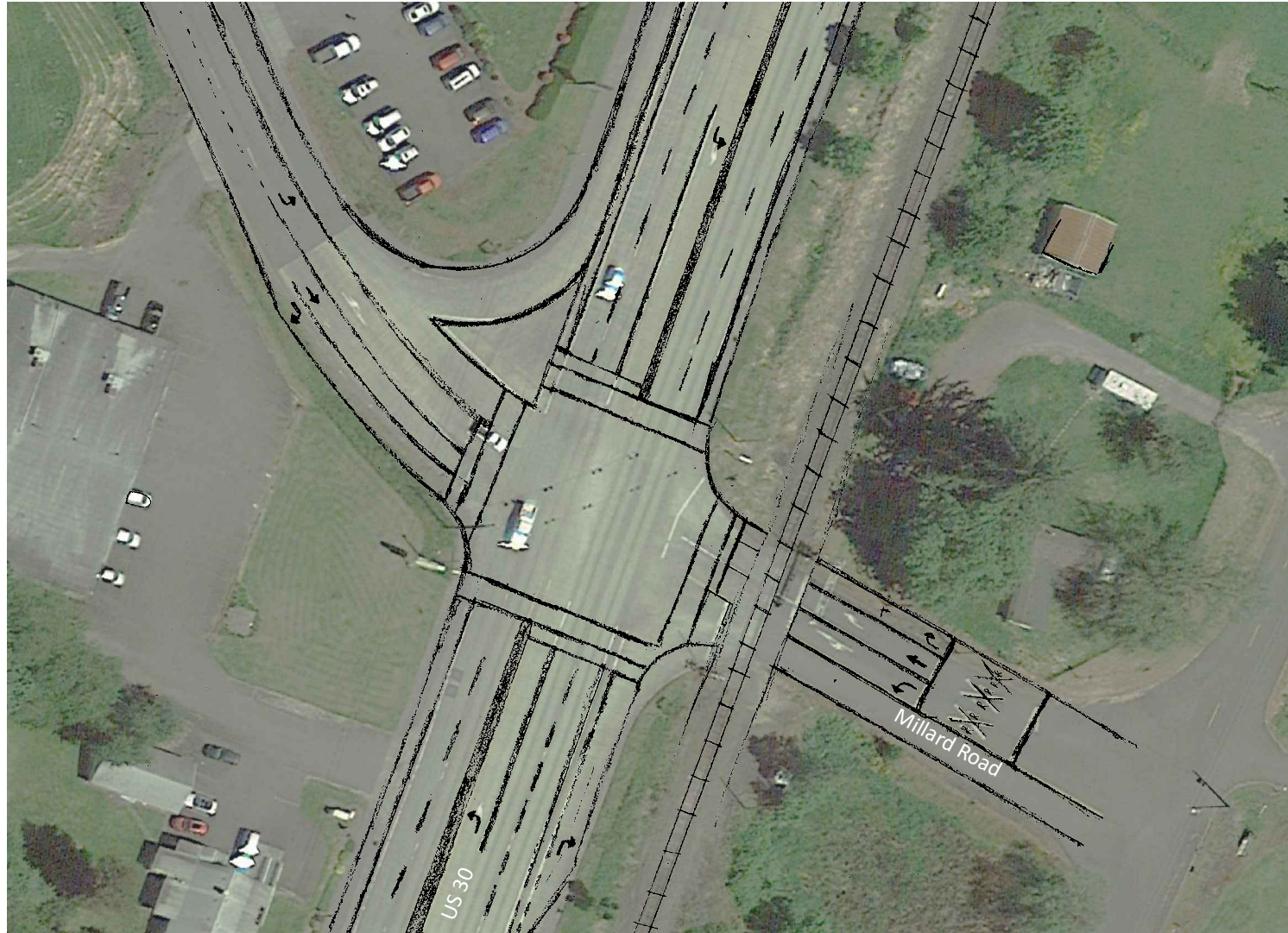
Existing conditions (image: Google Maps)

### INTERSECTION: MILLARD ROAD & US 30

### Potential Intersection

The Oregon Department of Transportation (ODOT) is currently planning to install a traffic signal at the intersection of US 30 and Millard Road. The traffic signal will improve existing traffic operations and safety at the intersection as well as at the intersection of US 30 and Gable Road.

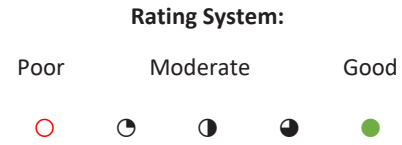
Some traffic from the intersection of US 30 and Gable Road is expected to re-distribute to Millard Road via Old Portland Road and McNulty Way. However, based on an evaluation of ODOT's current plans, the intersection is expected to experience capacity limitations in the long-term future; therefore, the proposed intersection design includes separate left, through, and right-turn lanes at the eastbound and westbound approaches.



