

# West Linn Willamette Falls Drive 2021 Conceptual Design Plan

City of West Linn, Oregon

July 2021



# Acknowledgements

*Production of this document has been through the collective effort of the following people*

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*The content of this document does not necessarily reflect views or policies of the State of Oregon*



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# Project Purpose and Background

The West Linn Willamette Falls Drive (WFD) 2021 Conceptual Design Plan is an outcome of a multimodal corridor planning effort to develop continuous bicycle and pedestrian facilities along the Lake Oswego Highway (OR 43) and Willamette Falls Drive (WFD). This plan utilized a process similar to the 2016 West Linn OR 43 Conceptual Design Plan and builds upon its goals and objectives as well as the recently completed Historic Willamette Falls Drive project.

This report documents the **West Linn WFD 2021 Conceptual Design Plan** and identifies necessary modifications to the existing 2016 West Linn Transportation System Plan (TSP) to implement the plan.

## I. PROJECT PURPOSE

WFD is a City of West Linn (City) operated facility which runs from the Tualatin River at its western limits to the interchange of Interstate 205 (I-205) and OR 43 at its eastern limits. WFD is classified as a Minor Arterial in the City's TSP, and is, for the majority of the roadway, a two-lane facility (one lane in each direction) with little to no shoulders and no pedestrian or bicycle facilities with the exception of the recently reconstructed section through the historic downtown area (10<sup>th</sup> Street to 16<sup>th</sup> Street).

### Project Objectives

The purpose of this project was to develop a multi-modal conceptual design plan for WFD that adequately accommodates bicycles, pedestrians, and vehicles.

The stated objectives for the project, similar to the West Linn OR 43 Conceptual Design Plan, are:

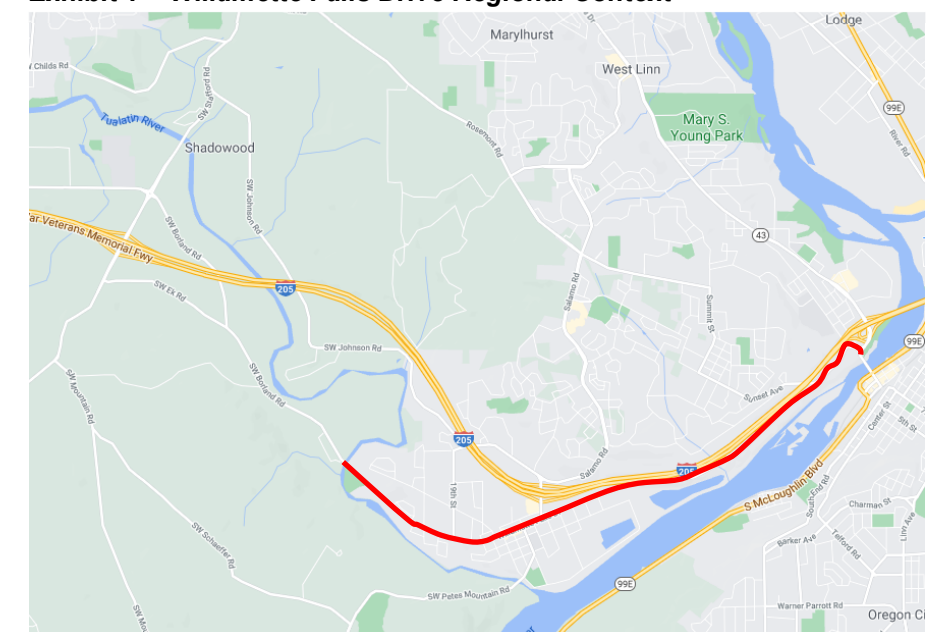
- Develop conceptual plans for a design treatment along WFD in the project area to better accommodate all travel modes along and across the street and to support adjacent land use.
- Create a corridor that will encourage the use of alternative transportation modes and reduce reliance on automobiles.
- Improve the aesthetic environment, pedestrian crossing opportunities, and pedestrian-transit connections along WFD.
- Improve vehicular access to properties abutting WFD while promoting bicycle and pedestrian safety.
- Ensure consistency with adopted plans, policies, and standards, including the *Regional Transportation Plan*, the *West Linn System Transportation Plan*, the *West Linn Comprehensive Plan*, and the latest national standards including the *NACTO Urban Bikeway Design Guide*.
- Identify planning-level estimates to design and construct the final conceptual design.
- Coordinate and obtain guidance near the I-205 interchange in relation to the future redevelopment of the area including connection with the future I-205 corridor widening project.

### The Study Area

The project study area spans approximately 3.8 miles along the WFD corridor within the City of West Linn, from the Tualatin River (near Fields Bridge Park) at the western project limits to the interchange of I-205/OR 43 at the eastern project limits. The downtown corridor (10<sup>th</sup> Street to 16<sup>th</sup> Street) is part of a separate project.

For much of this route, WFD passes through lower-density, single family residential areas. However, it also passes through a general commercial area through the downtown section (10<sup>th</sup> Street to 16<sup>th</sup> Street) and a large general industrial area from 6<sup>th</sup> Street to Sunset Ave. The eastern project limits are also designated as a general commercial area. The downtown area is not included within the study area.

**Exhibit 1 – Willamette Falls Drive Regional Context**





# I. Project Purpose and Background



*Sidewalks and bike lanes end east of Fields Bridge Park. There is a small shared use path that connects non-vehicular users to the park indirectly.*

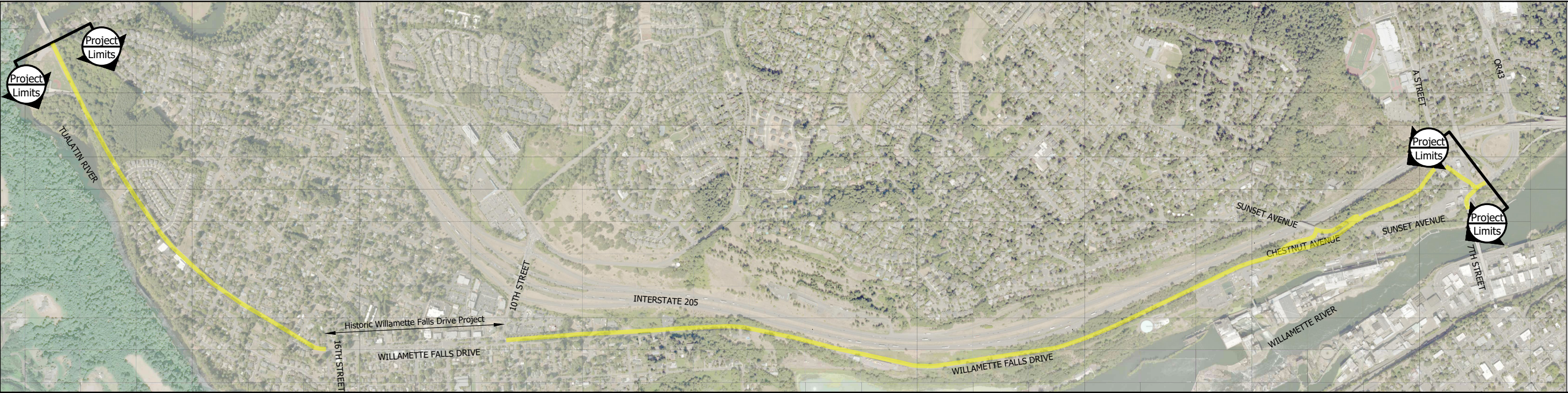


*Sidewalks are only on the north side of WFD from Epperly Way to just west of downtown and bike lanes are either non-existent or shared with on street parking or minimal shoulders.*



*There are no sidewalks or bicycle facilities from 6<sup>th</sup> Street to the I-205 interchange on WFD.*

**Exhibit 2 – Willamette Falls Drive Study Area**





# I. Project Purpose and Background

## The 2021 Plan Development Process

The plan update has been ongoing for a year and a half from March 2019 with an expected adoption occurring in late 2021, and engaged stakeholders from the City, external agencies, and members of the public, to reach the preferred layout for the WFD corridor.

The project team reviewed prior planning efforts, specifically the development of the 2016 OR 43 Concept Design Plan to aid in the development of the 2021 Concept Design Plan.

From community and stakeholder outreach, it was determined that a “continuous separated bikeway” would be a key component for the design along the WFD corridor. The separated bikeway is necessary to connect the different neighborhoods and zoning areas along the WFD corridor and encourage users of all ages and abilities to utilize active transportation modes.

## Review of Best Practices

The design team also reviewed published guidance on best practices for designing and incorporating separated bicycle facilities and incorporating them into existing roadway facilities:

- *The Centre for Research and Contract Standardization in Civil and Traffic Engineering (CROW) Design Manual for Bicycle Traffic* (Netherlands, 2017)
- *National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide* (2012)
- *NACTO Urban Street Design Guide* (2013)

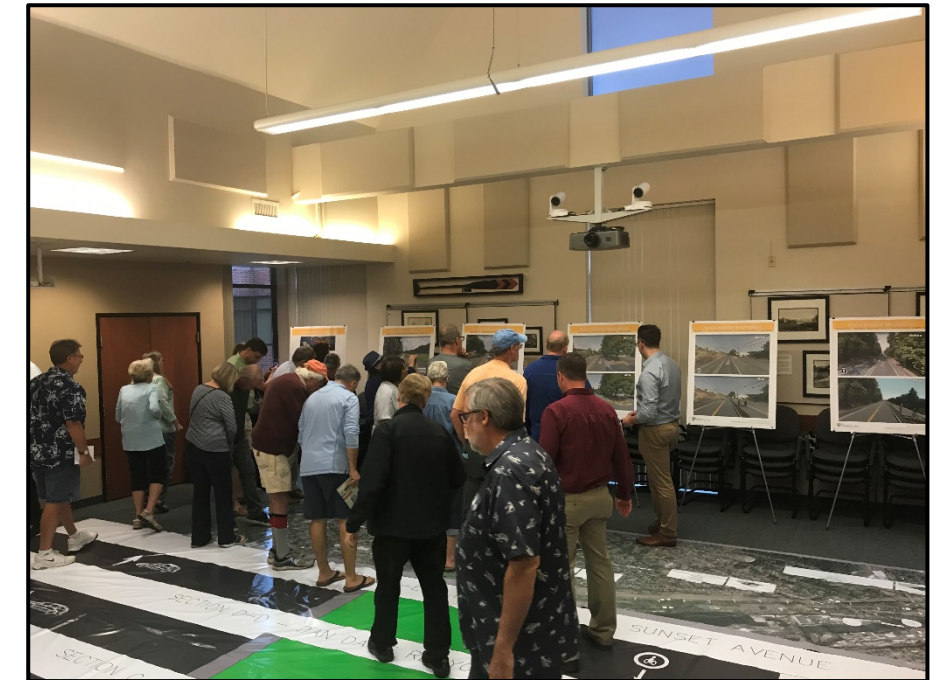
- *The Federal Highway Administration Separated Bicycle Lanes Planning and Design Guide* (2015)

Through review of this published guidance, it was determined, that the 2021 Concept Plan would recommend including separated bicycle facilities for the full length of the corridor, similar to the 2016 Concept Plan.

## Public Outreach

The project team held an open house to discuss the proposed corridor segment alternatives in August 2019. Over 50 community members attended the open house and provided input on the proposed design elements and segment alternatives.

The input gathered from this meeting highlighted the importance of connectivity and safety for all modes of transportation along this corridor.



**Public Open House - August 9, 2019**



# I. Project Purpose and Background

## Existing Conditions

The initial phase in the project involved identifying and analyzing existing conditions within the corridor.

## Varying Land Use

Land use context within the WFD corridor, generally falls under three categories: Residential, General Commercial, or General Industrial.

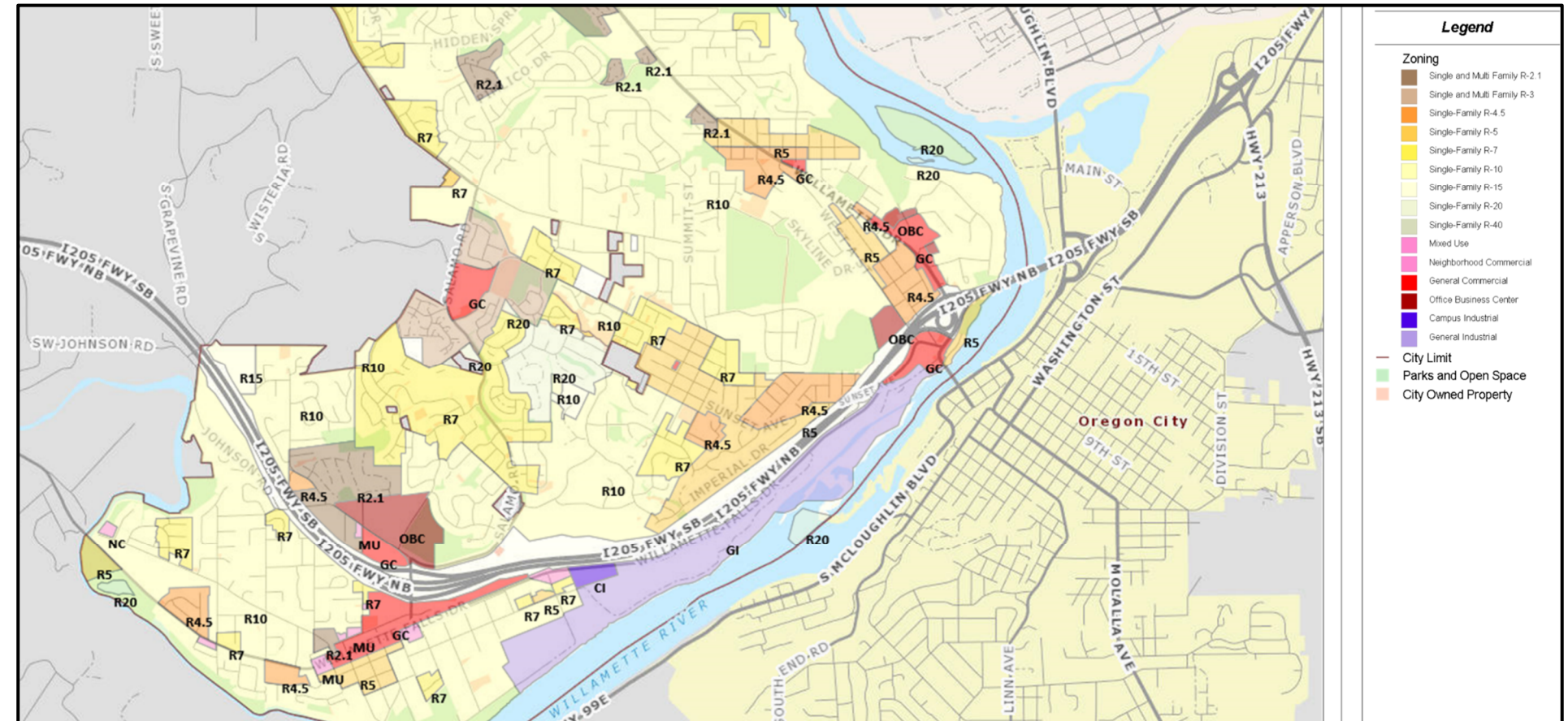
The two portions of the corridor that fall under the commercial context are the downtown limits (10<sup>th</sup> Street to 16<sup>th</sup> Street) and the interchange area that could undergo further rezoning as part of the Industrial Heritage District and Historic City Hall District areas. The portion of the project that is zoned industrial stretches from 6<sup>th</sup> Street to Sunset Avenue.

## Current Pedestrian Environment

Sidewalks along WFD are not consistent throughout the corridor. The western project limits either have sidewalk on one side or the other – never both – and are missing entirely in some areas. The eastern project limits (6<sup>th</sup> Street to the I-205 interchange) have no sidewalks at all, creating a significant gap in what should be a continuous pedestrian system.

There are some areas that include a separated shared-use path intended for both cyclists and pedestrians; however, it is a very limited area and not continuous throughout the corridor creating an unsafe pedestrian route for users attempting to walk the corridor.

Exhibit 3 - Willamette Falls Drive Existing Land Use Areas



There are also areas where the sidewalk abruptly ends that would benefit from continuity for access to key commercial parts of the City (see image to the right that is just west of downtown, which is the only sidewalk along WFD through this area). Currently users have very little shoulder to share with vehicles and cyclists.



Sidewalk ends short of connection to downtown



# I. Project Purpose and Background

## Current Bike Facilities

Bicycle facilities are also intermittent along WFD. There are very few dedicated bicycle travel facilities along a very heavily used east-west bicycle travel route. There are opportunities along the corridor to provide more continuous, standard facilities that would encourage more alternative vehicle use in the area.

The areas that do provide a dedicated bicycle facility (mainly directly west of Ostman Street on the north side of WFD) are directly next to on street parking locations making it difficult for users to understand the facility context.

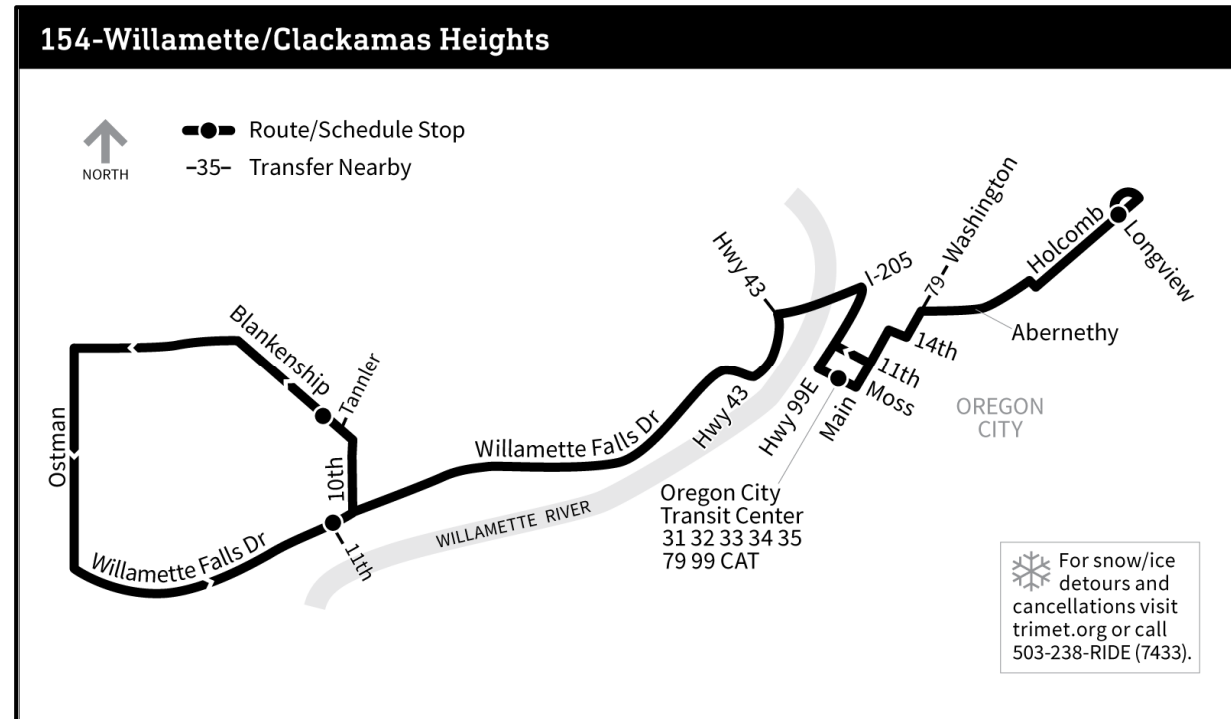
## Transit Service and Facilities

TriMet operates the #154 line through the project limits. The #154 line is a relative low-density line, but the stops along the route have the opportunity to be improved with the project.

Key design considerations will be made with regards to bus stops as separated facilities need additional consideration for access and maneuverability

## Environmental Conditions

WFD is located on a significant slope for the majority of the corridor creating constraints with stormwater runoff. It will be a key design consideration to collect and treat the roadway runoff prior to discharging down any steep slopes to mitigate potential erosion.



TriMet route #154 along WFD



Existing stop along route #154 at 19<sup>th</sup> Street and WFD



# The Plan

## II. THE PLAN: GENERAL CONCEPTS

This 2021 Plan is intended to provide a roadmap for upgrading WFD to provide continuous pedestrian and bicycle facilities and transit access throughout the corridor. This section summarizes the general concepts and approach for the plan.

### General Plan Characteristics

The 2021 Plan introduces consistent cross sections throughout the WFD corridor: typical and constrained.

The typical cross section is intended to be used in areas that do not have significant grade concerns, this is mainly the area west of the historic downtown district and east of the Tualatin River.

The constrained cross section is to be used in areas that present a significant challenge due to existing topography. These areas are located east of 6<sup>th</sup> Street and west of Sunset Ave. The cross sections are shown in Exhibit 4. Both cross sections were developed to provide the following key features:

- Comfortable bicycle facilities grade-separated from motor vehicle traffic.
- Continuous sidewalks on both sides of the street, adjacent to the bicycle facilities. The exception to this is 6<sup>th</sup> Street to Sunset Avenue as there is not developable R/W on the north side of WFD. This section follows the constrained cross section outlined in Exhibit 4.

### Typical Cross Section

The typical preferred cross section consists of six-foot sidewalks, separated bike lanes, a landscape buffer, and one motor vehicle travel lane in each direction.

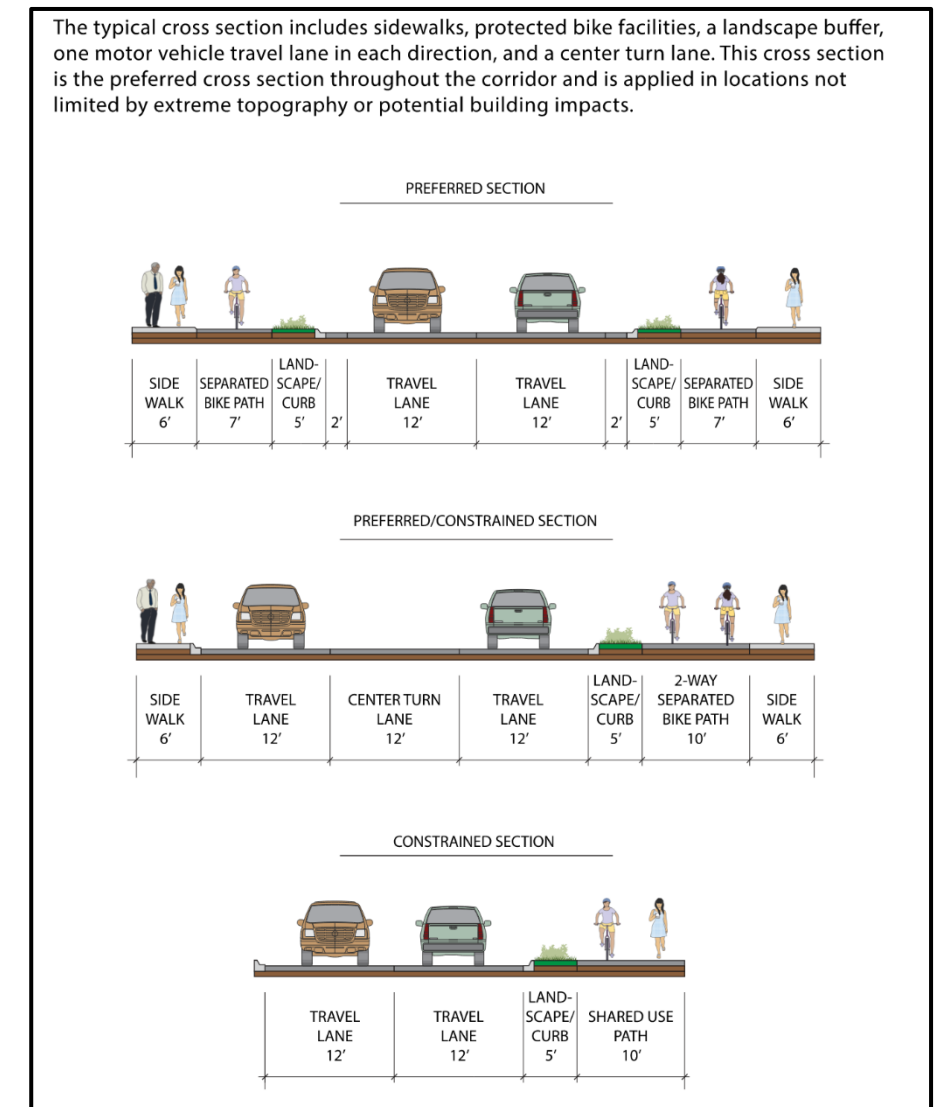
The typical preferred cross section is applied in areas not limited by topography. As development occurs along the corridor, property owners shall either construct or dedicate sufficient right of way and pay fee in lieu of construction for the typical section.

### Constrained Cross Section

The constrained cross section is similar to the typical preferred cross section in that it will include a landscape buffer (where possible) and a vehicle travel lane in each direction. However, due to steep topography along WFD, the constrained cross section includes a 10-foot shared use path to accommodate non-vehicular users rather than individual sidewalk and separated bike facilities.

In some cases, a combination of the preferred and constrained cross section will be utilized by providing a two-way separated bike lane on one side of the roadway and sidewalks on both sides with an optional center turn lane. This option is shown in Exhibit 4 as well as Preferred/Constrained. The constrained or preferred/constrained cross sections may only be applied with the approval of the City Engineer.

**Exhibit 4 - Proposed Cross Sections**



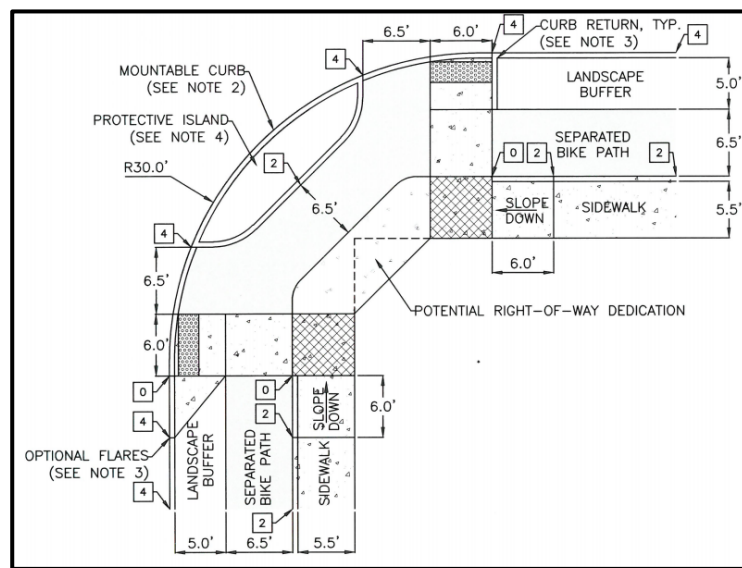
## II. The Plan: General Concepts

### Pedestrian Improvements

WFD is currently an automobile-focused roadway. It is missing many pieces to be fully pedestrian connected. One of the primary changes associated with the 2021 Plan is to implement a consistent pedestrian walkway from the Tualatin River to I-205. Pedestrian and bike facilities in the project area are defined as substandard or completely lacking in the 2014 Metro Regional Transportation Plan and deficiencies are also noted in the City's TSP.

### Improved Pedestrian Crossings

The final concept design for the 2021 Plan includes new protected intersections at all major crossing locations along WFD. The 2021 Concept Plan utilizes new standard details published by the City to ensure bicycles and pedestrians are visible and protected while crossing vehicular travel lanes.



City Standard Drawing WL-BI011 - Separated Bike Path at Intersection

### Continuous, High-Quality Sidewalks

Providing continuous sidewalks along the WFD corridor is one of the main priorities associated with the 2021 Plan. The majority of the project corridor is missing sidewalks, or includes substandard sidewalks, making pedestrian travel difficult for all users. The sidewalk is missing entirely east of 6<sup>th</sup> Street and from the western limits of downtown to 19<sup>th</sup> Street limiting the accessibility of a key commercial area of West Linn.

To improve the overall quality and buffer of pedestrian facilities, existing curb-tight sidewalks will be re-constructed with sidewalks that are set back from the roadway, separated by planting strips and bike lanes.

### Bike Improvements

Bicycle facilities along WFD are in a similar state as the sidewalk facilities; substandard and lacking altogether in most segments along the corridor.

Throughout the design process it has been the intention to provide separated facilities since most of the community has voiced their support, increasing safety for all levels of cyclists along the corridor. The final concept plan proposes the construction of grade separated bike lanes to clearly delineate different travel modes along the corridor. The separated bike lanes will increase safety of both cyclists and pedestrians by vertically and horizontally separating facilities.

### Transit

Coordination on improvements to existing bus stops along the Trimet #154 line have been ongoing through the development of the 2021 Concept Plan.

All stops will undergo a more detailed evaluation as the design is furthered, but all stops to include considerations necessary with distinct separation of the pedestrian and bicycle facilities.

### Aesthetic Improvements

Opportunities to introduce or maintain vegetation along the WFD corridor exist and will be at the forefront of the design as the project progresses. As WFD is mainly a residential roadway, the community members will expect a visually appealing roadway that makes it easy to use alternative transportation methods.

In addition to landscaping, the City wishes to incorporate decorative poles and arms at any signalized intersections to have a consistent and uniform appearance throughout the community.



## II. The Plan: General Concepts

### Operational and Traffic Control Improvements

The design team explored the geometric and functional layouts of the following intersections along the Willamette Falls Drive corridor:

- Chestnut Street & Sunset Avenue
- Sunset Avenue & West A Street
- Sunset Avenue & OR43

These three intersections will be part of a new horizontal and vertical configuration of roadways adjacent to the old Mill Site Development. The detailed layout figures in Part III cover the proposed configuration through the development area.

### Recommended Design and Assumptions

#### Chestnut Street & Sunset Avenue

The recommended layout for the intersection of Chestnut Street and Sunset Avenue is to construct the intersection as a two-way stop-controlled intersection with separate left- and right-turn lanes at the northbound approach, a shared through/right-turn lane at the eastbound approach, and a separate left-turn lane and through lane at the westbound approach.

#### Sunset Avenue & West A Street

The ideal recommended layout for the intersection of Sunset Avenue and West A Street is to construct the intersection as a single lane roundabout with shared left/right lanes at the southbound approach, a shared through/right-turn lane at the eastbound approach, and a shared left/through lane at the westbound approach.

The preferred layout at this intersection causes significant grading issues due to the steep topography through this segment of the corridor. As such, the current proposed layout of the intersection will be a signalized intersection with dedicated lanes for left and right turns for the southbound approach, dedicated left-turn lane and through lane for the eastbound approach, and a through/right-turn lane for the westbound approach.

This configuration operates similarly to the preferred, roundabout option under both existing and future conditions.

#### Sunset Avenue & OR43

The recommended layout for the intersection of Sunset Avenue and OR43 is to construct the intersection as a two-lane roundabout with separate left- and right-turn lanes at the northbound approach, separate through and right-turn lanes at the eastbound approach, and separate left and through lanes at the westbound approach.

This intersection should not be developed into a roundabout until the intersection of I-205/OR43 is developed into a roundabout, as the current signalized configuration of I-205/OR43 could result in queueing that adversely impacts the Sunset Avenue/OR43 roundabout. In this case, the Sunset Avenue/OR43 intersection should be developed as an interim signalized intersection until the I-205/OR43 intersection is developed into a roundabout.

### Stormwater Improvements

The majority of the WFD corridor does not currently have a main conveyance stormwater line in the existing roadway, the exception being the western project limits. The segment of WFD east of downtown, currently flows from the roadway into a ditch on the north side of WFD and then on to a steep embankment on the south side of the road where it ultimately discharges into the Willamette River.

## II. The Plan: General Concepts

### **Stormwater Conveyance Improvements**

Implementation of the 2021 Plan design cross sections will require the installation of new curb and drainage conveyance systems where existing facilities are unable to be utilized. Additionally, any areas that are not currently being properly conveyed, or are being conveyed in undersized/inadequate facilities, will be replaced as part of the project improvements.

### **Stormwater Quality and Quantity Improvements**

The City's Storm Drainage Master Plan provides guidance on City policies to omit detention requirements within the area. Water quality improvements may be included at the City's discretion and would likely be addressed through a regional stormwater quality facility as opposed to a site-specific facility for the WFD corridor.

Any stormwater quality facilities would be designed in accordance with the City's design standards and will be fully evaluated at a later stage in design.



# The Conceptual Design Plan

## III. THE PLAN: DETAILED LAYOUTS

The following section discusses in greater detail the design features and recommendations contained within the 2021 Plan for WFD. It is organized geographically and will examine the corridor segment by segment from west to east.

### Segment A

#### Tualatin River to 16th Street

Segment A runs along WFD from just east of the Tualatin River to the western leg of the WFD and 16th Street intersection. This area is primarily residential with a small zone of general commercial as you approach the downtown portion of West Linn.

The preferred cross-section alternative for Segment A provides two 12-foot travel lanes with a four and a half-foot landscape strip, six-and-a-half-foot one-way cycle track, and six-foot sidewalk on both sides of the roadway.

The preferred cross-section requires less right-of-way and will cost less to construct than other alternatives.

The following updates to this section of the corridor are recommended:

- Sidewalk and separated bike lane construction from the eastern end of the Tualatin River bridge to the newly constructed downtown corridor.
- Intersection safety improvements at all major intersections within Segment A.
- Widen road near Fields Bridge Park to include additional on street parking.

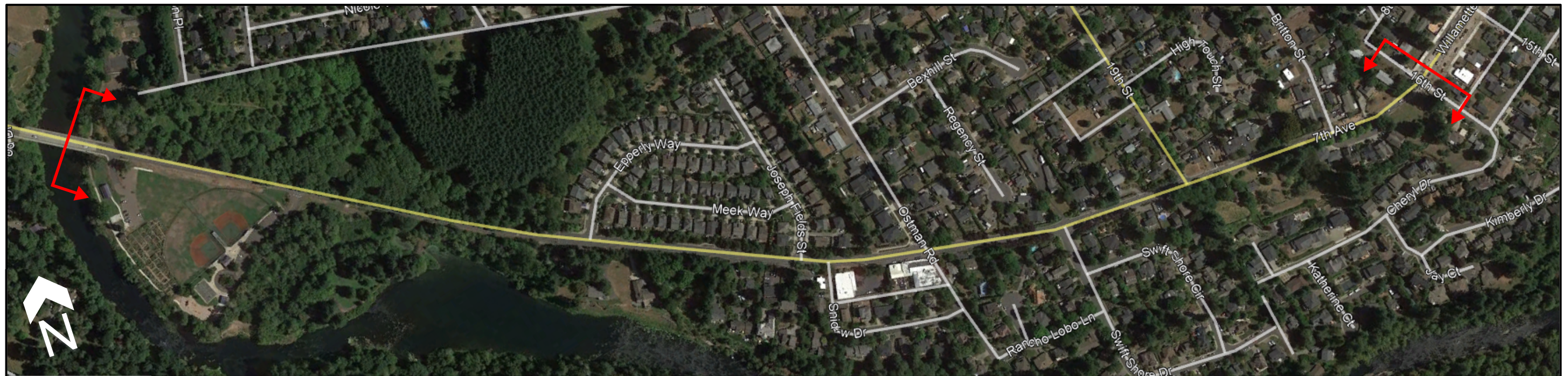


Exhibit 5 - Segment A of 2021 Plan: Stretching from the Tualatin River to 16th Street



# III. The Plan: Detailed Layouts

## Segment B 10<sup>th</sup> Street to 6<sup>th</sup> Street

Segment B runs along WFD from the 10<sup>th</sup> Street intersection (eastern limits of downtown) to the 6<sup>th</sup> Street intersection. Similar to Segment A, Segment B is primarily residential with some general commercial zoning near downtown.

The preferred cross section alternative includes two 13-foot travel lanes with an offset eight-foot multi-use trail. No sidewalk is being proposed along WFD through this segment and cyclists will use the parallel frontage road located immediately south of WFD.

People biking on the frontage road will be accommodated using shared lane pavement marking (sharrows) striped along the full length of the roadway with appropriate signage directing cyclists to this parallel facility. The frontage road has a posted speed of 20 miles per hour and is a comfortable facility for the majority of people biking.

Additional safety features that will be investigated through this segment include a possible additional stop sign at the WFD and 6<sup>th</sup> Street intersection as well as closing an existing frontage road entrance east of the 10<sup>th</sup> Street intersection due to the proximity of a potential new traffic signal or roundabout at WFD and 10<sup>th</sup> Street.

The following updates to this section of the corridor are recommended:

- New shared lane pavement markings to the frontage road parallel to WFD.
- Construction of the remaining portions of the existing shared-use path on the north side of WFD.



Exhibit 6 - Segment B of 2021 Plan: Stretching from 10<sup>th</sup> Street to 6<sup>th</sup> Street



# III. The Plan: Detailed Layouts

## Segment C 6<sup>th</sup> Street to Sunset Avenue

Segment C runs along WFD from 6<sup>th</sup> Street to Sunset Avenue. This segment of WFD is extremely constrained due to the topography on both sides of the roadway and is primarily general industrial.

The preferred cross-section for Segment C includes two 12-foot travel lanes with a 5-foot planter and a 10-foot shared-use path on the south side of the road. All cross-section alternatives require a significant embankment slope on the south side of WFD to accommodate the proposed shared-use path.

The following updates to this section of the corridor are recommended:

- Construction of a shared-use path on the south side of WFD from 6<sup>th</sup> Street to Sunset Avenue.



Exhibit 7 - Segment C of 2021 Plan: Stretching from 6<sup>th</sup> Street to Sunset Avenue



### III. The Plan: Detailed Layouts

#### Segment D

#### Sunset Avenue to West A Street

Segment D runs from Sunset Avenue to the proposed intersection of Sunset Avenue and West A Street. This Segment generally follows the existing Sunset Avenue alignment but does have deviations that will require some significant roadway realignment.

The area along Segment D is currently zoned as general commercial but could undergo a zoning change as part of the ongoing development at the old West Linn Paper Mill.