### INTERSECTION: MILLARD ROAD & US 30

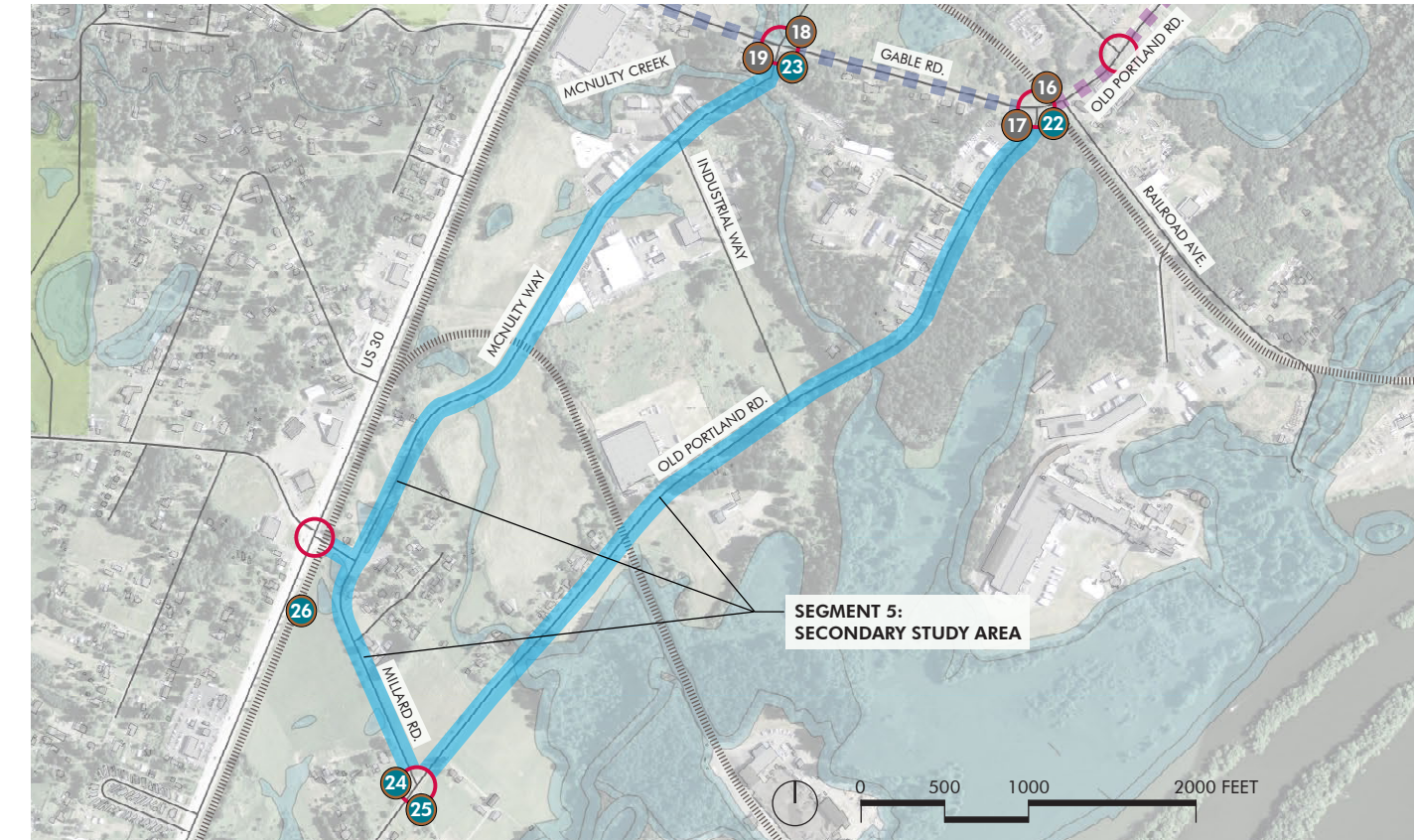


### Evaluation Summary Table



Proposed Road Section	Road Name	Economy and Business Support				Transportation Safety and Mobility				Connectivity & Streetscape Aesthetics			
		Consistency with Previous Planning	Supports businesses and business districts	Supports customers, employees, and others by providing access	Relative Cost effectiveness	Improved connectivity & access	Improved pedestrian/bicycle safety and accessibility	Through-movement and mobility	Safety	Emergency Vehicle accommodations	Improved street appearance	Improved ped/bike connectivity	Street designs catered to needs of particular segments
Proposed Road Section	Old Portland Road	●	●	●	◑	◑	◑	◑	◑	◑	◑	◑	◑
	Millard Road	●	●	●	◑	◑	◑	◑	◑	◑	◑	●	◑
	McNulty Way	●	●	●	◑	◑	◑	◑	◑	◑	◑	●	◑
Old Portland / Millard Road	Proposed Intersection	◑	●	●	◑	●	◑	●	●	●	◑	●	○
US 30/ Millard Road	Proposed Intersection	◑	●	●	◑	◑	◑	●	●	●	◑	●	○

### Wayfinding Recommendations



- LEGEND**
- 3 Wayfinding Sign for Segment 5
  - 6 Wayfinding Sign for other segments
  - Key Intersection

Wayfinding locations for Segment 5

Wayfinding Recommendations: Segment 5						(See Appendix 2 for full table including destinations)
ID #	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing	
22	Vehicle	Vehicular Directional	Old Portland Road	Gable Road/Old Portland Road	South	
23	Vehicle	Vehicular Directional	McNulty Way	Gable Road	South	
24	Vehicle	Vehicular Directional	Millard Road	Old Portland Road	North	
25	Vehicle	Vehicular Directional	Old Portland Road	Millard Road	South	
26	Vehicle	Vehicular Directional	Highway 30	Millard Road	South	

### SEGMENT 5: SECONDARY STUDY AREA

### SEGMENT 5: SECONDARY STUDY AREA



## RECOMMENDED DESIGN OPTIONS

The evaluation described in the preceding section of this report has led to the following initial recommendations for preferred roadway and intersection design along the study area corridor. In some cases, more than one option performed well in our evaluation, and further discussion with the City, agency partners, and the broader community likely will be required to identify a recommended design option.

## Recommended Street Section

The proposed section for South 1<sup>st</sup> Street is similar to the existing street and includes sidewalks on both sides of the street, parallel parking on the east side, angled parking on the west side, and two travel lanes. Landscape planters are also proposed on both sides of the street with access across for pedestrians.

Painted sharrows will indicate that bicyclists share the roadway with vehicles on both sides of the street.

Sidewalk bulb-outs will provide a traffic calming effect, and shorten crossing distances for pedestrians. The bulb-outs will not reduce on-street parking, because those areas are already marked to prohibit parking in order to increase visibility for pedestrians and turning vehicles.

Depending on the final streetscape design, the number of on-street parking stalls should be the same or very close to the number of existing stalls.

As noted previously, this segment currently includes angled parking. The City may investigate use of reverse angled parking in this area in the future.



## SEGMENT 1: SOUTH 1<sup>ST</sup> STREET



## Recommended Street Section

Only one roadway cross-section was proposed. The proposed design ultimately may be refined as part of future redevelopment processes, depending on available right-of-way. If less than 80 feet of right-of-way is available, some elements of the design may be narrowed or eliminated as shown in the table below.

Element	Width
Travel lanes	10-12'
Bike lanes	0-6'
Parallel parking	8'
Planting strips	4-6'
Sidewalks	8'
Total	60-80'

A traffic calming circle could serve as a gateway feature and a way for drivers to turn around in this area. The design of the traffic circle will depend on whether or not it includes a gateway feature and whether it will need to accommodate large trucks.

No key intersections were evaluated in this segment.