The preferred cross section provides two 12-foot travel lanes and a 12-foot two-way left-turn lane to facilitate left-turns at the intersections (Sunset Avenue and West A Street). On the northside of the roadway, a 6-foot sidewalk is provided. On the southside, a 5-foot landscape strip, 10-foot two-way cycle track, and 6-foot sidewalk are provided. The preferred segment does not require walls on either side of WFD, however, walls could be used to limit the overall footprint. Due to the proposed alignment changes within this segment, right-of-way acquisition is anticipated, and the road footprint will be optimized to minimize these impacts.

The following updates to this section of the corridor are recommended:

- Construction of full new road section from Sunset Avenue to West A Street including sidewalks and a separated two-way bicycle facility.
- Construction of two new protected intersections.

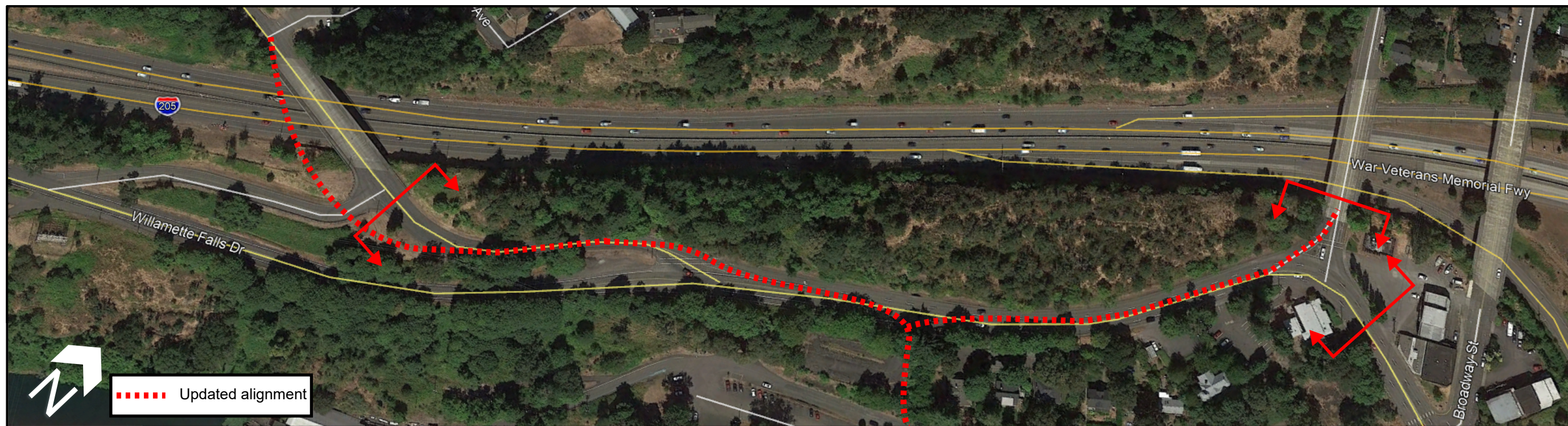


Exhibit 8 - Segment D of 2021 Plan: Stretching from Sunset Avenue to West A Street



### III. The Plan: Detailed Layouts

#### Segment E West A Street to I-205

Segment E runs from West A Street to the interchange of OR 43 and I-205. This stretch of roadway will be on a completely new alignment and is subject to change as development in the area becomes more detailed.

Segment E is also currently designated as general commercial, but like Segment D, it could undergo a rezoning effort as part of the ongoing redevelopment of the Mill Site.

The preferred cross section includes two 12-foot travel lanes, two 8-foot on-street parking lanes, a northern sidewalk, a 10-foot two-way separated bicycle lane, and a southern sidewalk through Segment E. This cross section is also subject to change.

This area includes an I-205 interchange and is subject to further review and refinement. Additional plan details for this area will need to be developed in future design stages of this project.

The following updates to this section of the corridor are recommended:

- Construction of full new road section from West A Street to I-205 including sidewalks and a separated two-way bicycle facility.
- Construction of a new multi-leg roundabout at the WFD/Sunset/OR43/I-205 intersection.

#### Detailed Concept Design Plans

Figures 1 through 29 illustrate the concept design plans for the entire WFD corridor.

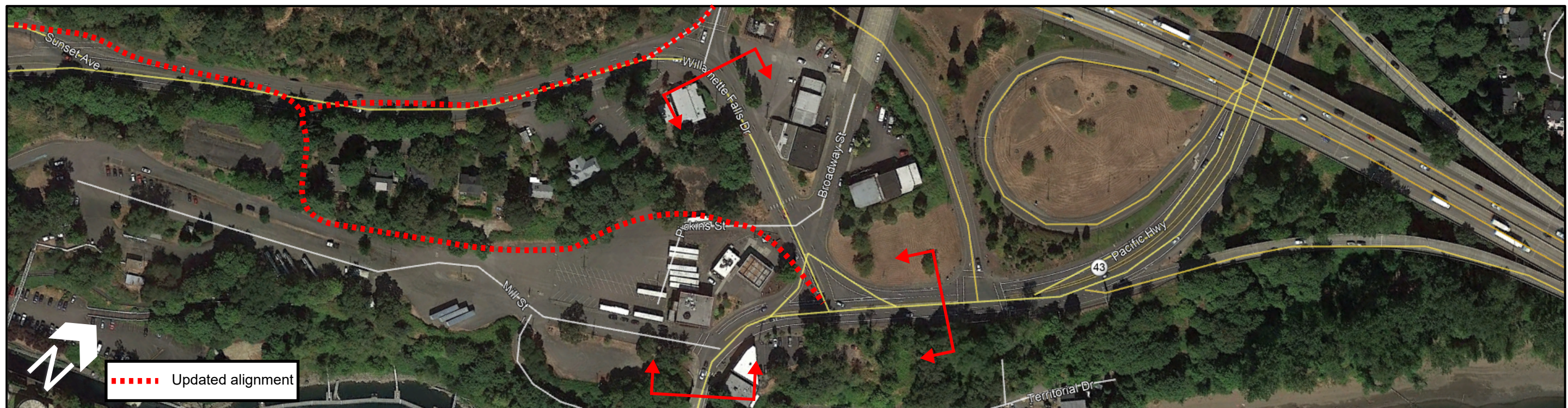
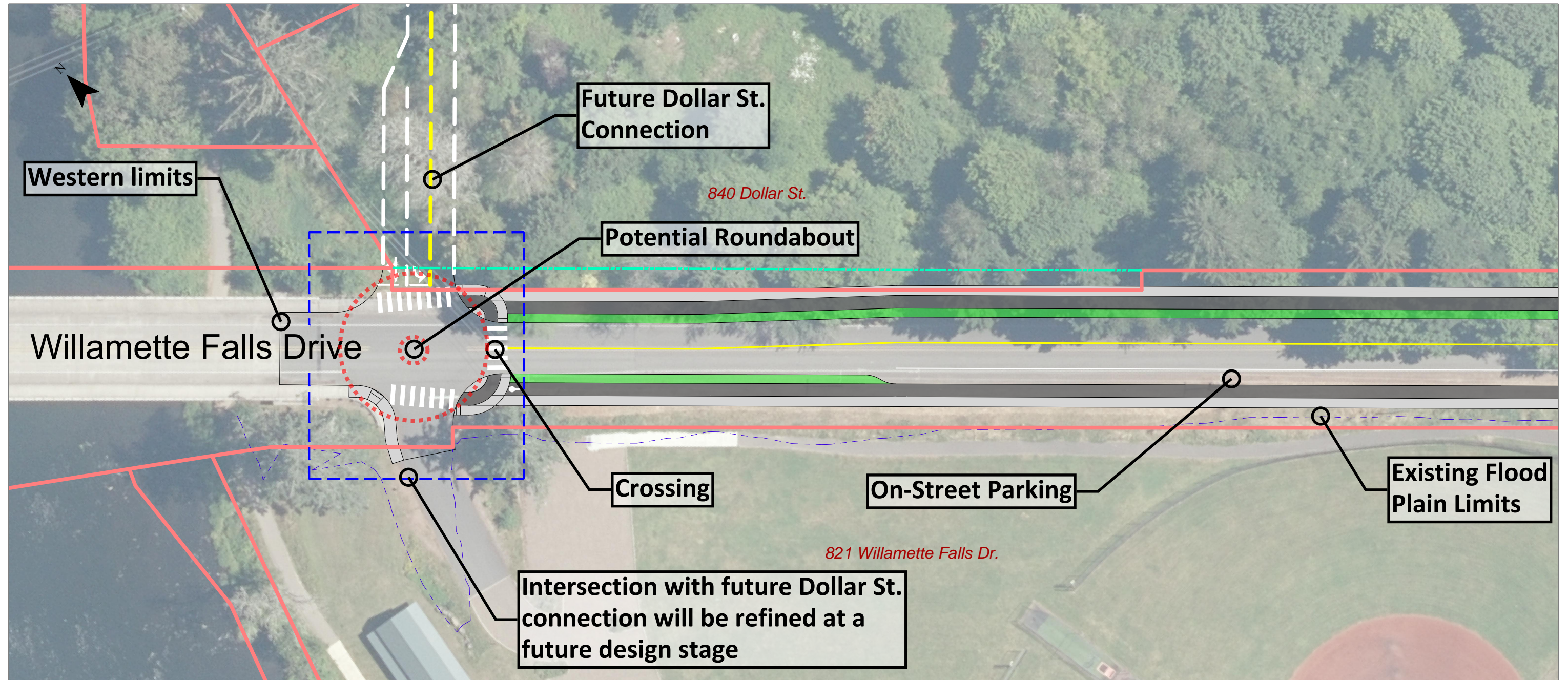








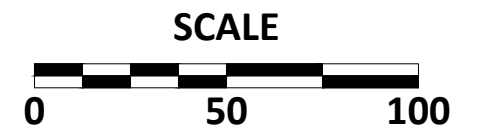
Exhibit 9 - Segment E of 2021 Plan: Stretching from West A Street to I-205





Aerial imagery provided by City of West Linn GIS

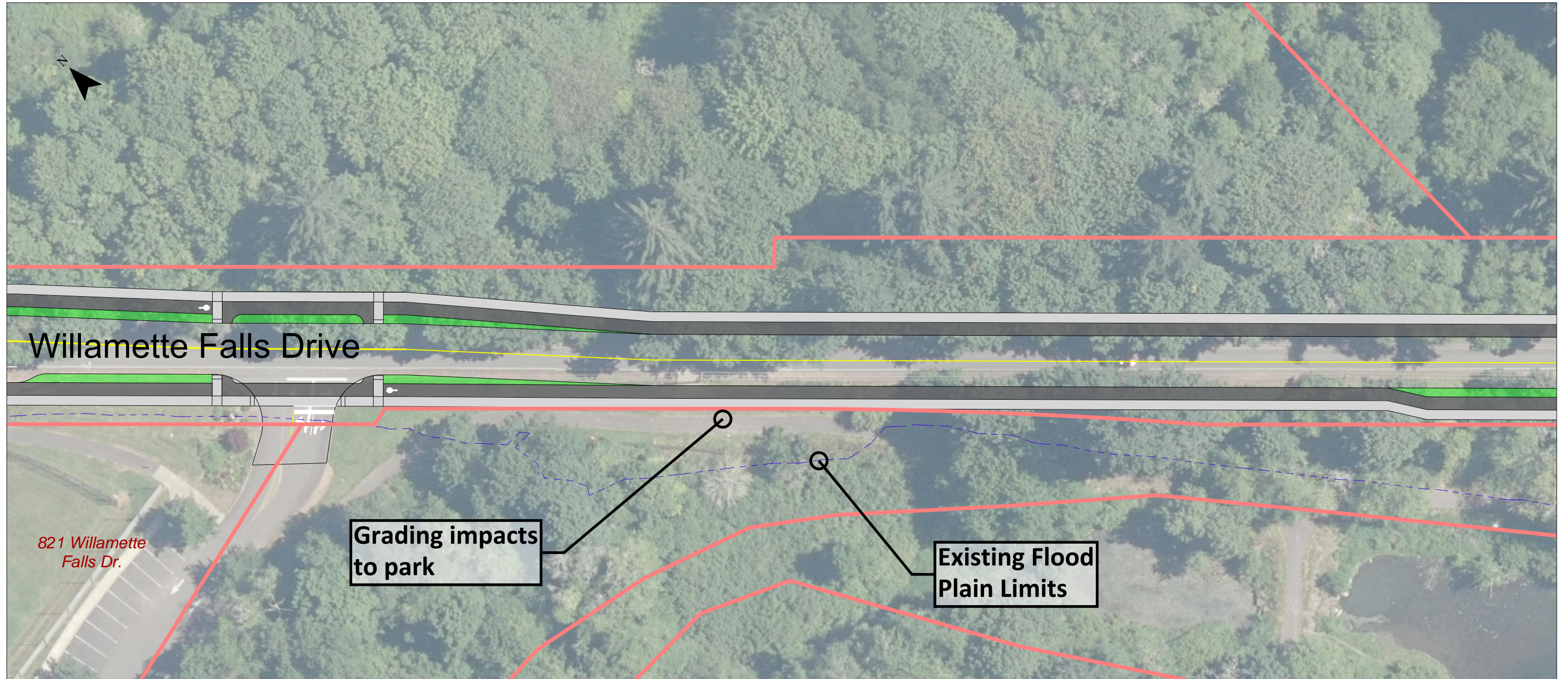
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

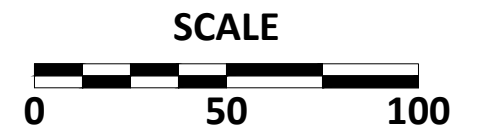
West Linn, Oregon | Figure 1





Aerial imagery provided by City of West Linn GIS

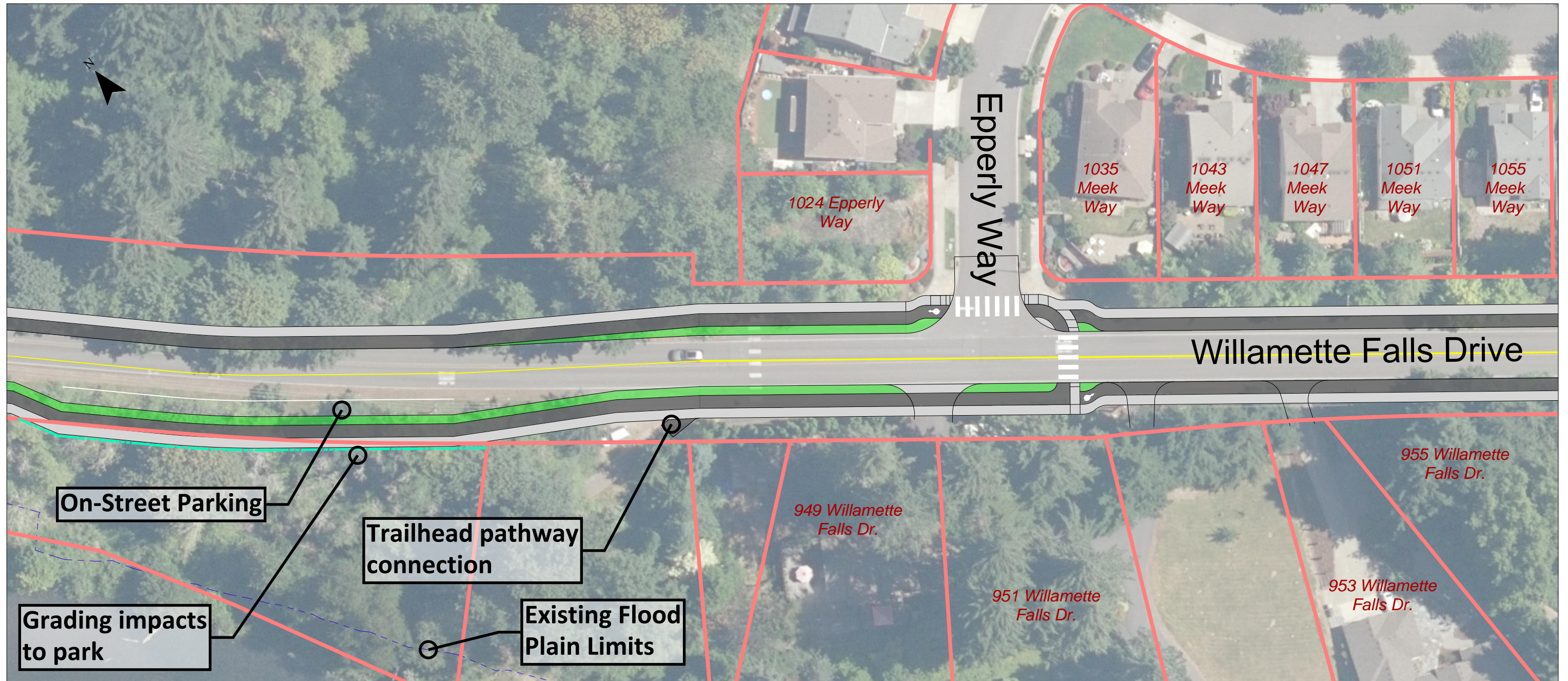
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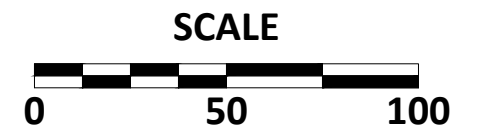
West Linn, Oregon | **Figure 2**





Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**

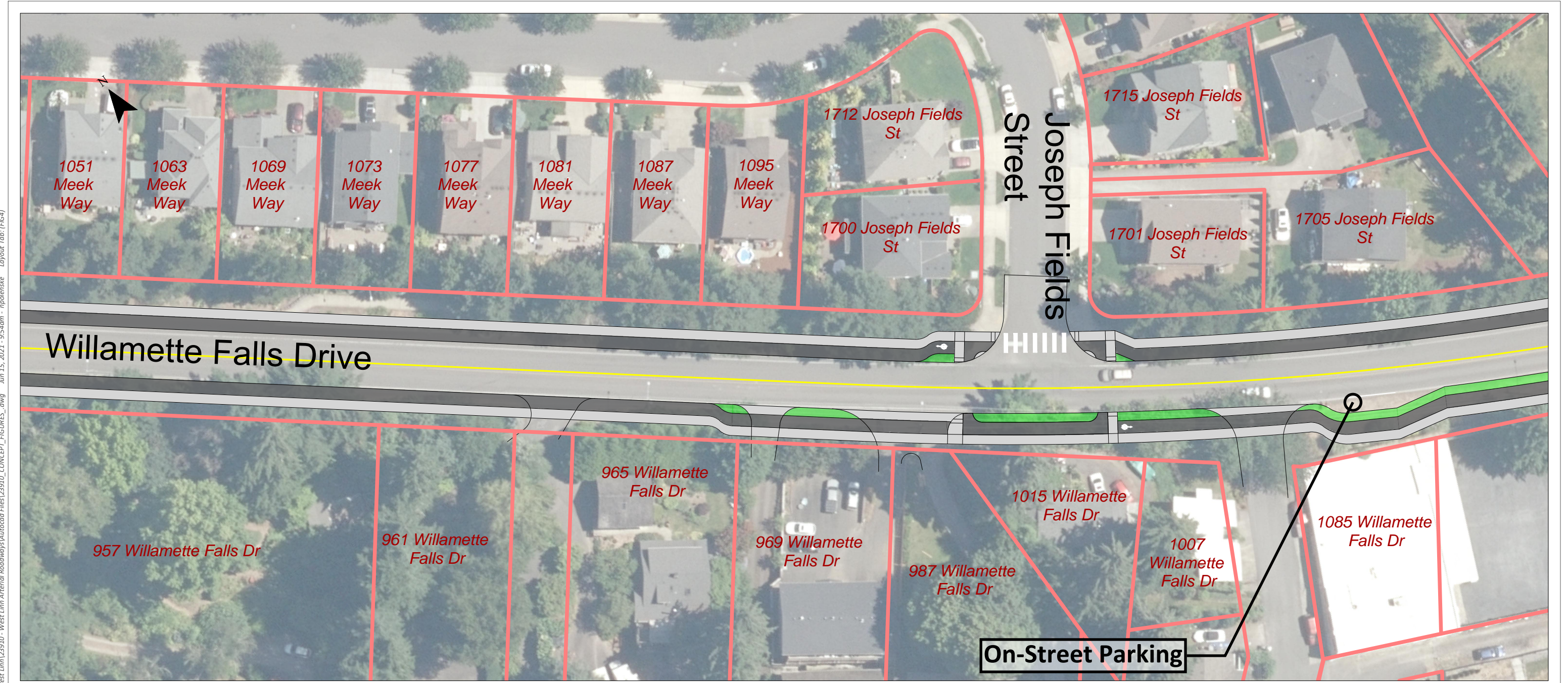


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.