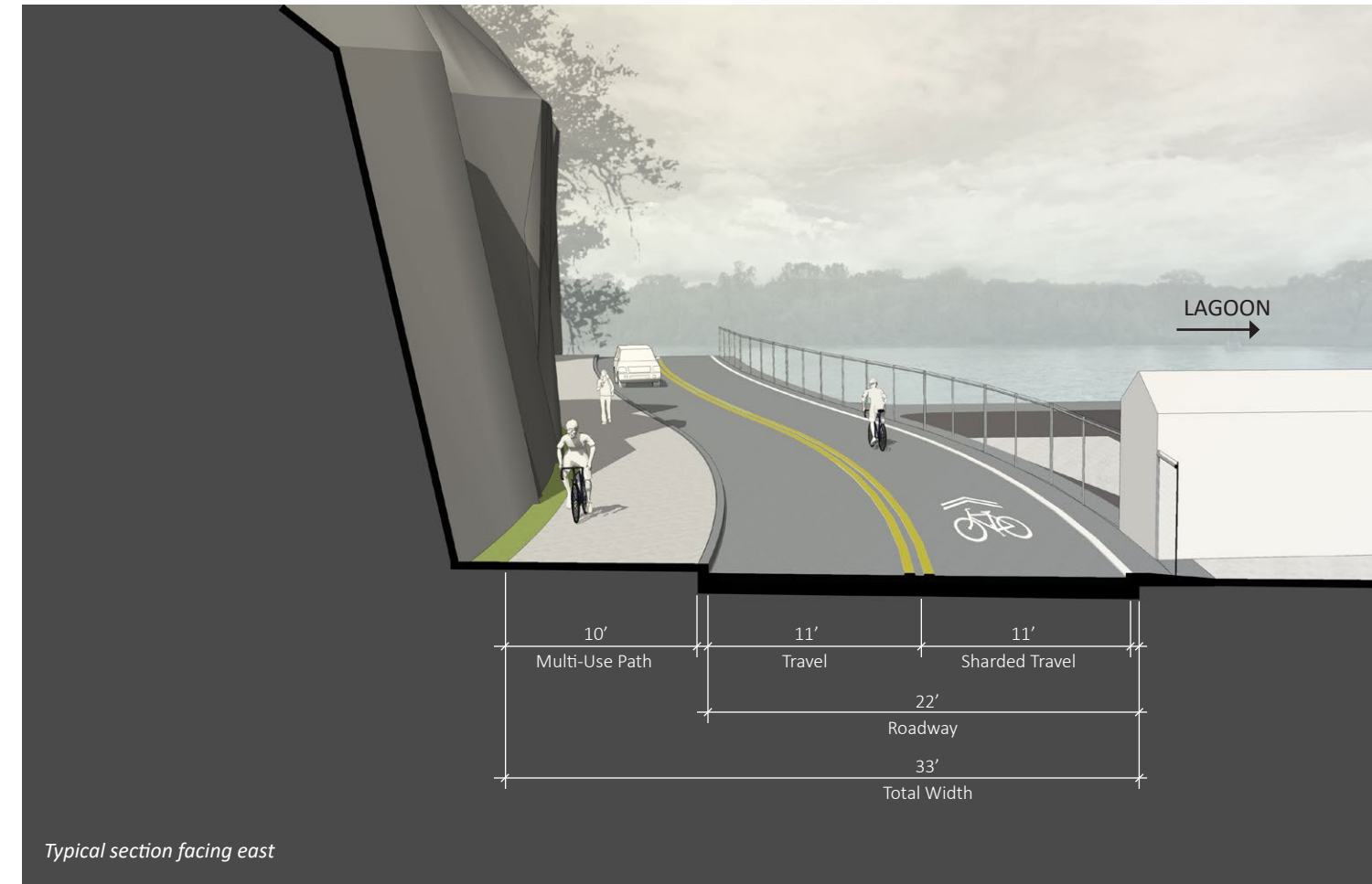


## SEGMENT 2.1: VENEER PROPERTY

## Recommended Street Section

The proposed road section contains two 11' travel lanes, one of which is shared with bicycle travel (the east-bound/southern lane), and a 10' multi-use path on the north side of the road, separated from the travel lanes by a landscape strip where space allows (varying in size depending on available space).

Implementation of the proposed road section will need to consider pedestrian crossings where the south side sidewalk ends at the south end of Segment 2.1, and how bicycle facilities will transition to adjacent segments.



## SEGMENT 2.2: PLYMOUTH STREET



**Proposed Segment 2.2 Plan**



**SEGMENT 2.2: PLYMOUTH STREET**

**Recommended Intersection**

For the intersection of Plymouth Street and S. 6<sup>th</sup> Street, Option A (stop controlled intersection, no splitter island) is recommended based on the evaluation.

This option provides superior through-movement and mobility for those accessing properties on S. 6<sup>th</sup> Street, and the lack of splitter island provides better emergency vehicle access.



**INTERSECTION: PLYMOUTH STREET & SOUTH 6<sup>TH</sup> STREET**



### Recommended Street Section

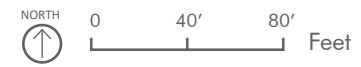
Roadway cross section Option B is the recommended design for this section. This option has superior ratings for improved connectivity and access, improved bicycle and pedestrian safety and accessibility, improved street appearance, and the potential to incorporate sustainable design principles.



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### Proposed Segment 3 Plan



### SEGMENT 3: PLYMOUTH STREET



## Recommended Intersection

Several options for improving this intersection were identified and evaluated. The project team narrowed them down to four options for evaluation. Based on further analysis and discussion with members of the advisory committee, Planning Commission, City Council and other community members, the project team developed a new preferred option.

This roundabout design allows for continued direct travel to both Old Portland Road and Plymouth Street. It has a smaller footprint than the other roundabout options evaluated, with less resulting impact on surrounding private properties and a lower cost to build compared to the earlier roundabouts studied.

Truck movements through the Plymouth Street/Old Portland Road intersection have been a key topic of discussion, and the roundabout has been designed to accommodate these vehicles through sufficient size and a mountable apron. The roundabout center is recommended to be non-mountable in order to provide space for a gateway feature.



## INTERSECTION: OLD PORTLAND ROAD & PLYMOUTH STREET

## Recommended Street Section

A new preferred option was identified for Old Portland Road through further discussion and refinement of the preliminary preferred option with members of the advisory committee, Planning Commission, City Council and other community members.

It includes one-way cycletracks on both sides of the street. The cycletracks are separated from the roadway by a landscaping strip. Each cycletrack will be separated from the adjacent pedestrian walkway by a curb or other means.

The new option has the same safety benefits of the original Option C but can be transitioned from adjacent segments more effectively. Implementation of this option will require careful planning to allow for safe convenient transitions between this design and sections of the roadway that have undergone recent improvements.



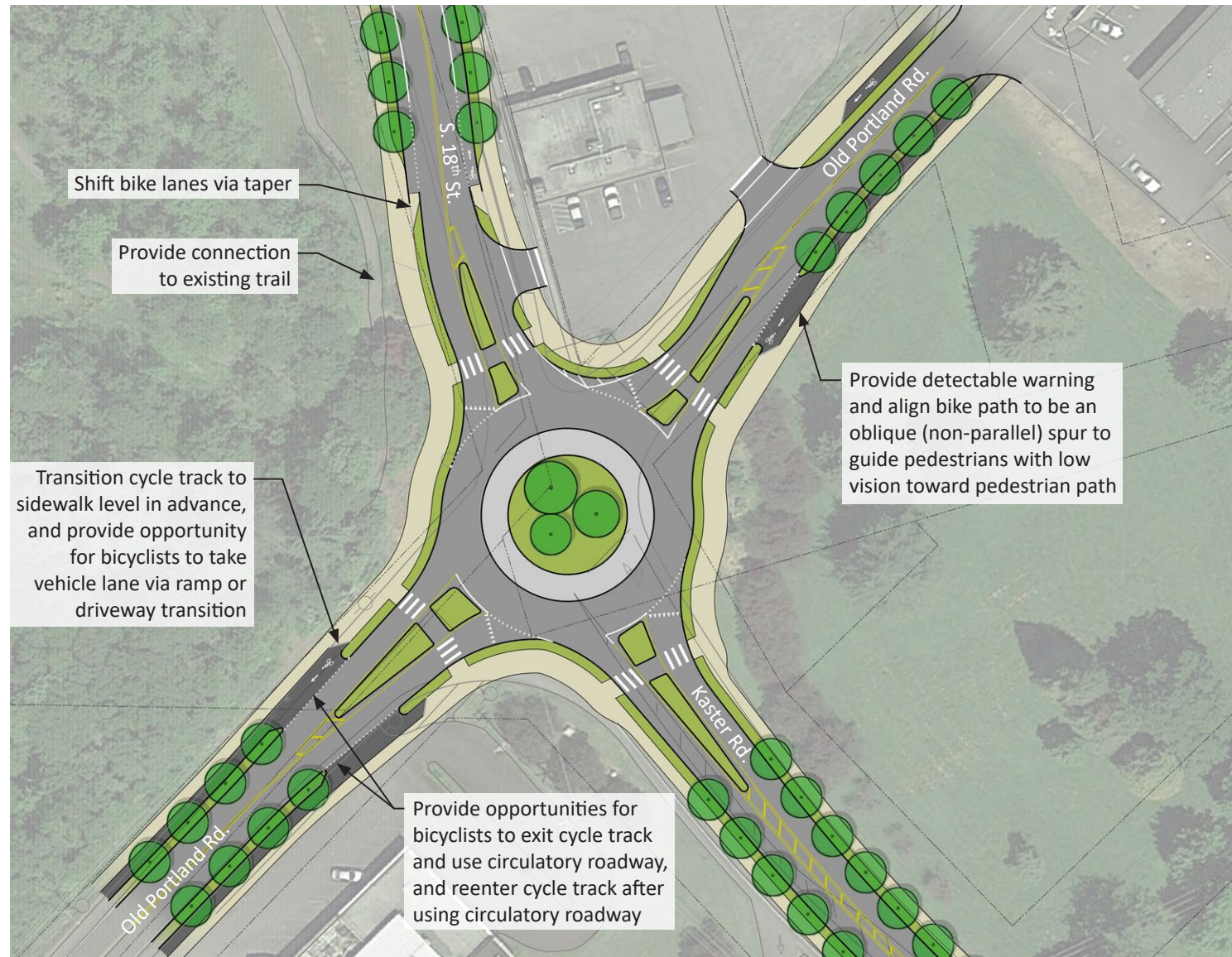
## SEGMENT 4.1: OLD PORTLAND ROAD



## Recommended Intersection

At the intersection of Old Portland Rd. and Kaster Rd. Option B (roundabout) is the preferred design, allowing for through-movement in all directions without queueing at a signal.

The roundabout serves as both a traffic calming function and as a gateway treatment while providing capacity comparable to a signalized intersection with separate left-turn lanes on all approaches.



## INTERSECTION: OLD PORTLAND ROAD & KASTER ROAD

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## Recommended Intersections

For clarity the recommended intersections of Old Portland Road with Gable Road and Port Avenue are shown together. In the Evaluation section on pages 66 through 72, the options for these two intersections were shown and evaluated separately.

### Old Portland Road & Gable Road

Several options for improving this intersection were identified and narrowed to two options for evaluation. Both options performed well in the evaluation; however, Option B performed slightly better. Based on further review and discussion with the project management team, Option B is the preferred near-term alternative.

- Option B provides greater separation from the railroad crossing as well as the Old Portland Road/Railroad Avenue and Old Portland Road/Port Avenue intersections relative to Option A.
- Option B, coupled with the planned improvements along Gable Road, provides a greater improvement in traffic operations (volume/capacity, delay, LOS) at the intersection relative to Option A.
- Option B does not require a traffic signal to achieve acceptable traffic



## INTERSECTIONS: OLD PORTLAND ROAD, GABLE ROAD & PORT AVENUE



operations in the future and therefore, costs significantly less relative to Option A.

The City should monitor changes in traffic and travel performance after improvements to the US 30/Millard Road intersection are implemented and/or other measures are successful in encouraging more drivers to use Old Portland Road to access the Riverfront area.

At the point that increased potential traffic on Old Portland Road warrants investment in additional improvements to this intersection, Option A may be evaluated further.

Consider incorporating protected intersection treatment options to improve transitions through the intersection and to the shared-use path at Old Portland Road.

### Old Portland Road and Port Avenue

At the intersection of Old Portland Road and Port Avenue, Option B (Re-Align with Two-Way Left-Turn Lane) is preferred. Option A is problematic from a transportation safety and mobility standpoint.

Consider incorporating protected intersection treatment options to improve transitions through the intersection.



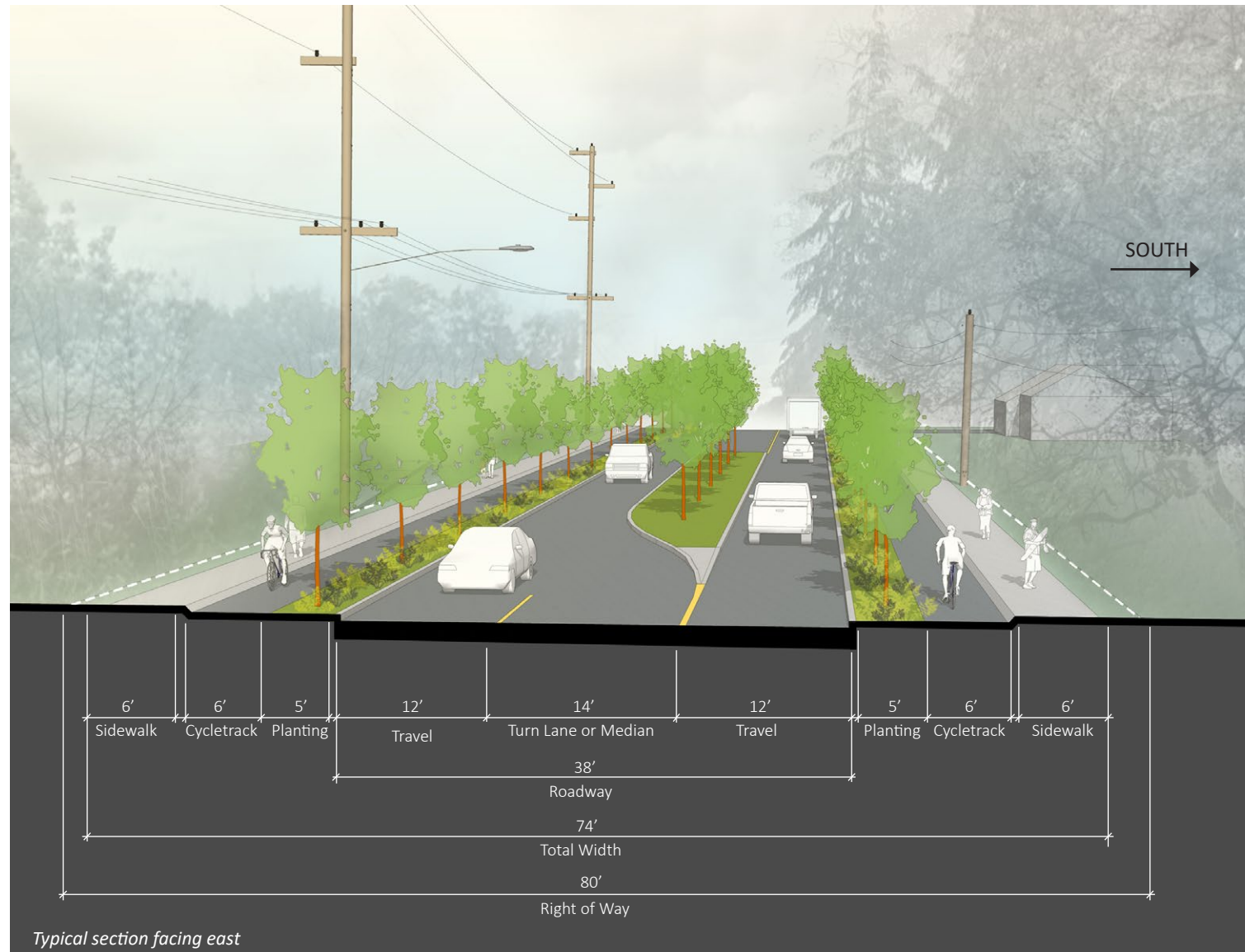
## Recommended Street Section

A new preferred option was identified through further discussion and review with members of the advisory committee, Planning Commission, City Council and other community members. It includes one-way cycletracks on both sides of the street.

The cycletracks are separated from the roadway by a landscaping strip. Each cycletrack will be separated from the adjacent pedestrian walkway by a curb or other means. The new option has the same safety benefits of the original Option C but can be transitioned from adjacent segments more effectively.

Implementation of this option will require careful planning to allow for safe convenient transitions between this design and sections of the roadway that have undergone recent improvements. Typical transitions will be illustrated in the Riverfront Connector Plan.