West Linn, Oregon **Figure 3**

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Aerial imagery provided by City of West Linn GIS

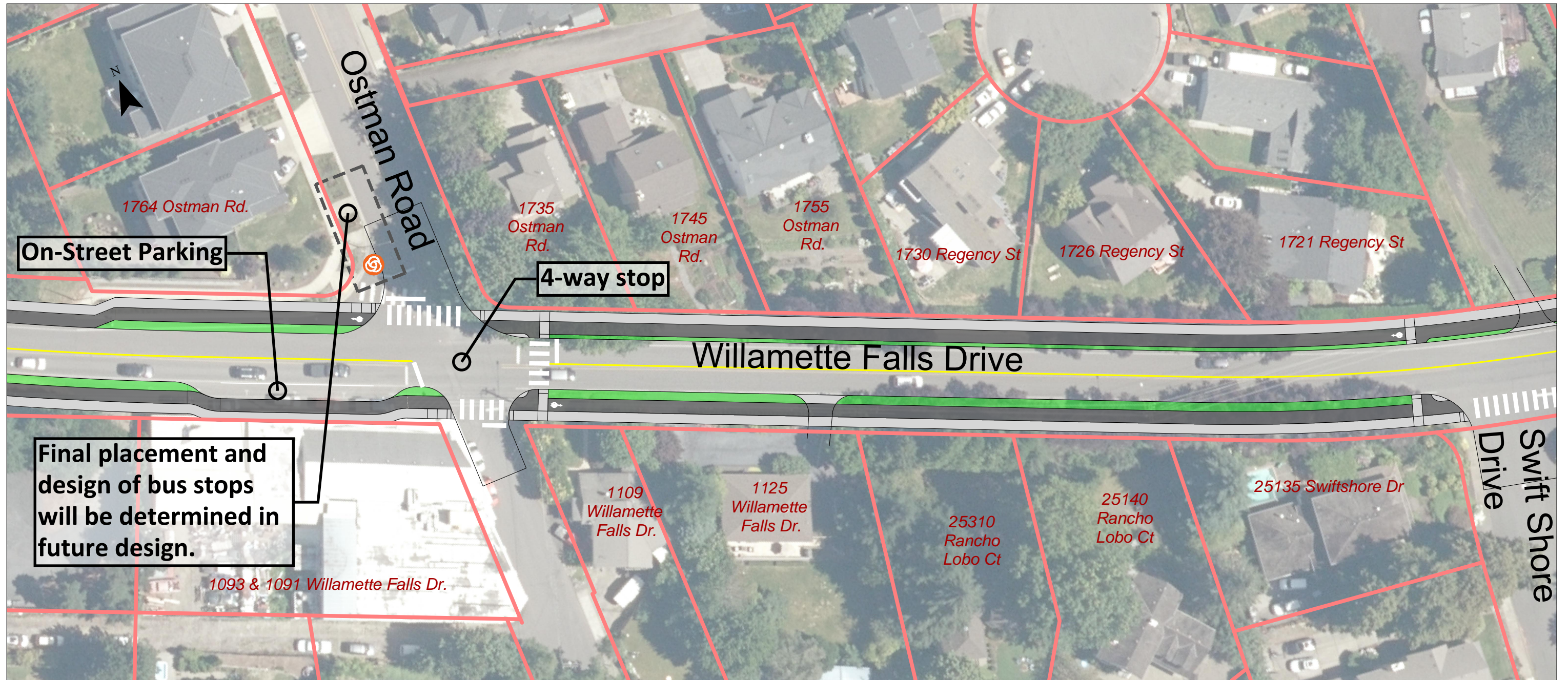
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>

<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.







<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

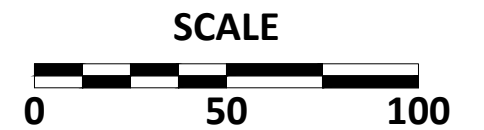
West Linn, Oregon **Figure 4**





Aerial imagery provided by City of West Linn GIS

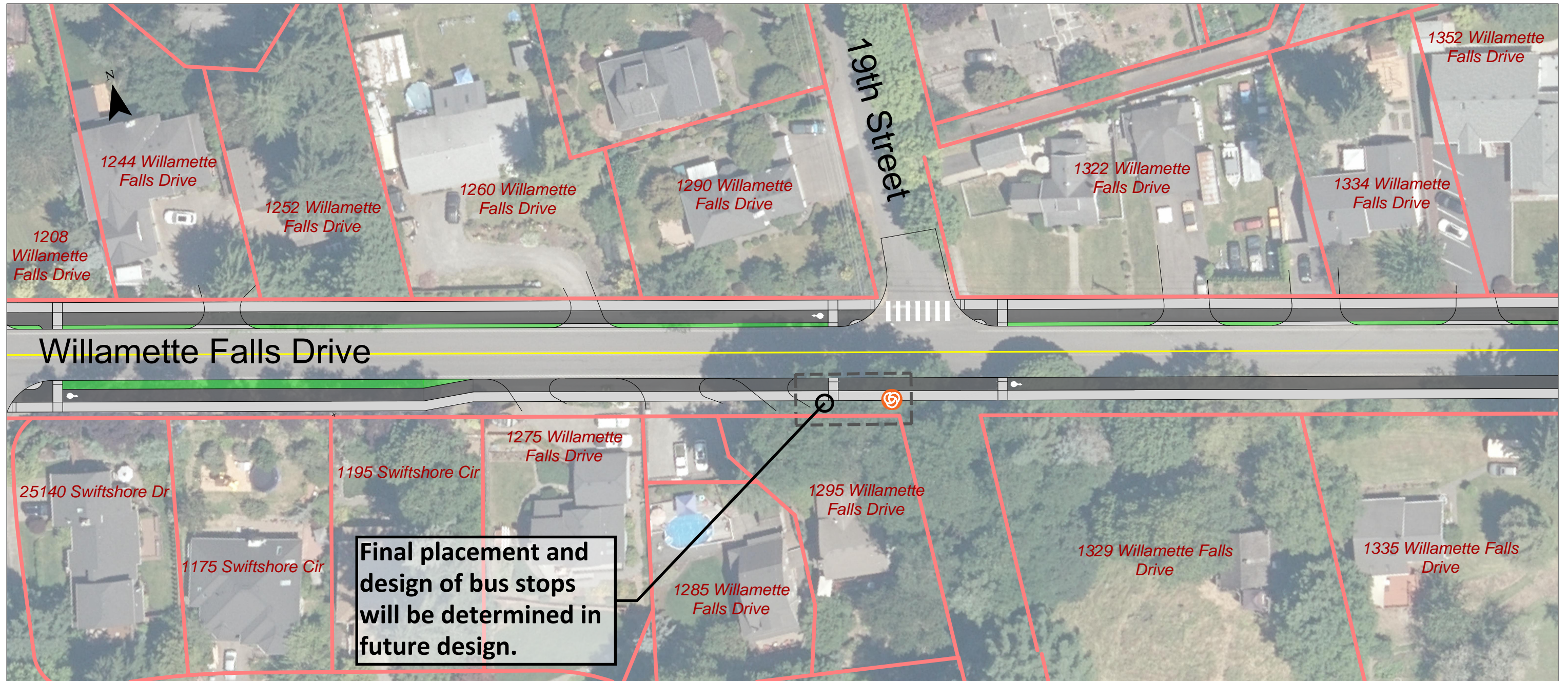
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

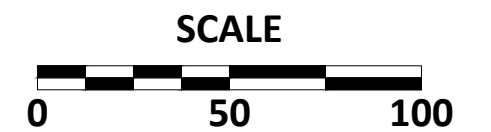
West Linn, Oregon **Figure 5**





Aerial imagery provided by City of West Linn GIS

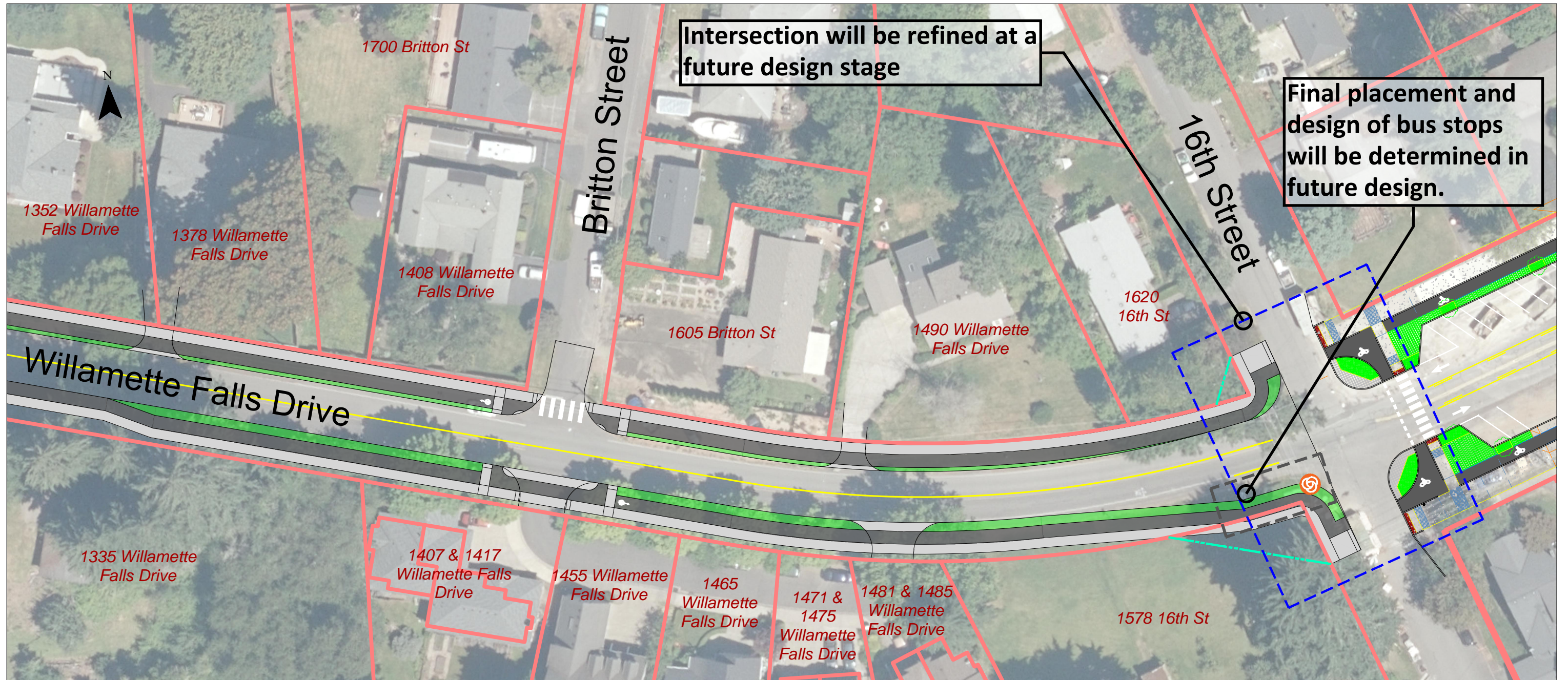
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

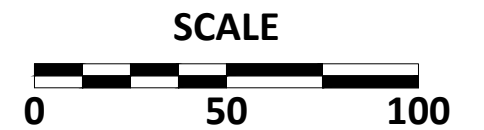
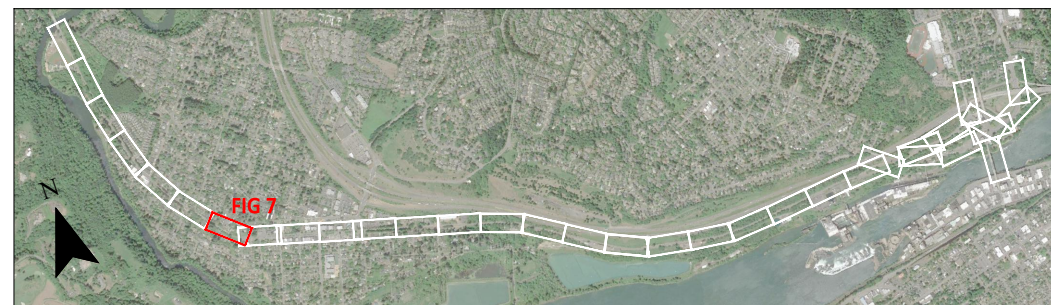
West Linn, Oregon | Figure 6





Aerial imagery provided by City of West Linn GIS

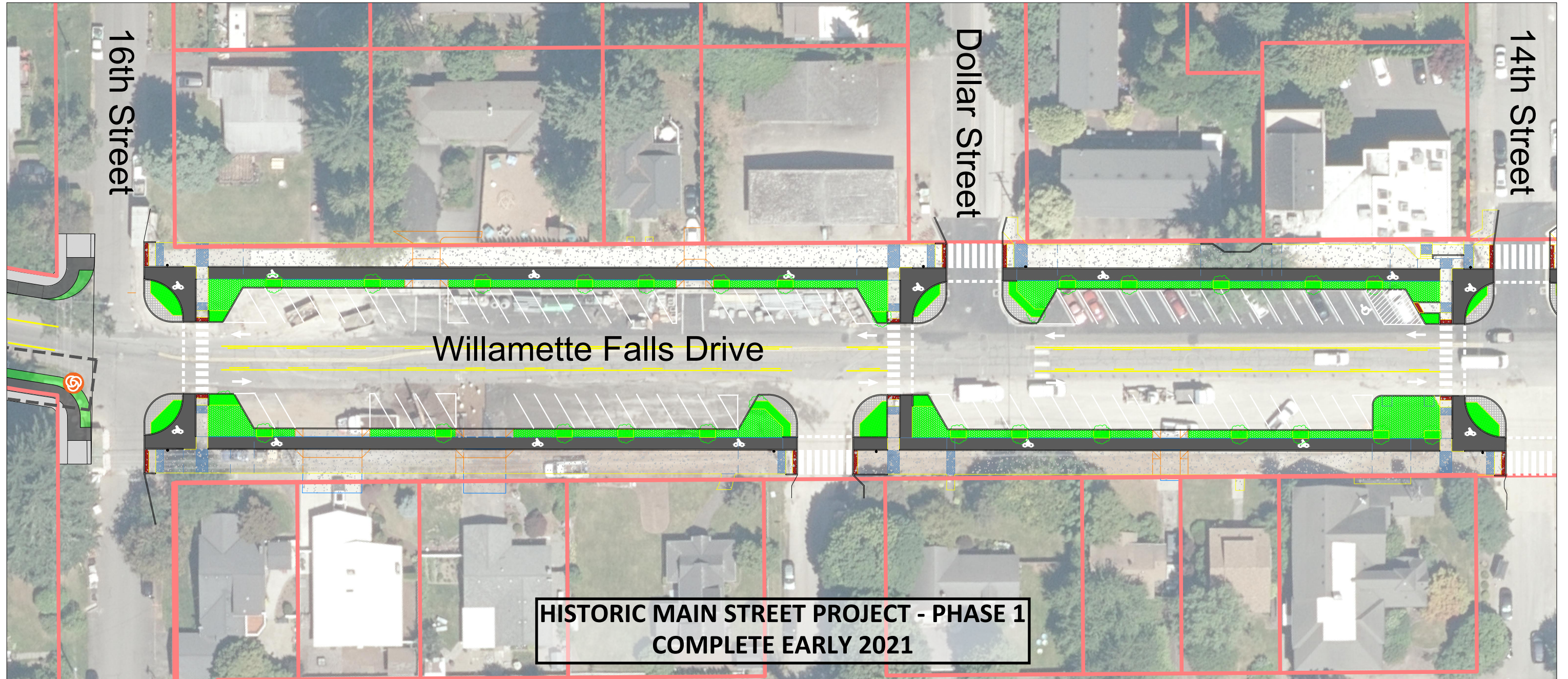
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

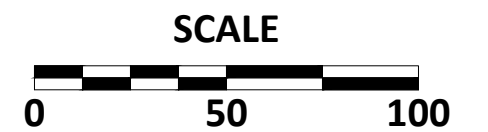
West Linn, Oregon **Figure 7**





Aerial imagery provided by City of West Linn GIS

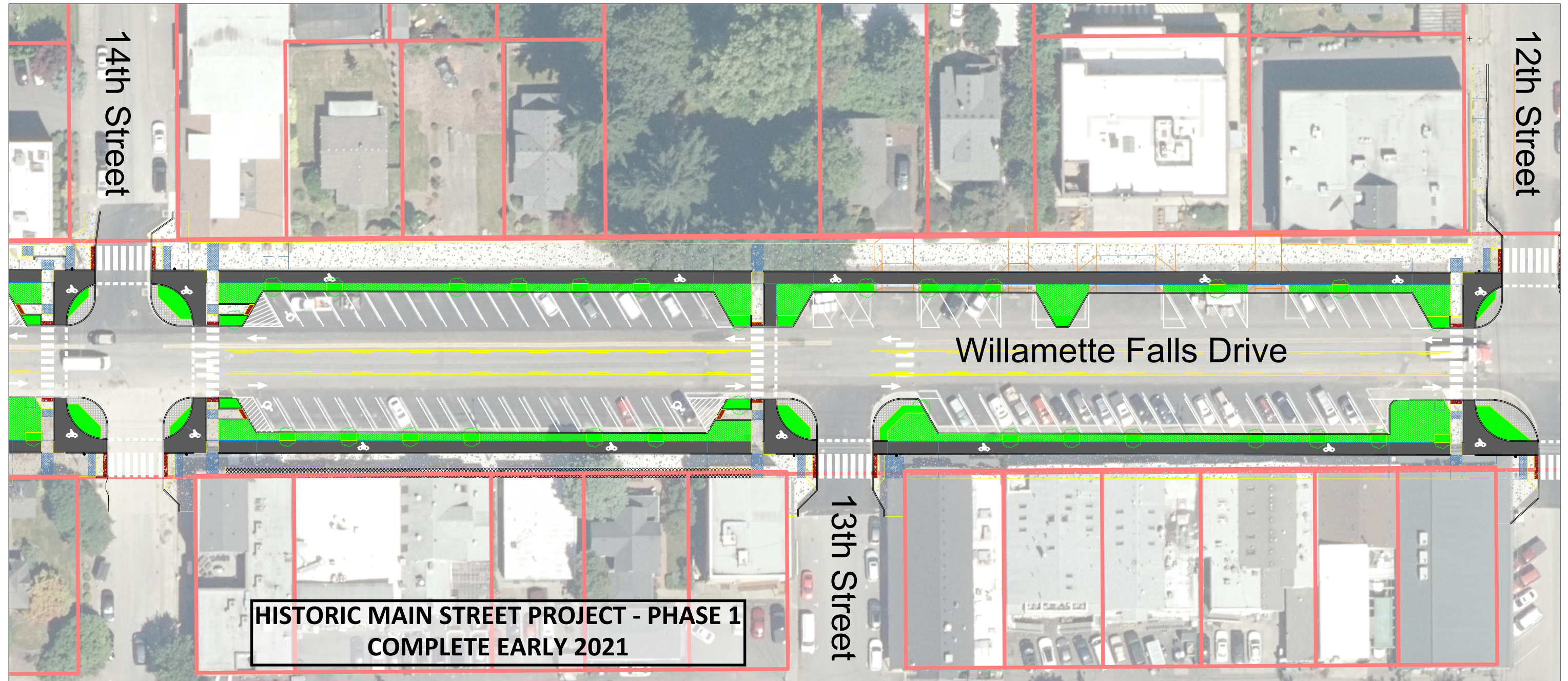
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