This cross-section also includes a center lane to accommodate turn lanes needed at key intersections or other access points to maintain traffic mobility. A landscaped median could be used in short portions of this segment but will need to be located to continue to ensure access to local businesses in this part of the corridor.



## SEGMENT 4.2: GABLE ROAD

## Recommended Intersection

Only one option was proposed for the intersection of Gable Road and McNulty Way.



## INTERSECTION: GABLE ROAD & MCNULTY WAY



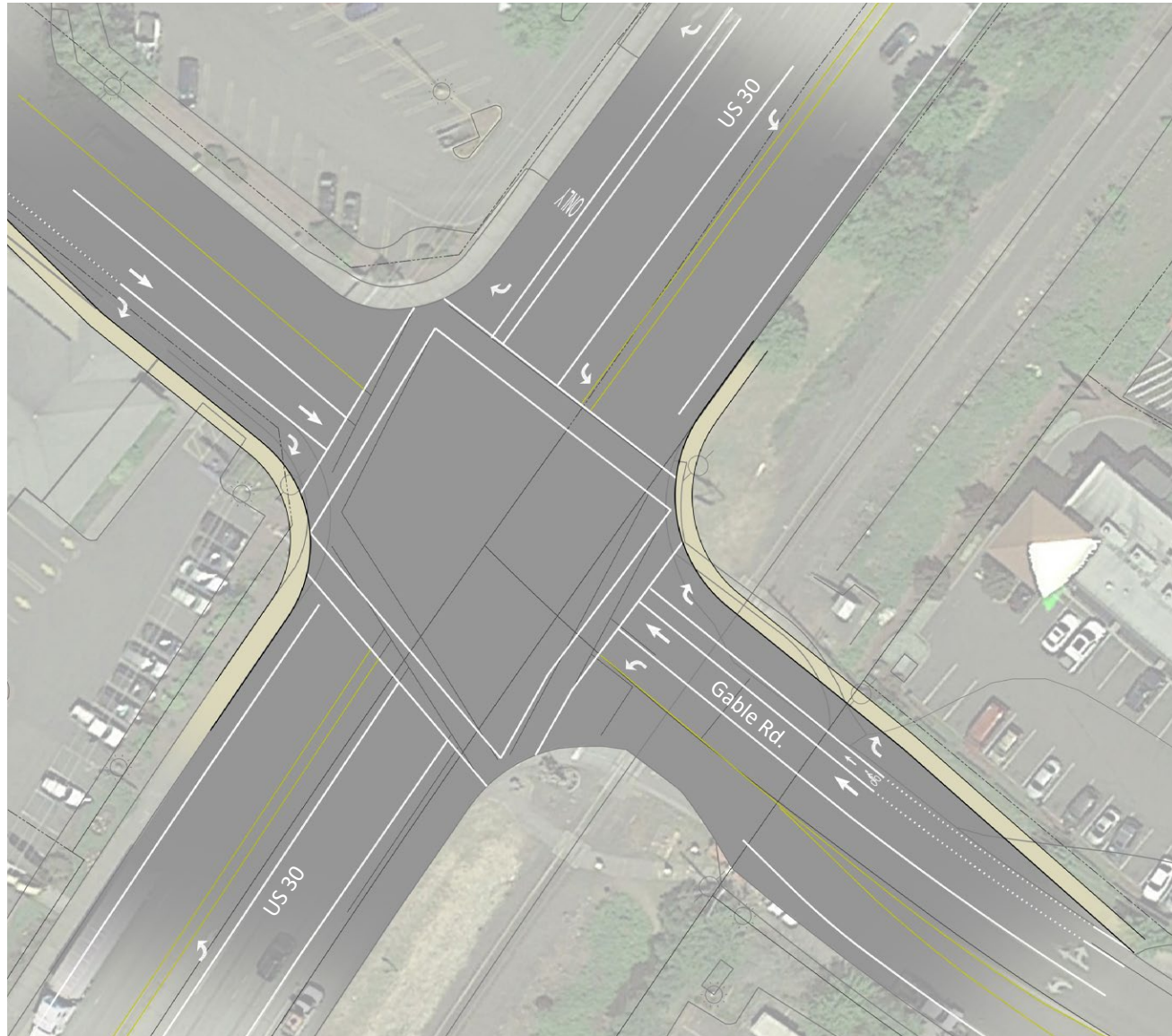
### Recommended Intersection

Only one option was proposed for the intersection of Gable Road and US 30.

Adding capacity at Millard Road/US 30 will reduce long-term turn movement demand at Gable Road/US 30.

Provide a separate westbound right-turn lane to separate westbound right-turn movements from through movements at the intersection. This will require reconfiguring the westbound approach to the intersection and potentially widening along Gable Road. The additional lane will also require coordination with ODOT rail, who may not be receptive to the additional lane without significant investment in rail infrastructure.

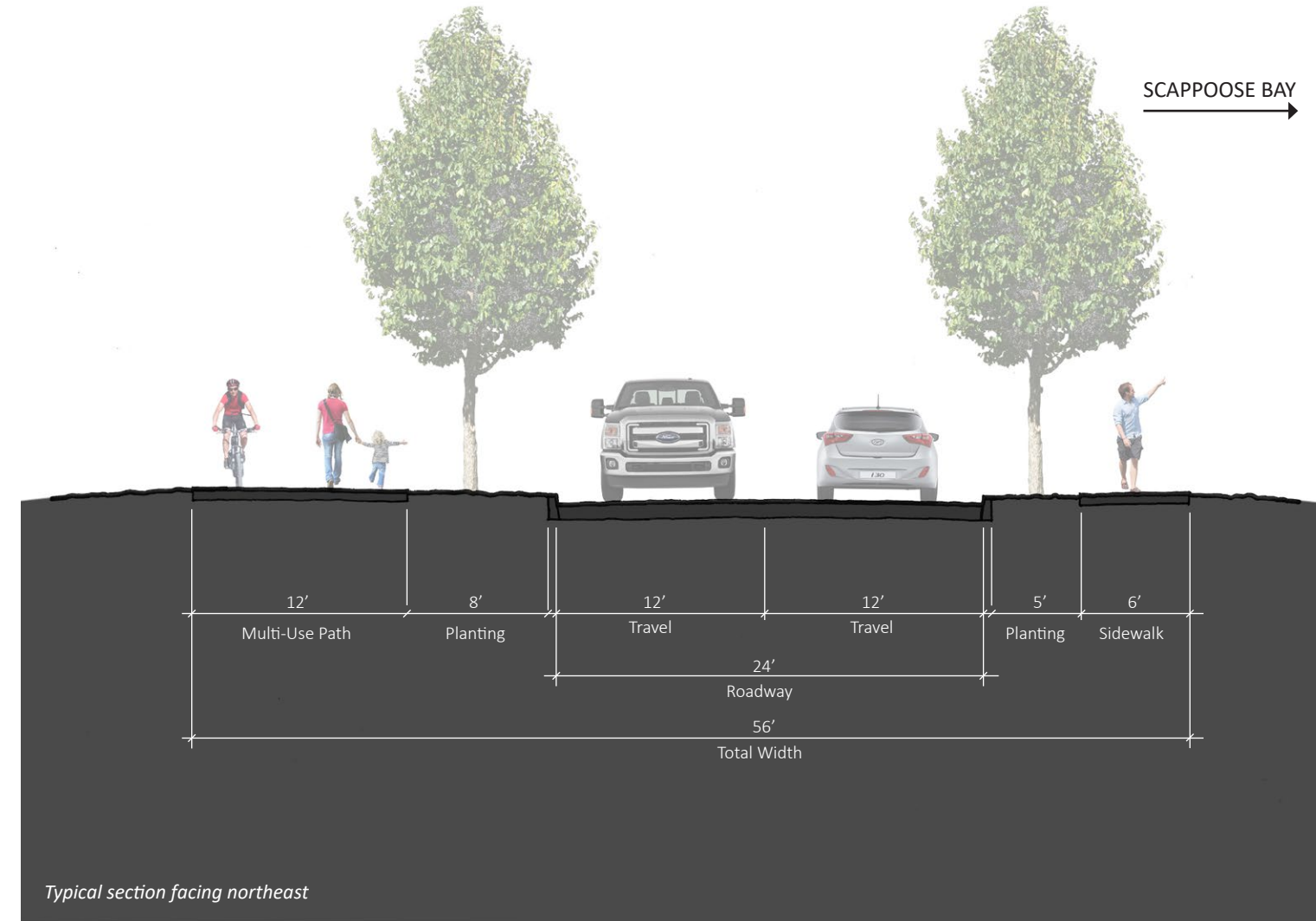
As an alternative, an eastbound right-turn lane could be considered when the bank in the southwest corner of the intersection redevelops. Either improvement will improve traffic operations at the intersection and provide much needed capacity for future growth; however, the additional capacity is not expected to be sufficient to carry the intersection through 2031; therefore, alternative performance measures should also be considered at the intersection.