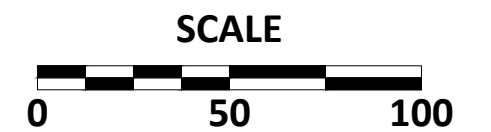
West Linn, Oregon **Figure 7a**





Aerial imagery provided by City of West Linn GIS

- Sidewalk
- Protected Bike Facility
- Buffer/Landscape
- TriMet Bus Stop Location<sup>1</sup>
- Intersection to be refined at later design stage
- Potential Right-of-way Impacts<sup>2</sup>

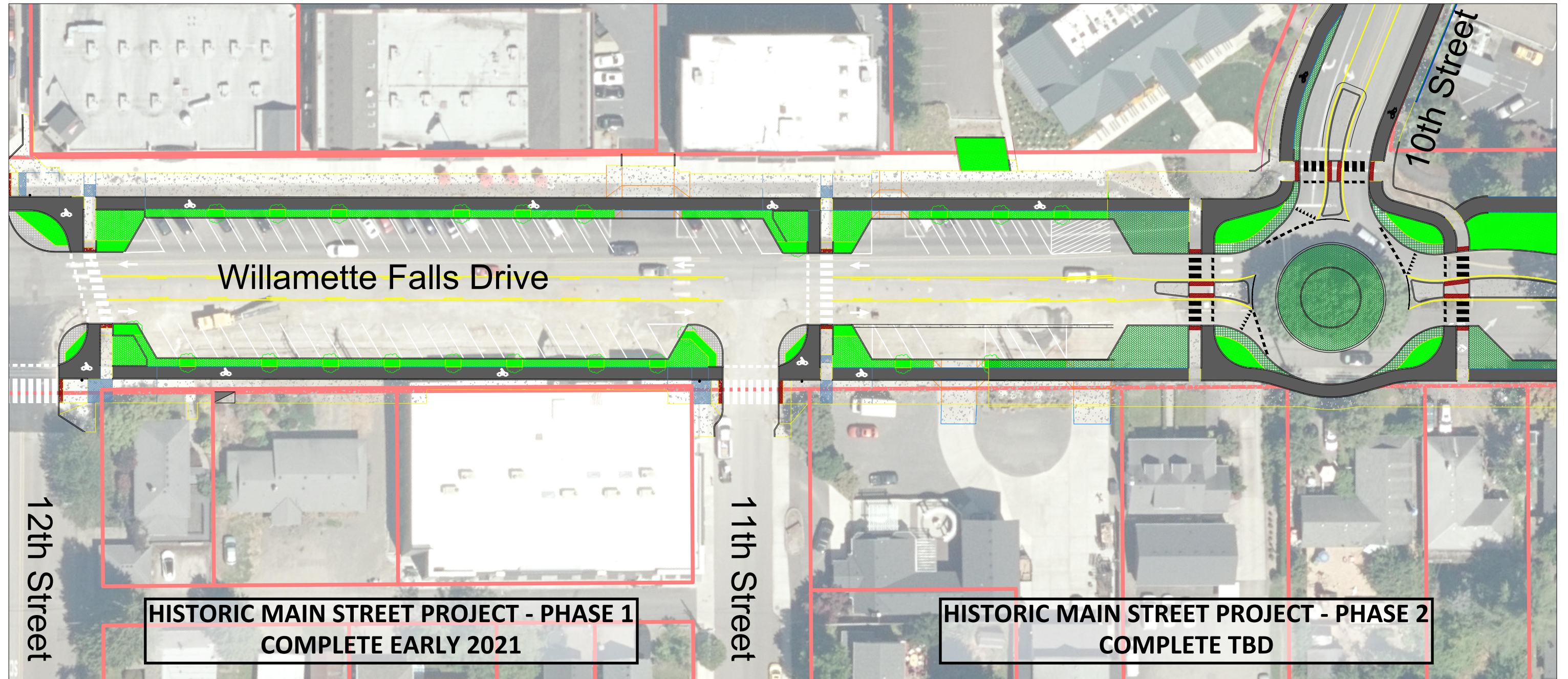


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon **Figure 7b**

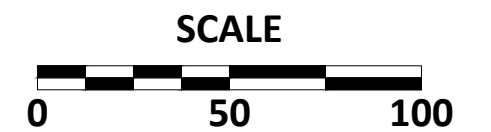
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Aerial imagery provided by City of West Linn GIS

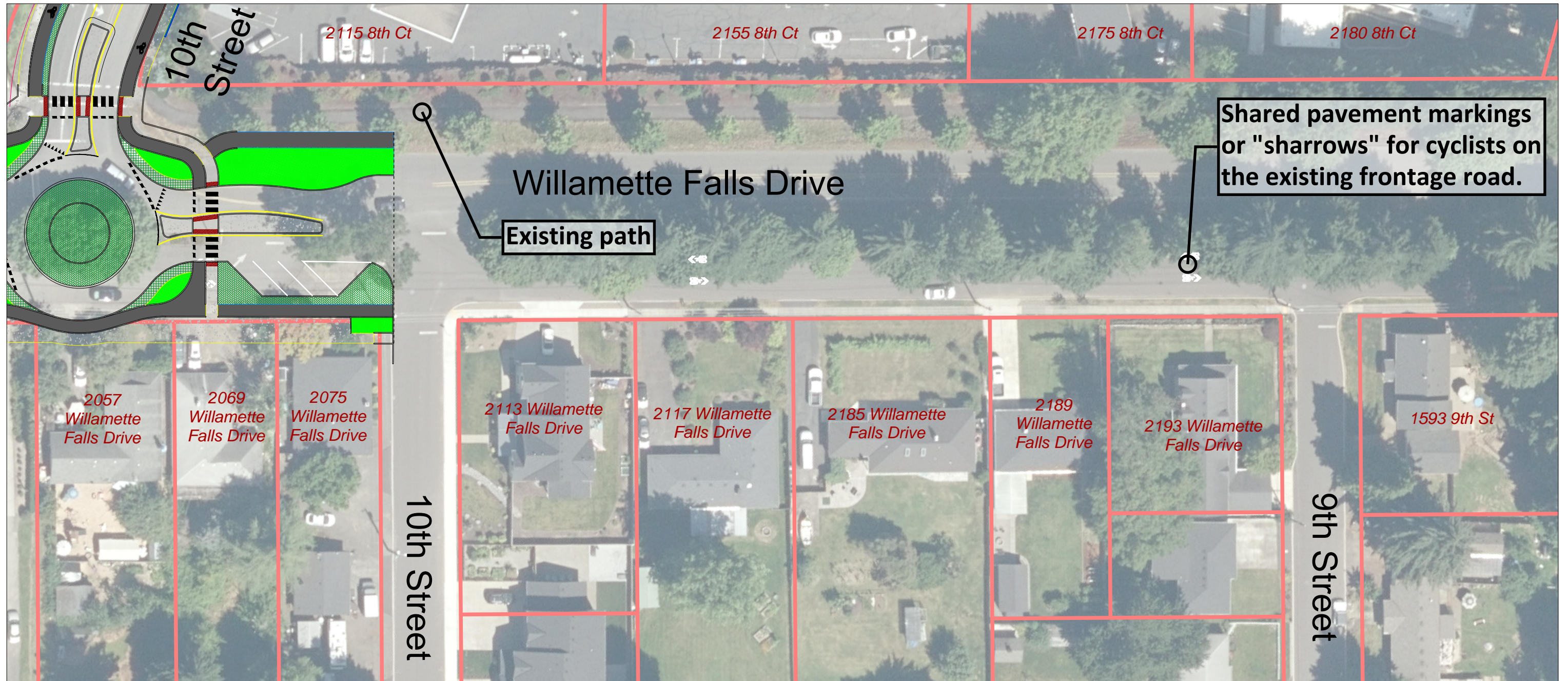
- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon **Figure 7c**









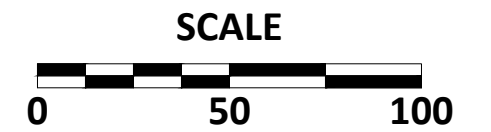


Shared pavement markings or "sharrows" for cyclists on the existing frontage road.

Existing path

Aerial imagery provided by City of West Linn GIS

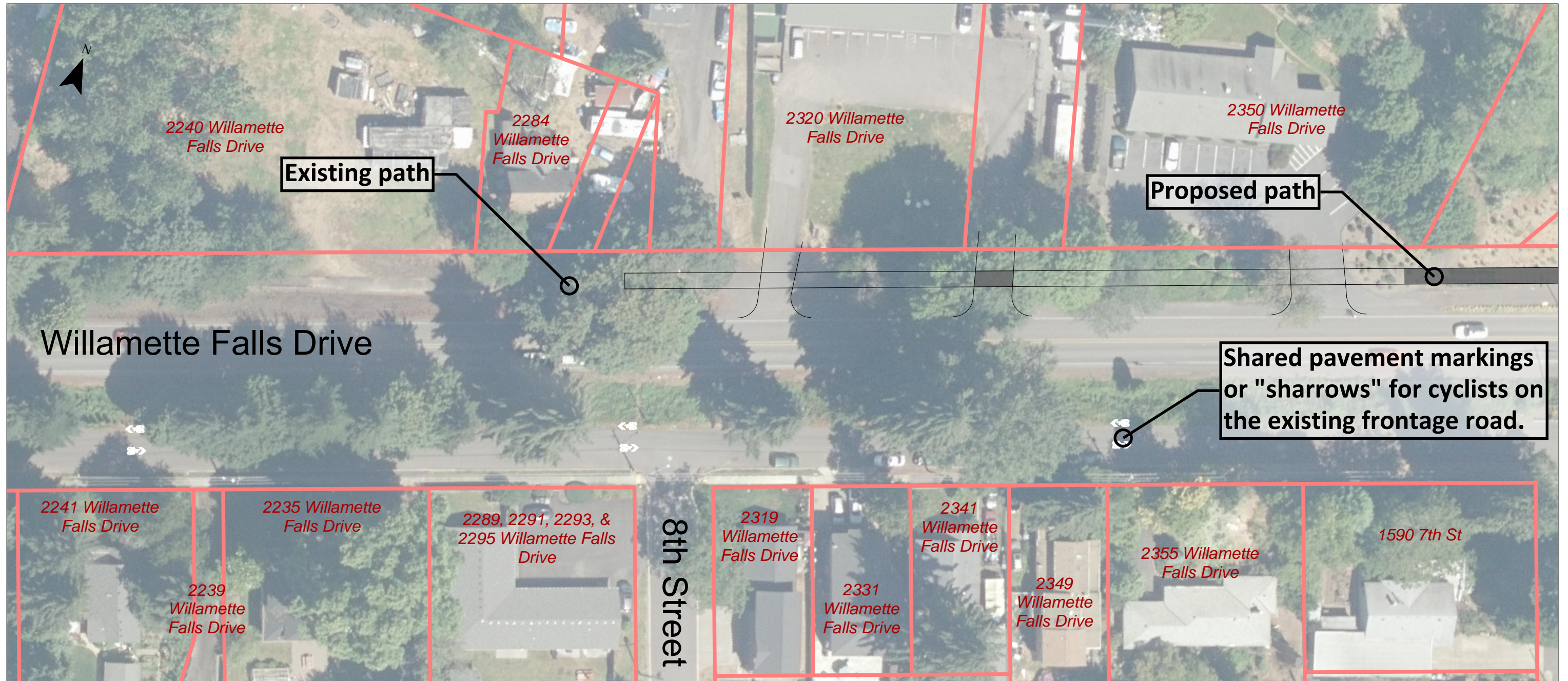
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

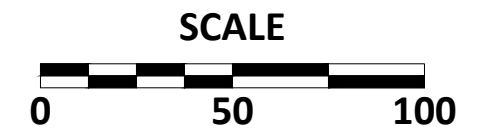
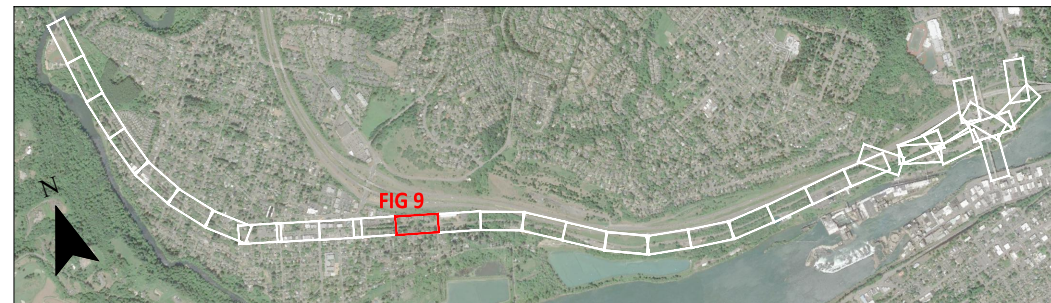
West Linn, Oregon **Figure 8**





Aerial imagery provided by City of West Linn GIS

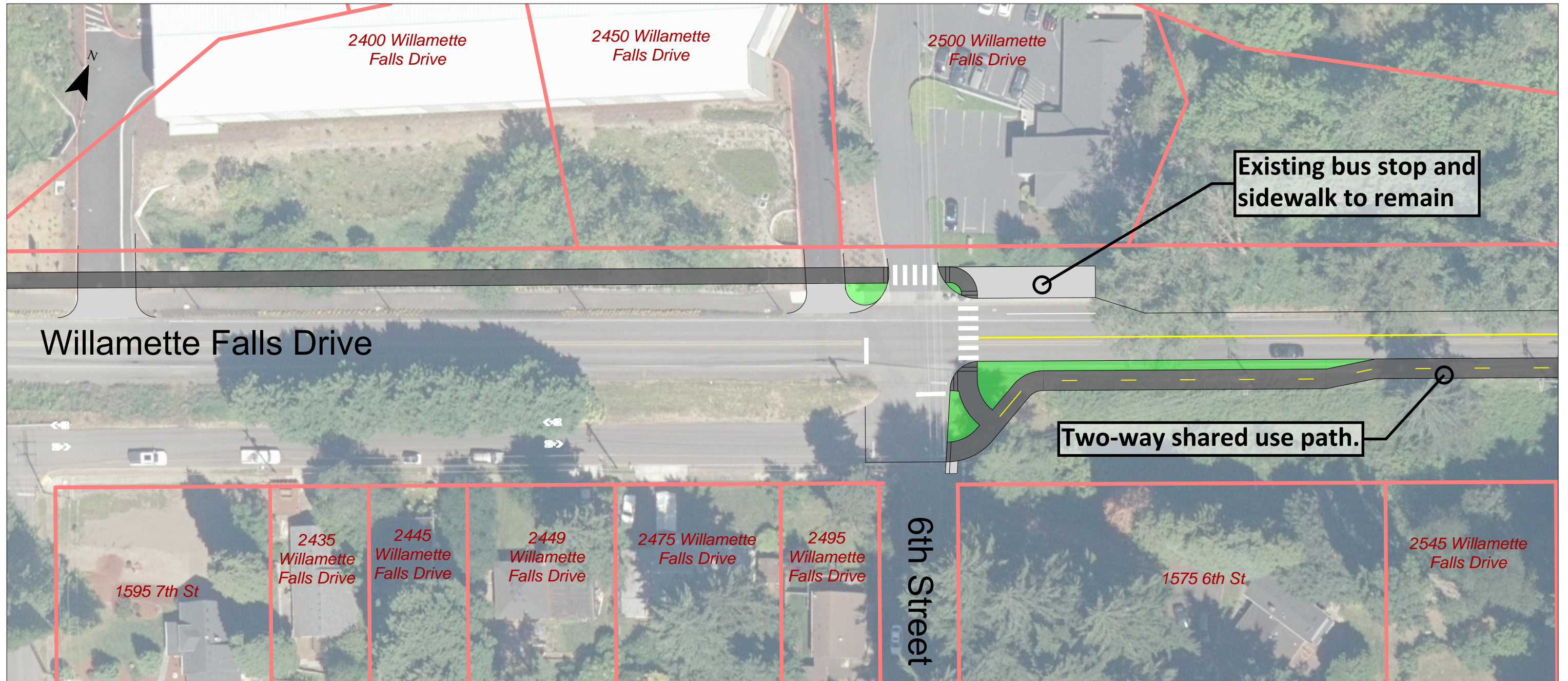
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

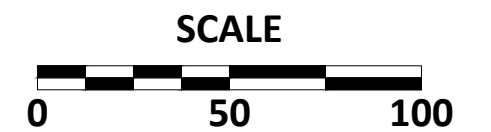
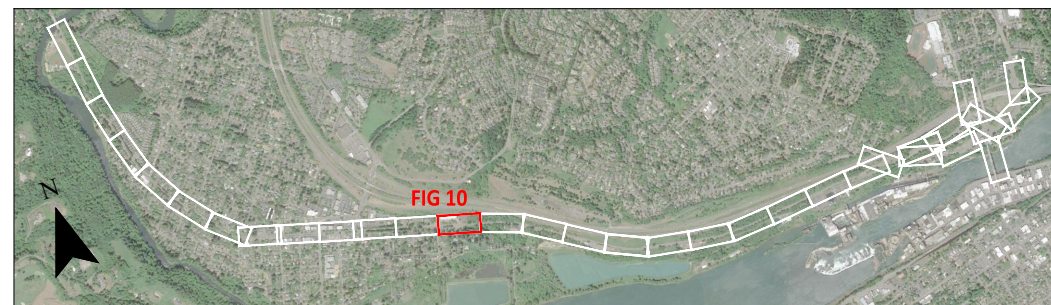
West Linn, Oregon | Figure 9





Aerial imagery provided by City of West Linn GIS

-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>

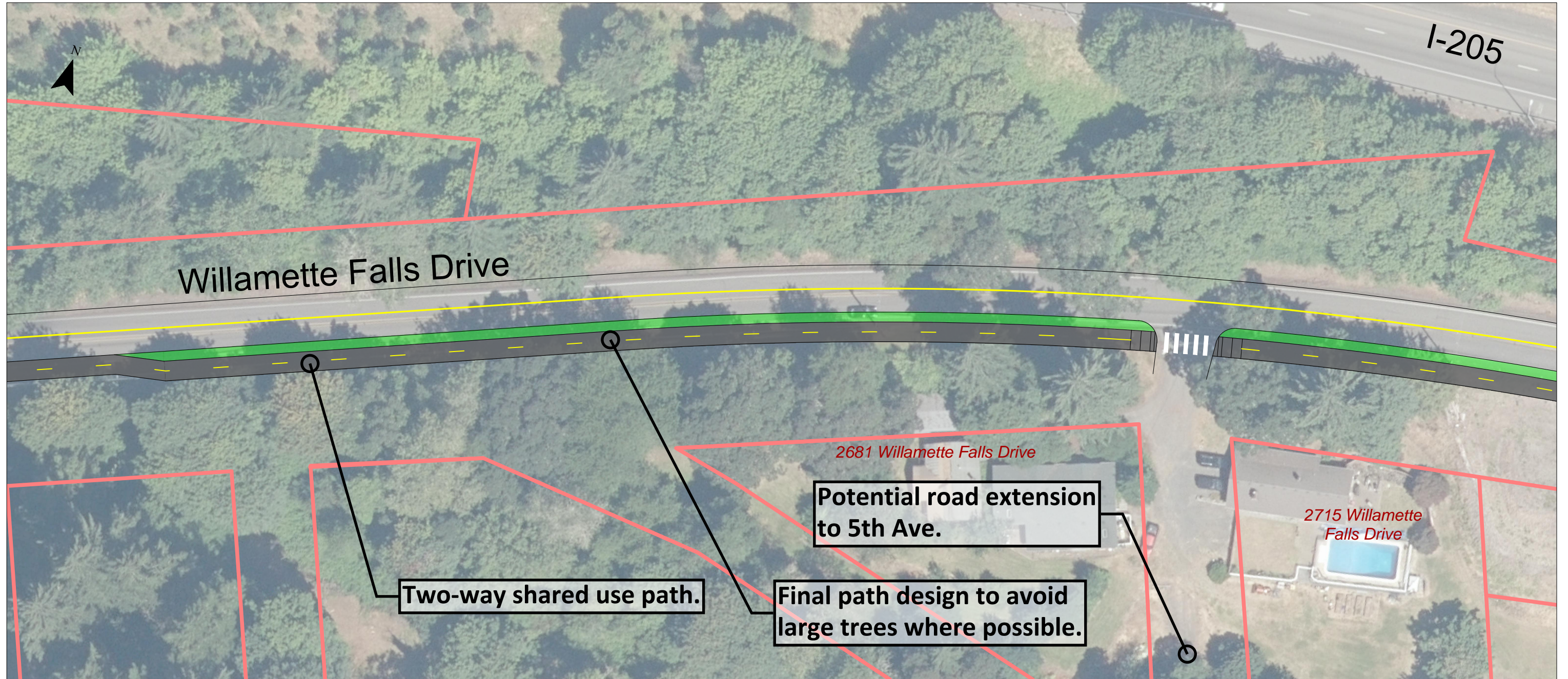


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.







<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

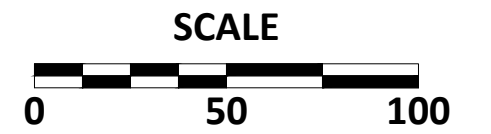
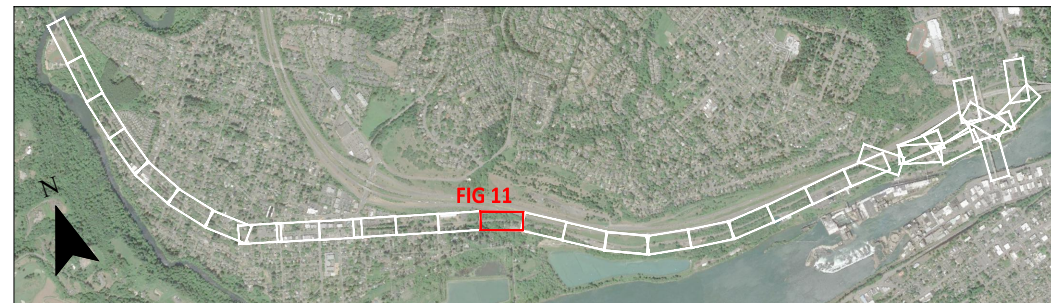
West Linn, Oregon | Figure 10





Aerial imagery provided by City of West Linn GIS

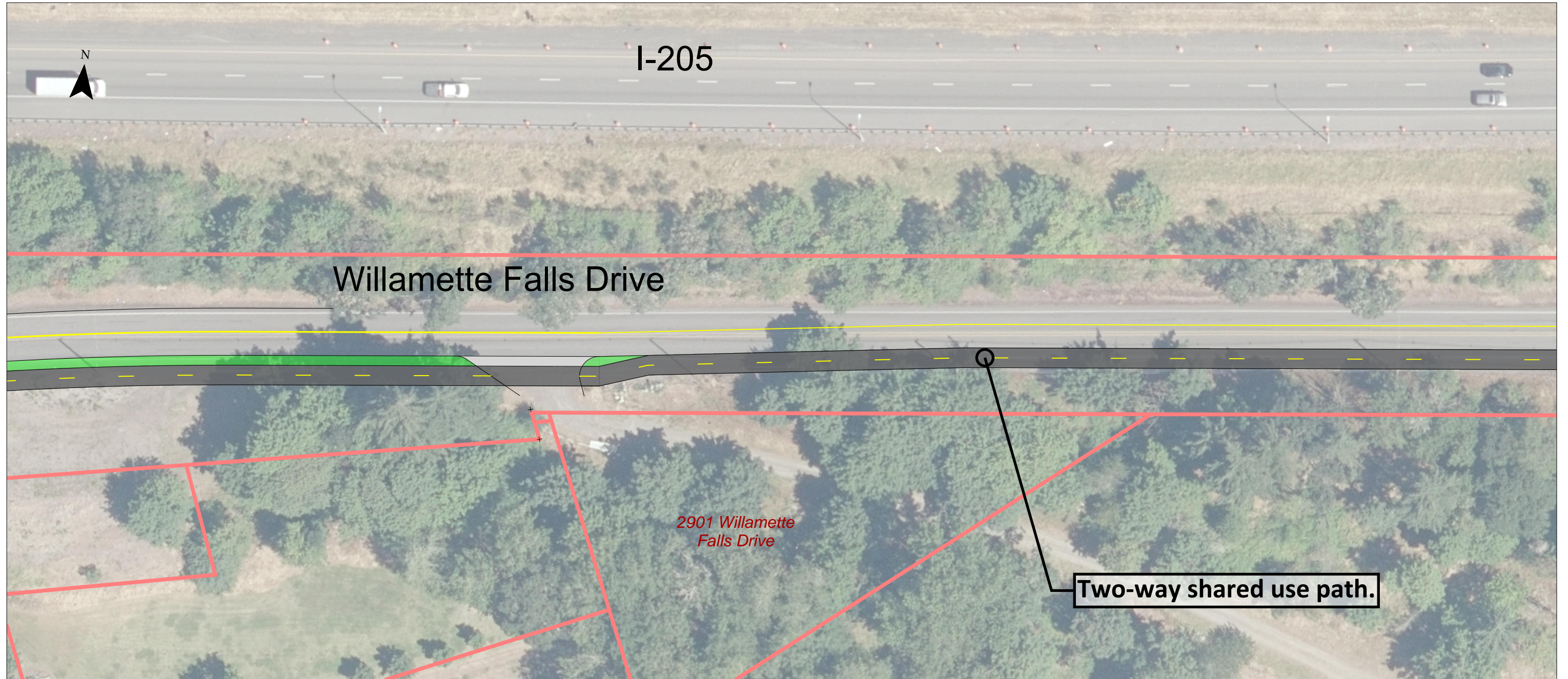
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

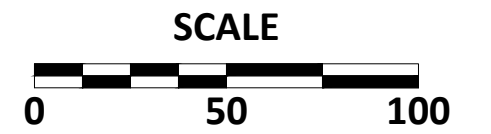
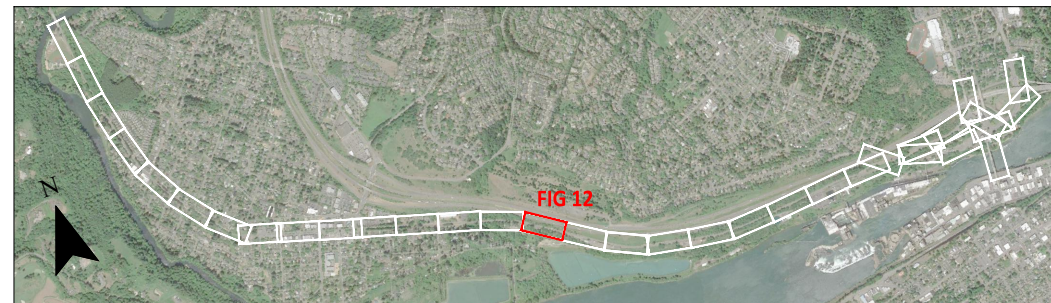
West Linn, Oregon | Figure 11





Aerial imagery provided by City of West Linn GIS

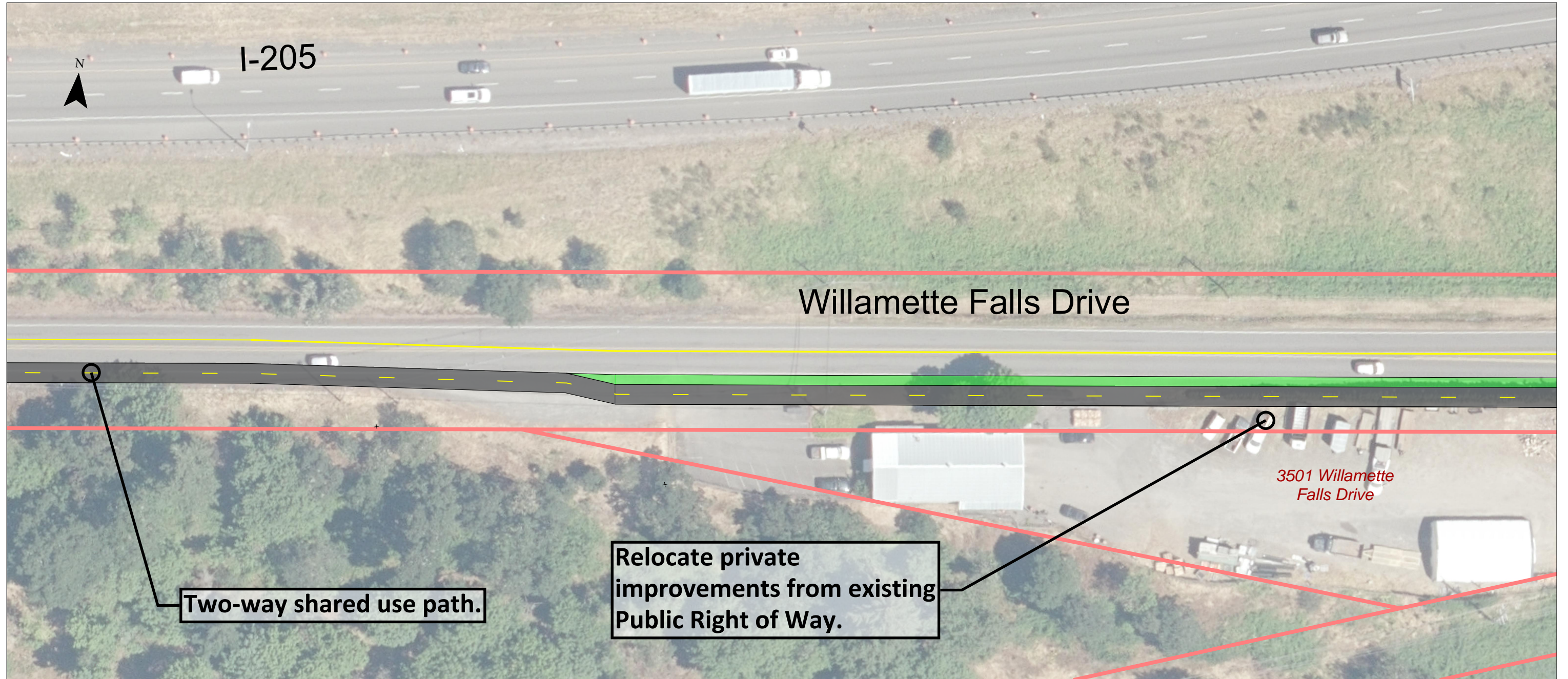
-  **Sidewalk**
-  **Protected Bike Facility**
-  **Buffer/Landscape**
-  **TriMet Bus Stop Location<sup>1</sup>**
-  **Intersection to be refined at later design stage**
-  **Potential Right-of-way Impacts<sup>2</sup>**









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

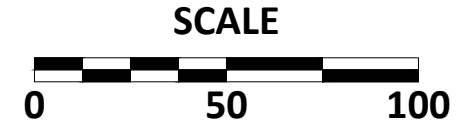
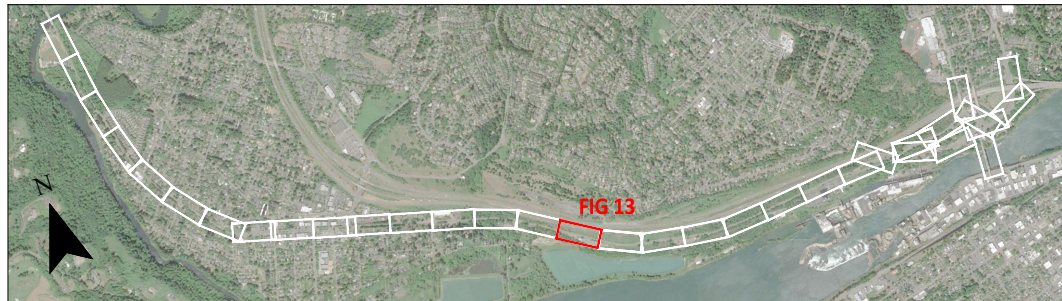
West Linn, Oregon | **Figure 12**





Aerial imagery provided by City of West Linn GIS

-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.







West Linn, Oregon | Figure 13

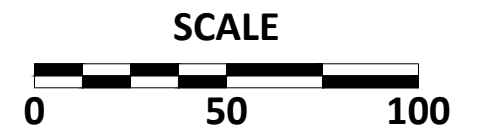


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Aerial imagery provided by City of West Linn GIS

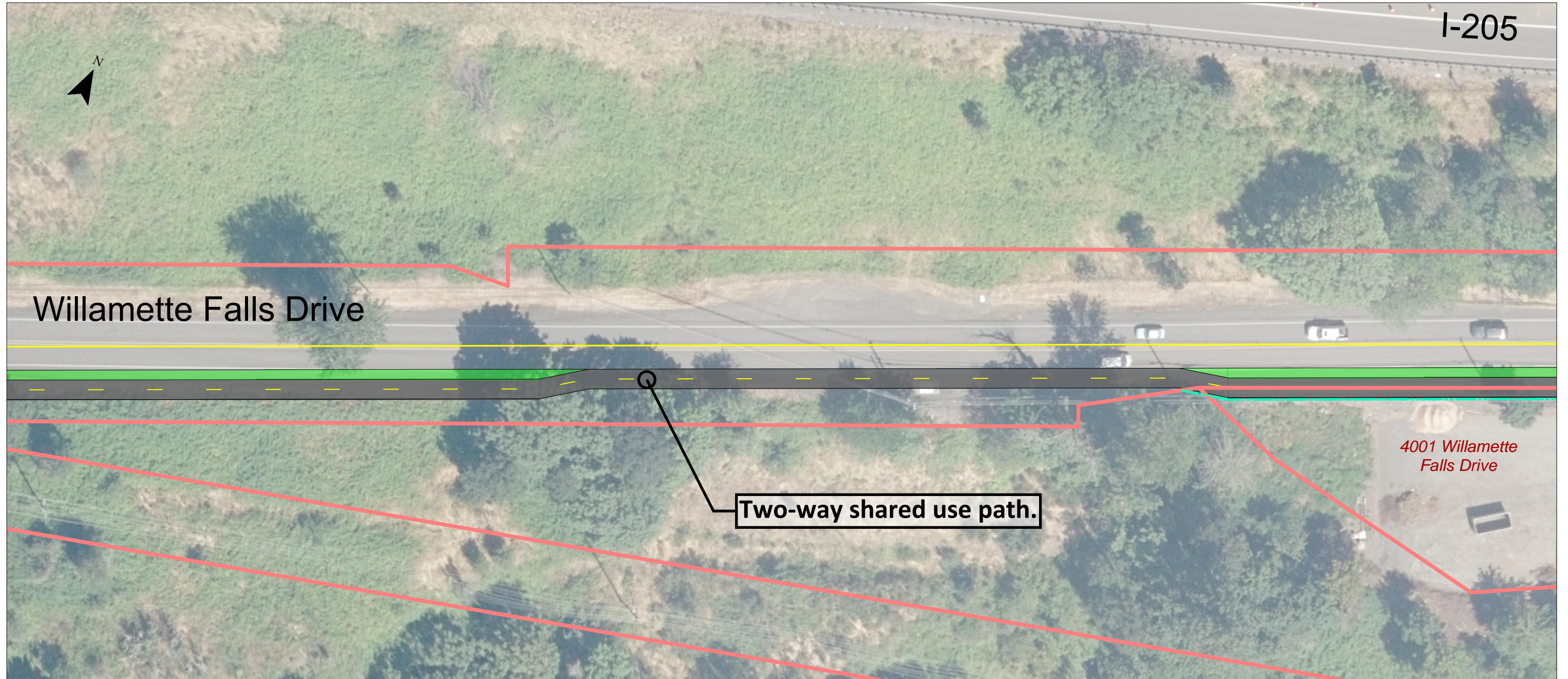
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

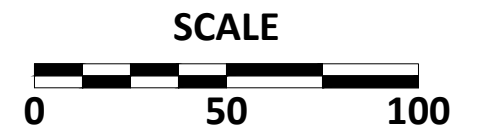
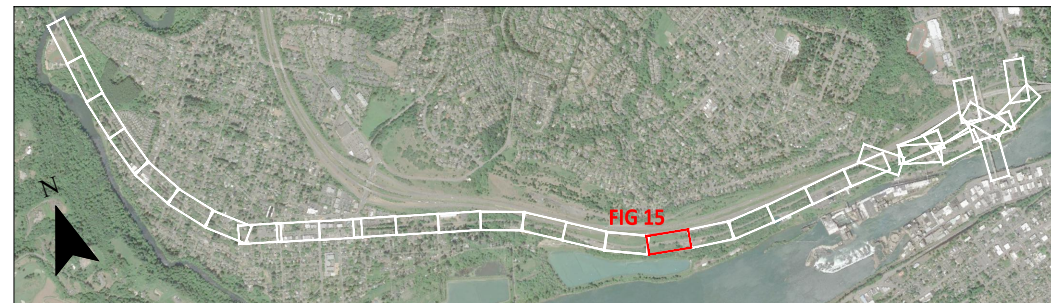
West Linn, Oregon | Figure 14