### INTERSECTION: GABLE ROAD & US 30

### Recommended Street Section

The proposed designs for roadway cross sections and intersections in this area did not include alternatives to evaluate.

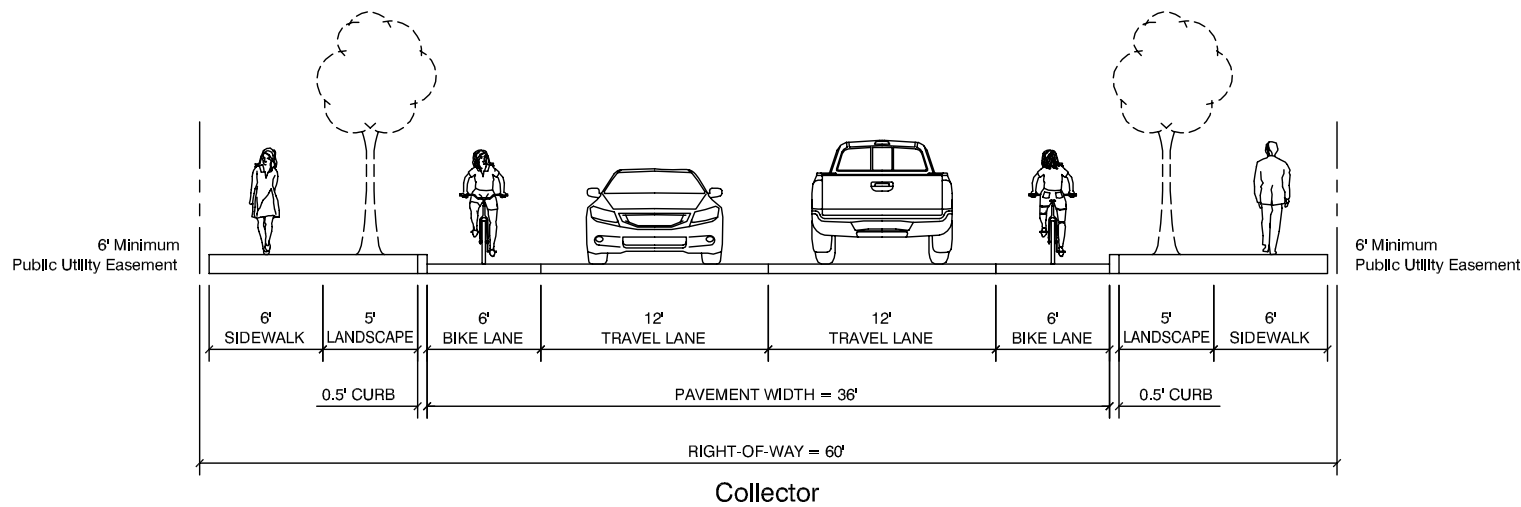


### SEGMENT 5: OLD PORTLAND ROAD



### Recommended Street Section

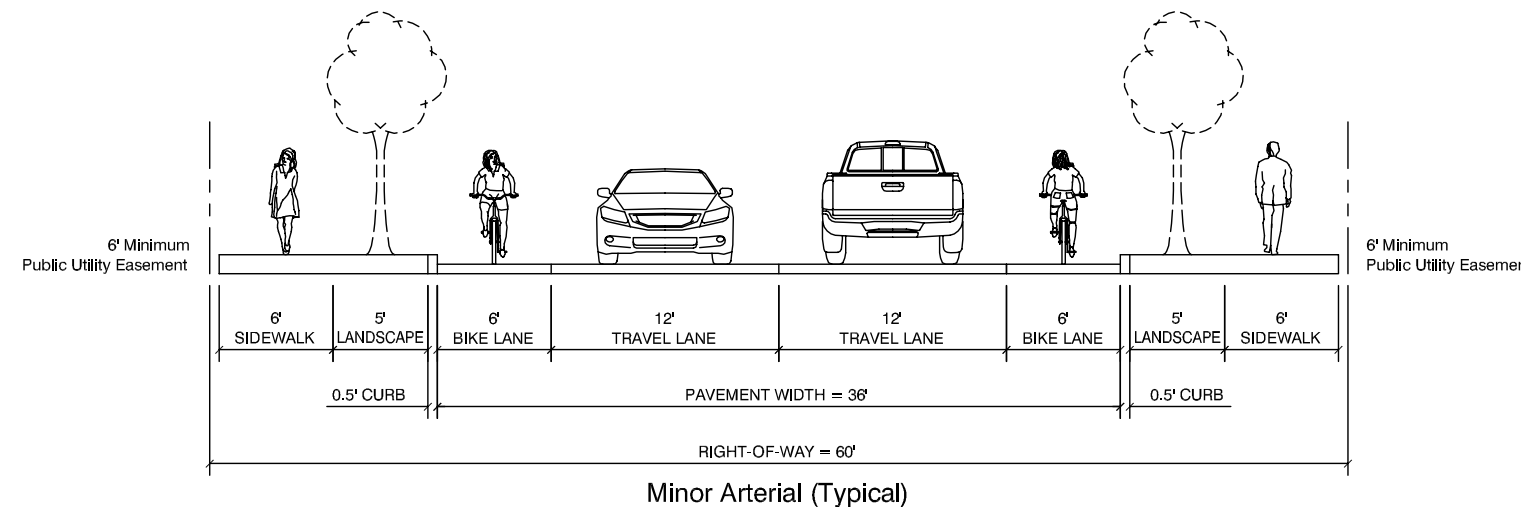
The proposed designs for roadway cross sections and intersections in this area did not include alternatives to evaluate.



Typical section

### Recommended Street Section

The proposed designs for roadway cross sections and intersections in this area did not include alternatives to evaluate.