Aerial imagery provided by City of West Linn GIS

-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>



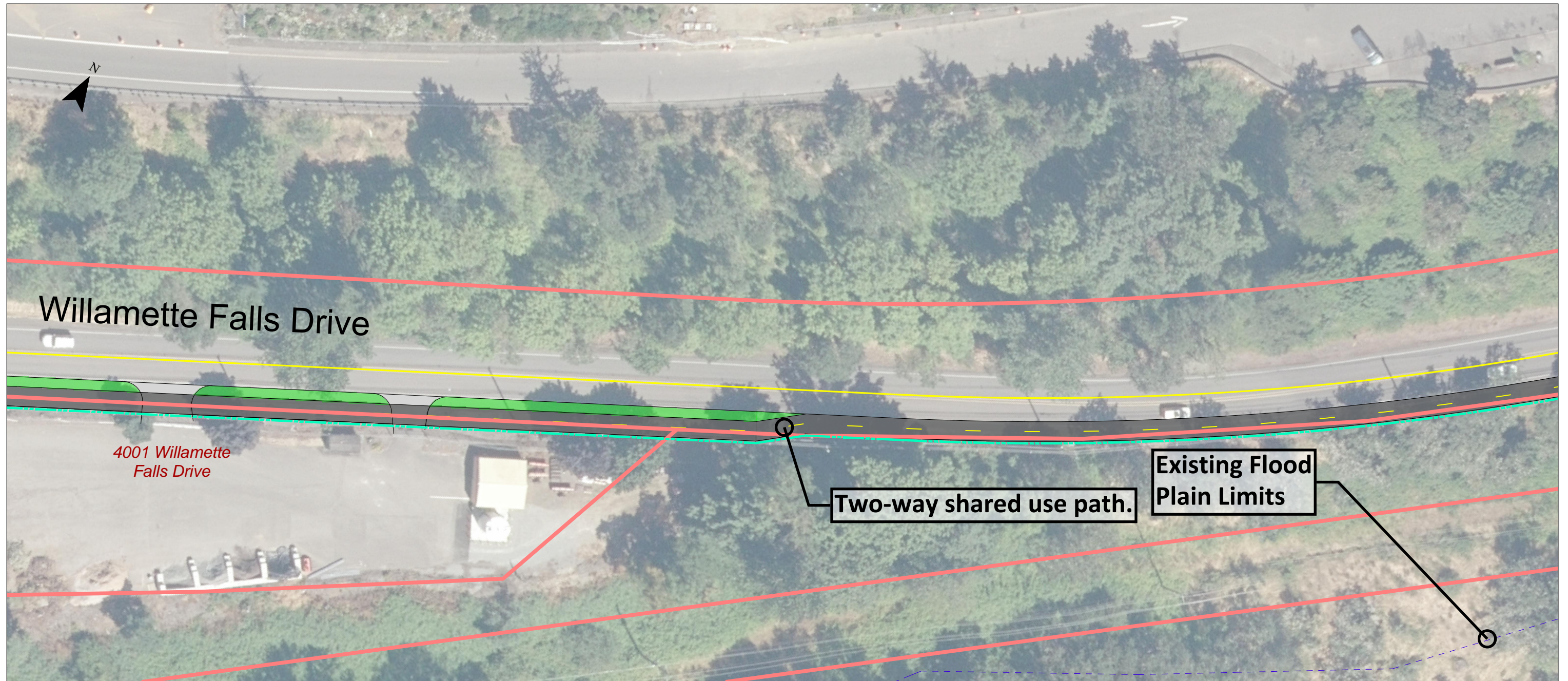
<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon | Figure 15

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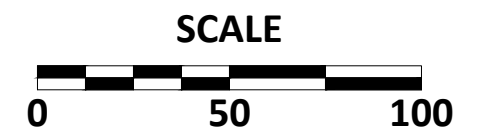


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Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

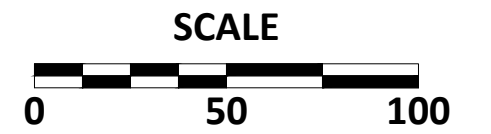
West Linn, Oregon | **Figure 16**





Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**

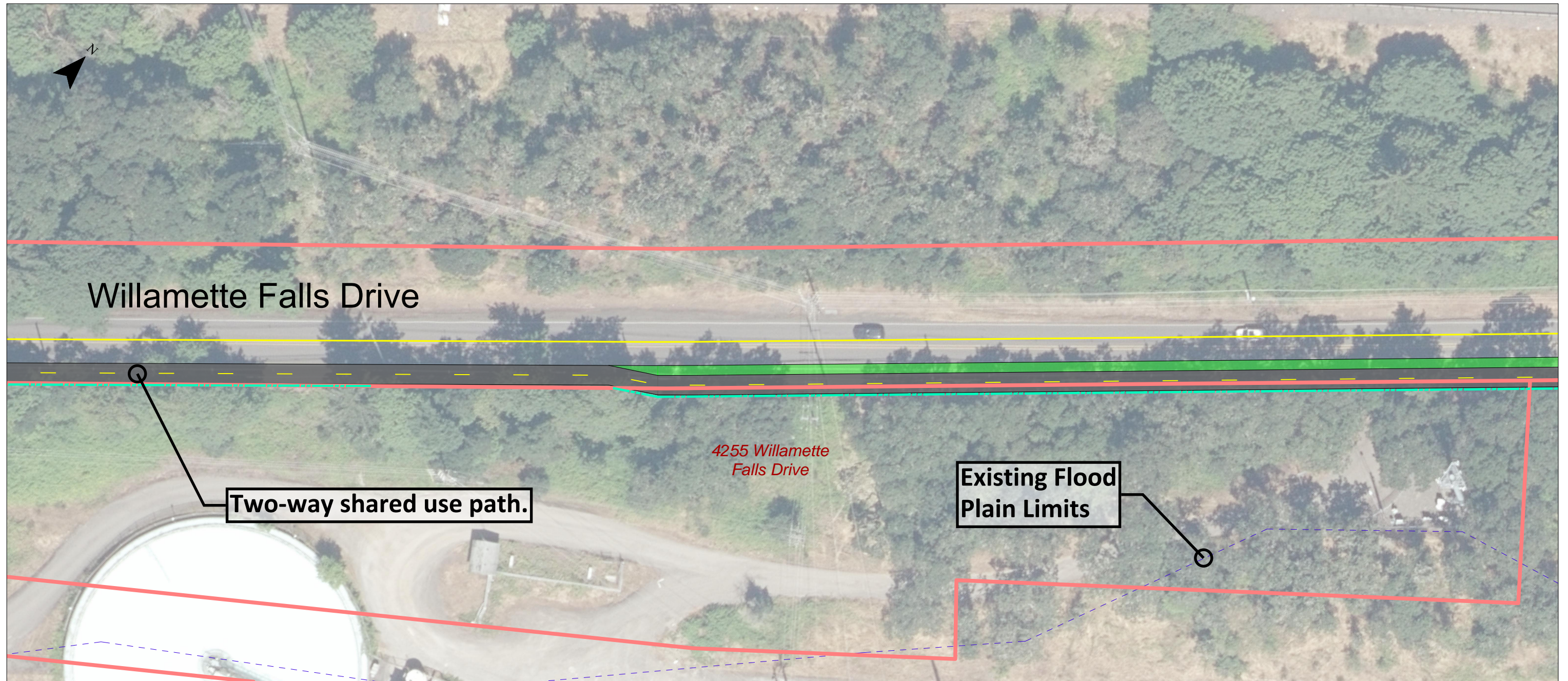


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon | **Figure 17**

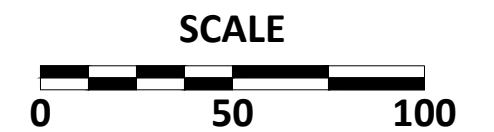
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Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**

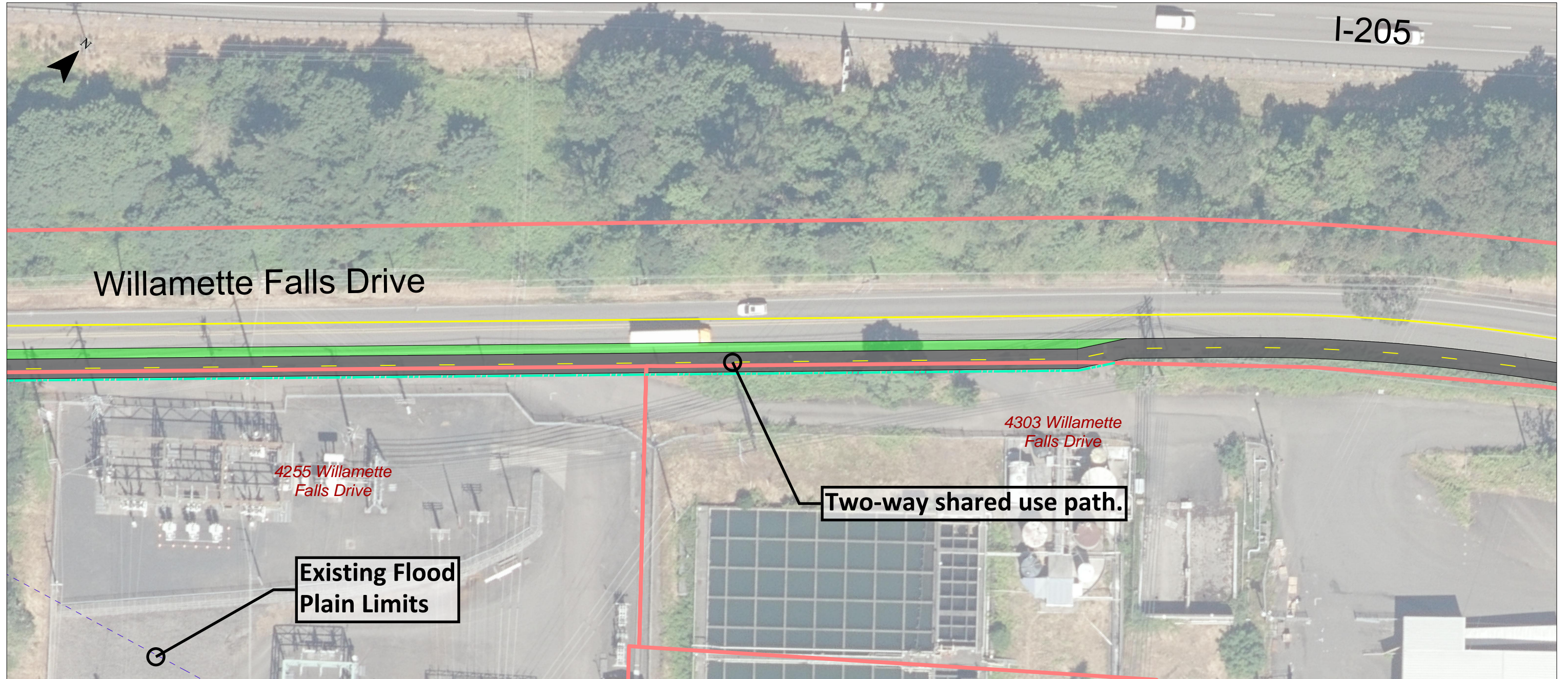


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon | **Figure 18**

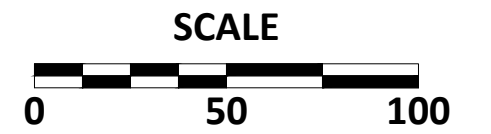
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Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**

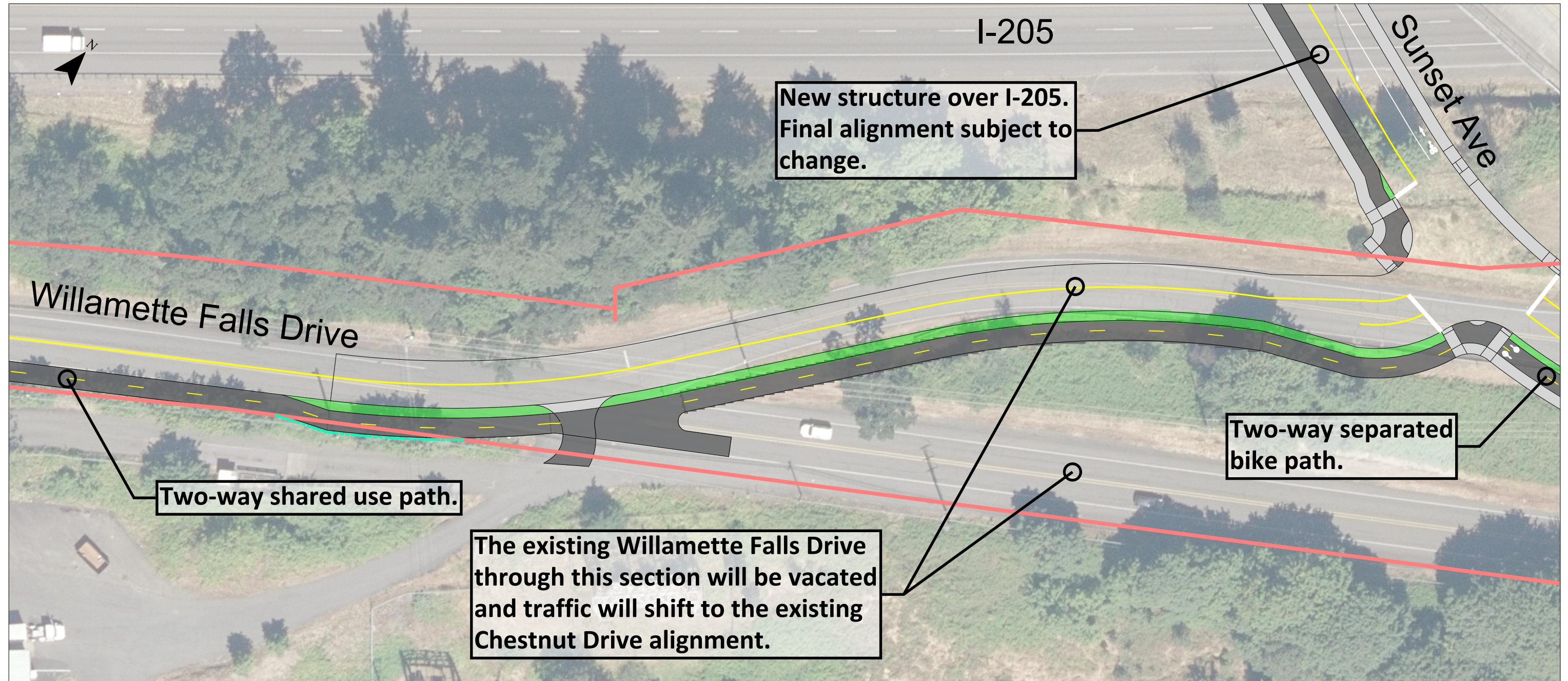


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon **Figure 19**

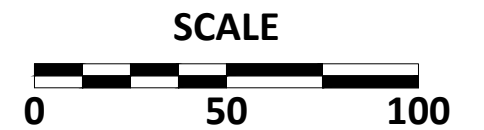
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Aerial imagery provided by City of West Linn GIS

- Sidewalk
- Protected Bike Facility
- Buffer/Landscape
- TriMet Bus Stop Location<sup>1</sup>
- Intersection to be refined at later design stage
- Potential Right-of-way Impacts<sup>2</sup>