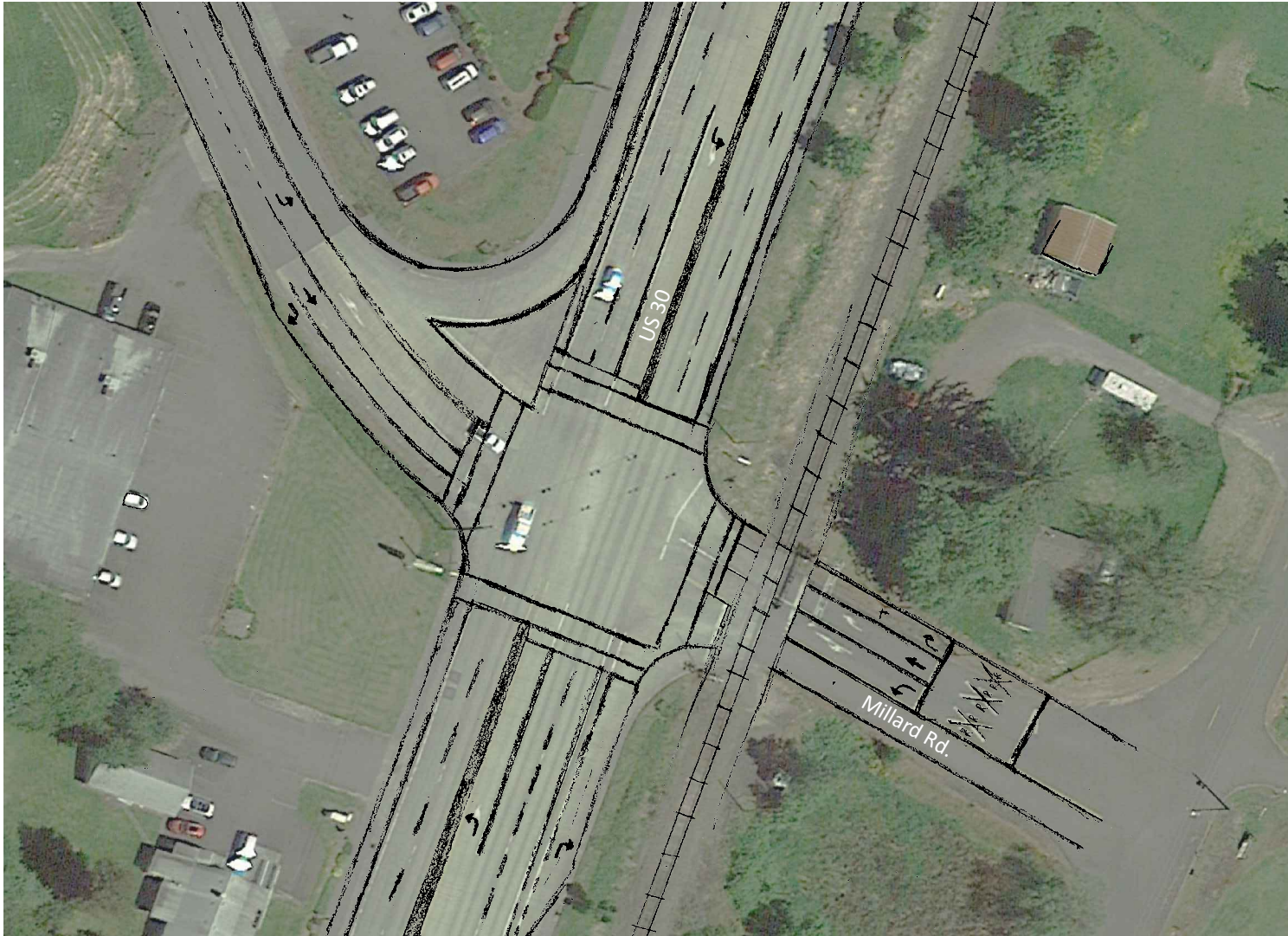


Typical section



### Recommended Intersection

Only one option was proposed for the intersection of Millard Road and US 30.



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### INTERSECTION: MILLARD ROAD & US 30



# LAND USE AND REGULATORY CHANGES

Following is a preliminary list of policy and regulatory changes that may be necessary to implement the recommended Design Options. This list is high-level and conceptual at this time, and will be refined as the recommended design options are reviewed and discussed by the community.

## Land Use and Zoning

No changes to zoning designations for properties along the corridor are recommended in order to achieve these design options. It is expected that land along the corridor will continue to develop consistent with existing zoning.

## Roadway Cross Sections

The City should consider updating the cross-sections contained within the Transportation System Plan to incorporate the recommended design options in order to require the appropriate improvements from property development along the corridor. The cross-sections of the recommended design options may also be appropriate for use in other locations within St. Helens.

The development code and Comprehensive Plan should include language that clarifies the relationship between the Riverfront Framework Plan and Riverfront Connector Plan in terms of proposed road cross-section designs. The Riverfront Connector Plan is generally consistent with the Framework Plan but includes more detailed information and alternatives to the designs identified in the Framework Plan. The information in the Riverfront Connector Plan will take precedence over the Framework Plan in this regard.

## Street Furniture & Pedestrian Amenity Requirements

The urban design of Segment 1 and 2.1 in the waterfront area should contribute to a cohesive sense of place. Specific design standards aiming to improve the public realm through this area could be achieved through an overlay district or changes to existing zoning regulations.

## Landscaping Requirements

Current development code regulations should be reviewed to see if they support the type and amount of landscaping contained in the recommended design options. Landscaping requirements can specify trees that are particularly suited to the soil conditions in the study corridor.

## Fee In-Lieu Requirements

The City's fee-in-lieu requirements for transportation improvements should be refined. Currently the required fee-in-lieu only covers the cost of providing new sidewalks associated with new development or redevelopment. The calculation of the fee should be evaluated and potentially refined to cover the full cost of road improvements if they are not installed as part of a development project. Fee-in-lieu and improvement requirements also must address proportionality and nexus requirements, consistent with land use case law decisions.



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# APPENDIX 1

Due to size, the Design Options Evaluation Notes are provided separately, both as a PDF file and an Excel spreadsheet.

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# APPENDIX 2

Wayfinding Recommendations														
ID #	Segment	Mode Type	Sign Type	Installation Street	Intersecting Street	Sign Facing	Destination #1	Destination #1	Destination #1	Destination #1	Destination #2	Destination #2	Destination #2	
								#1 Arrow	#1 Distance	#1 Time	Destination #2	#2 Arrow	#2 Distance	#2 Time
1	1	Bicycle/Pedestrian	On-Street Directional	South 1st Street	St. Helens Street	North	Riverfront Dist	Straight	0.1 mi	1 min	Courthouse	Left	0.1 mi	1 min
2	1	Bicycle/Pedestrian	On-Street Directional	St. Helens Street	South 1st Street	East	Houlton Bus Dist	Right	1.1 mi	7 min	Nob Hill Park	Left	0.7 mi	4 min
3	1	Bicycle/Pedestrian	On-Street Directional	South 1st Street	St. Helens Street	South	Houlton Bus Dist	Straight	1.1 mi	7 min	Boat Launch	Diagonal Right	0.3 mi	2 min
4	1	Pedestrian	On-Street Directional	South 1st Street	Plaza Square	North	City Hall	Left	0.1 mi	1 min	Columbia View Park	Left	0.1 mi	1 min
5	1	Pedestrian	Map Kiosk	South 1st Street	Plaza Square	East	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	2.2	Bicycle/Pedestrian	Trailhead Kiosk	Nob Hill Nature Park Trail	N/A	South	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	3	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	Plymouth Street	South	Riverfront Dist	Straight	0.6 mi	3 min	Historic Dist	Slight left (2nd roundabout exit)	0.7 mi	4 min
8	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 15th Street	North	Houlton Bus Dist	Right	0.4 mi	2 min	McCormick Park	Straight	0.4 mi	2 min
9	4.1	Bicycle/Pedestrian	On-Street Directional	South 15th Street	Old Portland Road	North	Riverfront Dist	Left	0.7 mi	4 min	Historic Dist	Left	0.8 mi	4 min
10	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 15th Street	West	Houlton Bus Dist	Left	0.4 mi	2 min	Riverfront Dist	Straight	0.7 mi	3 min
11	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 18th Street/Kaster Road	East	Houlton Bus Dist	Right	0.5 mi	3 min	McCormick Park	Right	0.1 mi	1 min
12	4.1	Bicycle/Pedestrian	On-Street Directional	South 18th Street	Old Portland Road	North	Riverfront Dist	Left	0.9 mi	5 min	Historic Dist	Left	1 mi	6 min
13	4.1	Bicycle/Pedestrian	On-Street Directional	Kaster Road	Old Portland Road	South	Houlton Bus Dist	Straight	0.5 mi	3 min	Riverfront Dist	Right	0.9 mi	5 min
14	4.1	Bicycle/Pedestrian	On-Street Directional	Old Portland Road	South 18th Street/Kaster Road	West	Houlton Bus Dist	Left	0.5 mi	3 min	Riverfront Dist	Straight	0.9 mi	5 min
15	4.1	Bicycle/Pedestrian	Trailhead Kiosk	Old Portland Road	N/A	South	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	4.1	Bicycle	On-Street Confirmation	Old Portland Road	Gable Road	East	Scappoose Bay	Left	N/A	N/A	N/A	N/A	N/A	N/A
17	4.2	Bicycle	On-Street Confirmation	Gable Road	Old Portland Road	West	Scappoose Bay	Right	N/A	N/A	N/A	N/A	N/A	N/A
18	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	McNulty Way/Milton Way	East	CC Mental Health	Left	0.1 mi	1 min	State Police	Left	0.2 mi	1 min
19	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	McNulty Way/Milton Way	West	Houlton Bus Dist	Straight	1.3 mi	7 min	Riverfront Dist	Straight	1.7 mi	9 min
20	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	Highway 30	East	Houlton Bus Dist	Right	0.9 mi	5 min	Chamber of Com	Right	0.9 mi	5 min
21	4.2	Bicycle/Pedestrian	On-Street Directional	Gable Road	Highway 30	West	Houlton Bus Dist	Left	0.9 mi	5 min	Riverfront Dist	Straight	2 mi	9 min
22	5	Vehicle	Vehicular Directional	Old Portland Road	Gable Road/Old Portland Road	South	Houlton Bus Dist	Right	1 mi	3 min	Riverfront Dist	Right	1.4 mi	4 min
23	5	Vehicle	Vehicular Directional	McNulty Way	Gable Road	South	Houlton Bus Dist	Right	1.3 mi	3 min	Riverfront Dist	Right	1.7 mi	5 min
24	5	Vehicle	Vehicular Directional	Millard Road	Old Portland Road	North	Riverfront Dist	Left	2.5 mi	6 min	Historic Dist	Left	2.6 mi	6 min
25	5	Vehicle	Vehicular Directional	Old Portland Road	Millard Road	South	Houlton Bus Dist	Straight	2.1 mi	4 min	Riverfront Dist	Straight	2.5 mi	6 min
26	5	Vehicle	Vehicular Directional	Highway 30	Millard Road	South	Riverfront Dist	Right	2.9 mi	7 min	Historic Dist	Right	3 mi	6 min

## Complete Wayfinding Matrix

Destination #3	#3 Arrow	#3 Distance	#3 Time	Destination #4	#4 Arrow	#4 Distance	#4 Time	Destination #5	#5 Arrow	#5 Distance	#5 Time	Destination #6	#6 Arrow	#6 Distance	#6 Time
McCormick Park	Straight	1.2 mi	7 min	Library	Straight	1.2 mi	7 min	Chamber of Com	Right	1.4 mi	10 min	N/A	N/A	N/A	N/A
Grey Cliffs Park	Diagonal Right	0.3 mi	2 min	McCormick Park	Left	1.1 mi	6 min	Library	Left	1.1 mi	6 min	Chamber of Com	Straight	1.3 mi	9 min
Public Docks	Left	0.1 mi	1 min	History Museum	Left	0.1 mi	1 min	Nob Hill Park	Straight	0.7 mi	6 min	Armory	Straight	0.8 mi	4 min
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nob Hill Park	Straight	0.5 mi	3 min	Boat Launch	Slight left (2nd roundabout exit)	1.1 mi	6 min	Grey Cliffs Park	Slight left (2nd roundabout exit)	1.2 mi	7 min	Courthouse Plaza	Slight left (2nd roundabout exit)	0.9 mi	4 min
Senior Center	Right	0.1 mi	1 min	Library	Straight	0.4 mi	2 min	Veteran's Memorial	Straight	0.5 mi	2 min	Sheriff's Office	Straight	0.7 mi	4 min
McCormick Park	Right	0.3 mi	2 min	Nob Hill Park	Left	0.6 mi	3 min	Courthouse Plaza	Left	1 mi	5 min	Boat Launch	Left	1.2 mi	6 min
Historic Dist	Straight	0.8 mi	4 min	Senior Center	Left	0.1 mi	1 min	Nob Hill Park	Straight	0.5 mi	3 min	Columbia View Park	Straight	1.1 mi	7 min
Library	Right	0.1 mi	1 min	Veteran's Memorial	Right	0.3 mi	2 min	Sheriff's Office	Straight	0.5 mi	3 min	State Police	Straight	1.1 mi	6 min
Nob Hill Park	Left	0.8 mi	4 min	Boat Launch	Left	1.4 mi	8 min	Sheriff's Office	Right	0.5 mi	3 min	State Police	Right	1.1 mi	6 min
Historic Dist	Right	1 mi	6 min	McCormick Park	Straight	0.1 mi	1 min	Nob Hill Park	Right	0.8 mi	4 min	Boat Launch	Right	1.4 mi	8 min
Historic Dist	Straight	1 mi	6 min	McCormick Park	Left	0.1 mi	1 min	Nob Hill Park	Straight	0.8 mi	4 min	Boat Launch	Straight	1.4 mi	8 min
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Campbell Park	Straight	1.2 mi	7 min	Fairgrounds	Straight	2.4 mi	15 min	High School	Straight	0.4 mi	3 min	Public Health	Straight	0.4 mi	3 min
Historic Dist	Straight	1.8 mi	10 min	McCormick Park	Straight	1 mi	5 min	CC Mental Health	Right	0.1 mi	1 min	State Police	Right	0.2 mi	1 min
Urgent Care	Right	1.2 mi	7 min	Transit Center	Right	1.8 mi	8 min	Fairgrounds	Straight	2.2 mi	13 min	High School	Straight	0.1 mi	1 min
Historic Dist	Straight	2.1 mi	10 min	Urgent Care	Left	1.2 mi	7 min	McCormick Park	Straight	1.2 mi	7 min	Nob Hill Park	Straight	1.9 mi	9 min
Historic Dist	Right	1.5 mi	5 min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Historic Dist	Right	1.8 mi	4 min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scappoose Bay	Right	0.5 mi	1 min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Historic Dist	Straight	2.6 mi	6 min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Houlton Bus Dist	Straight	1.6 mi	3 min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A