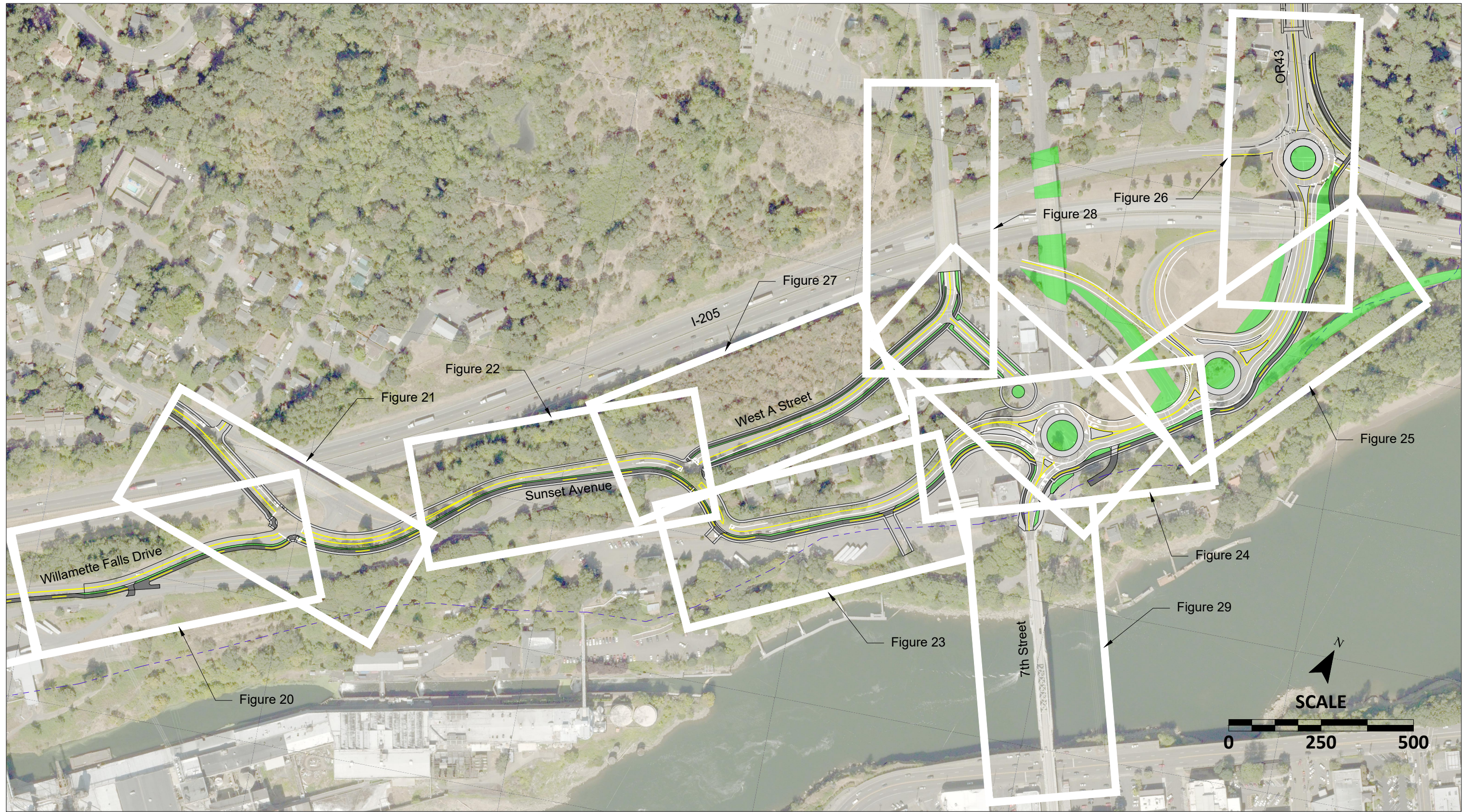


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon Figure 20

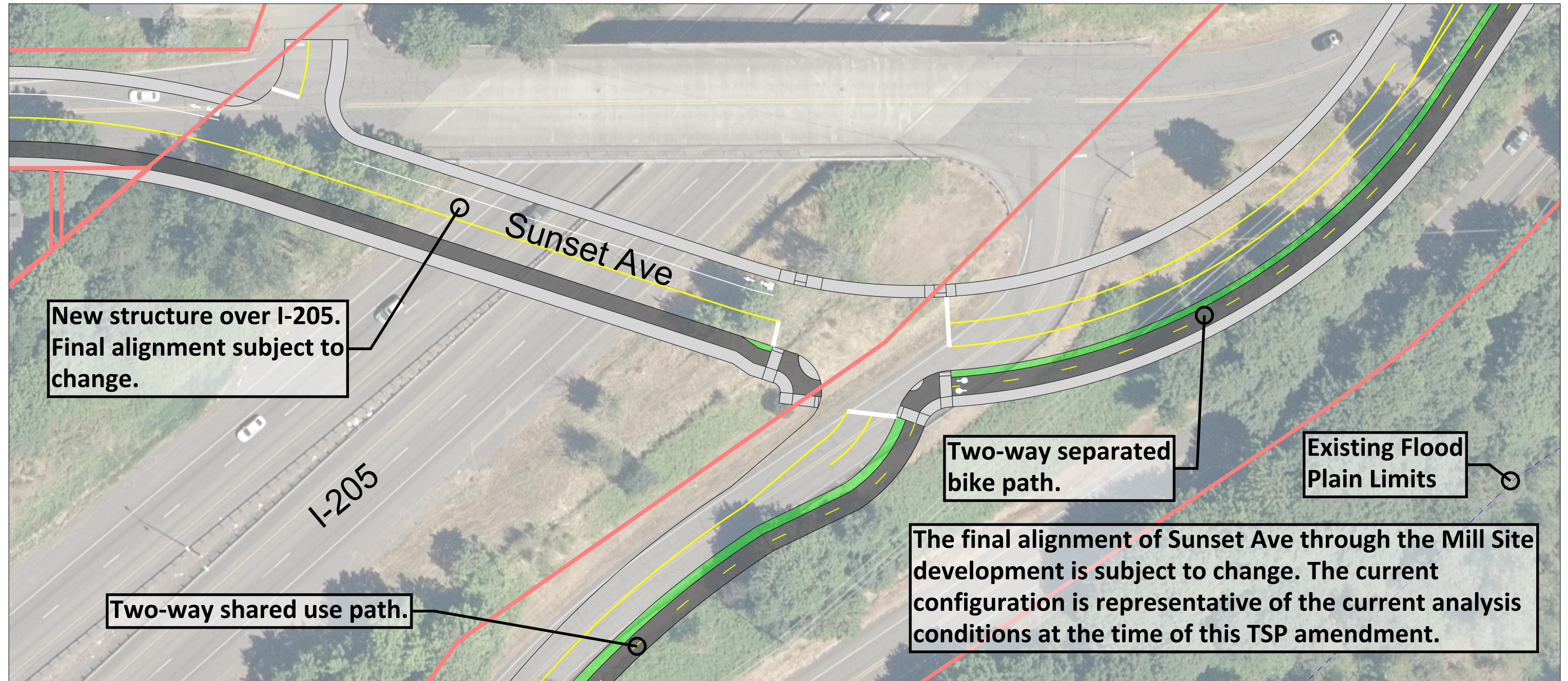


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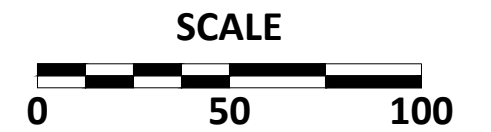
West Linn, Oregon | Figure 20-A





Aerial imagery provided by City of West Linn GIS

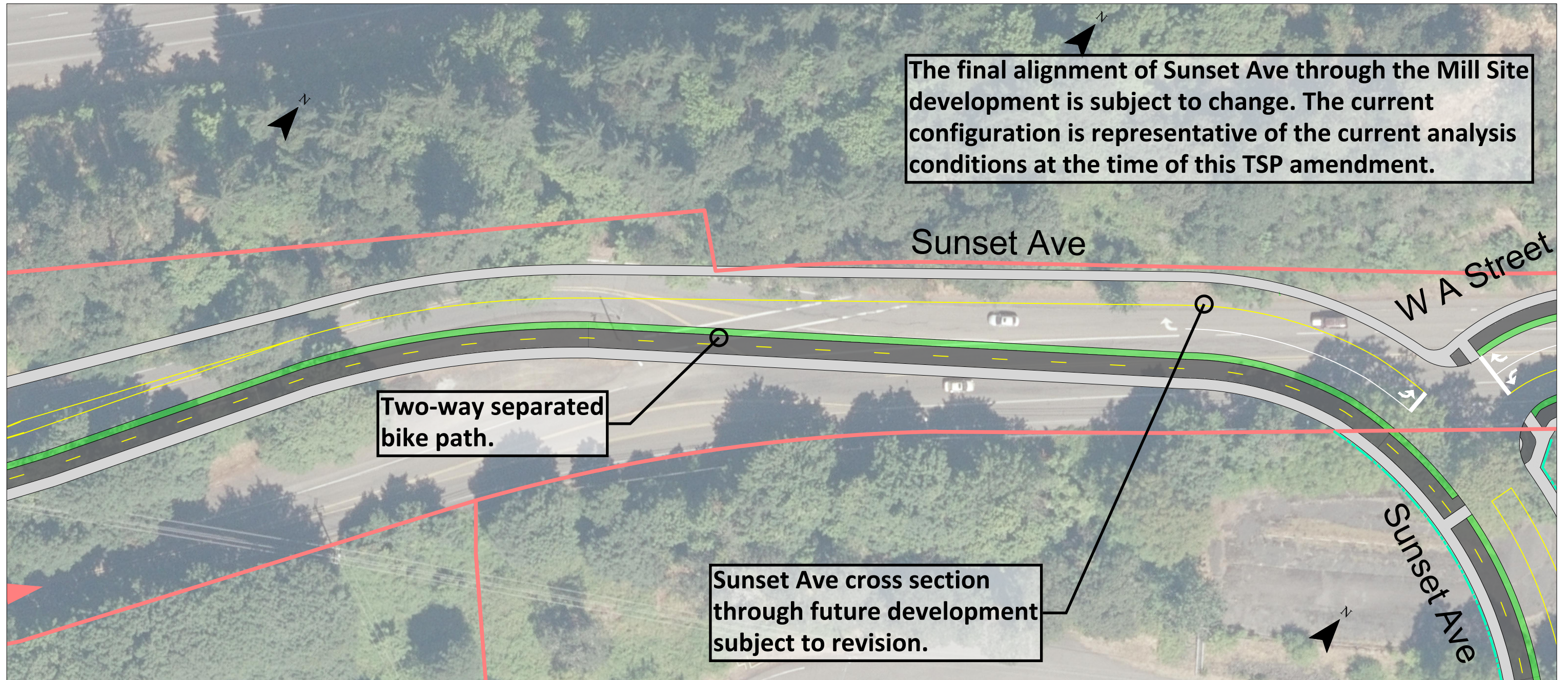
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

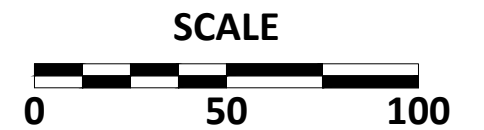
West Linn, Oregon | Figure 21





Aerial imagery provided by City of West Linn GIS

-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>

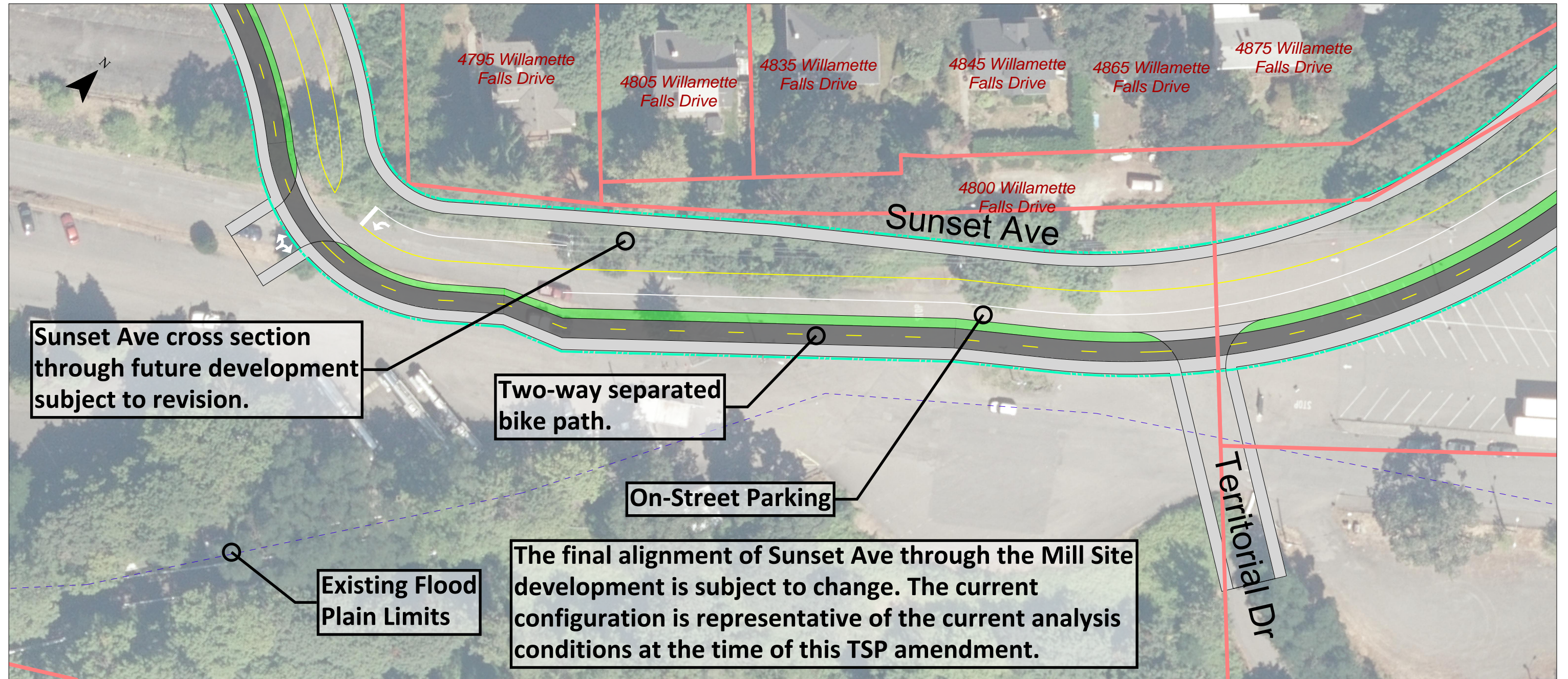


<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.







<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

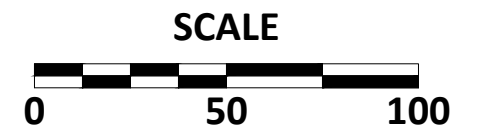
West Linn, Oregon | Figure 22





Aerial imagery provided by City of West Linn GIS

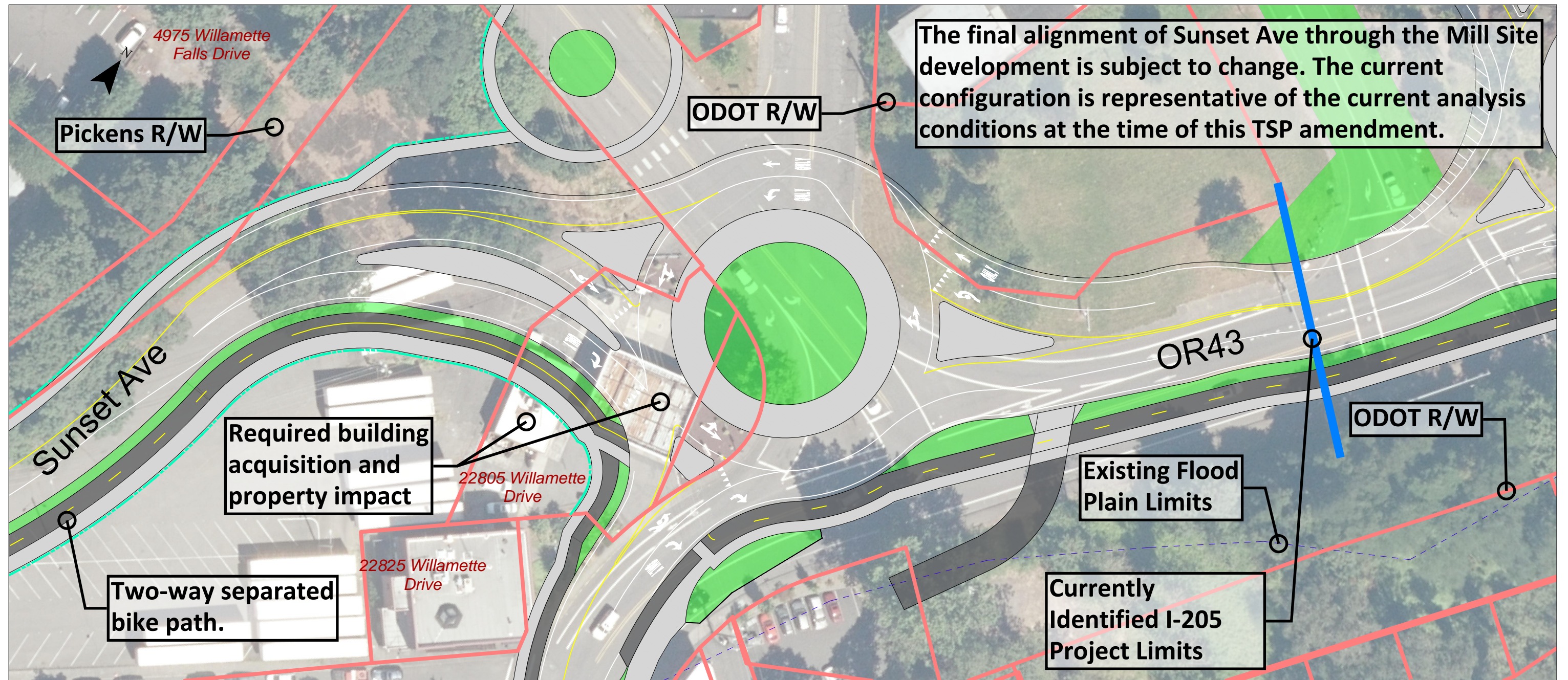
-  **Sidewalk**
-  **Protected Bike Facility**
-  **Buffer/Landscape**
-  **TriMet Bus Stop Location<sup>1</sup>**
-  **Intersection to be refined at later design stage**
-  **Potential Right-of-way Impacts<sup>2</sup>**



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

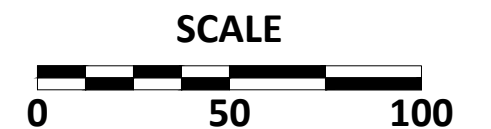
West Linn, Oregon **Figure 23**





Aerial imagery provided by City of West Linn GIS

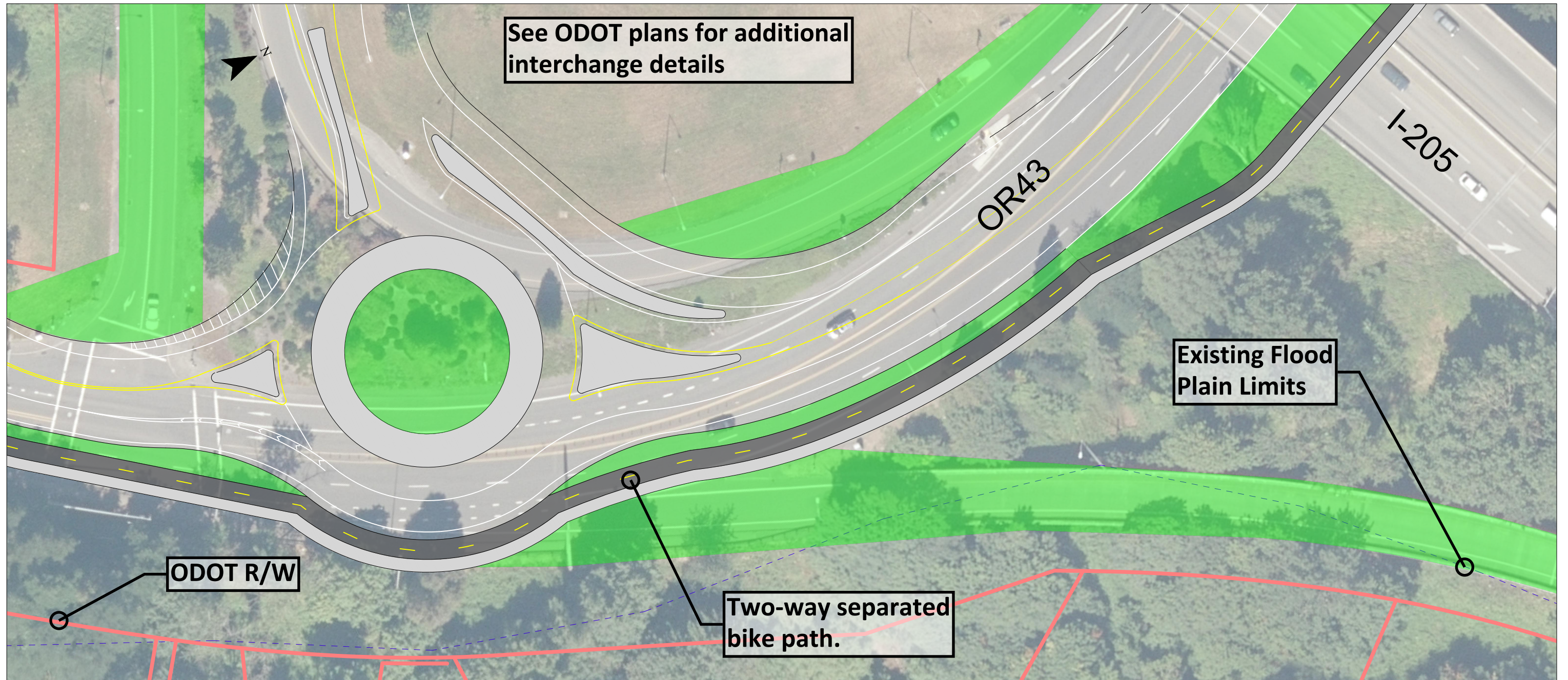
- Sidewalk
- Protected Bike Facility
- Buffer/Landscape
- TriMet Bus Stop Location<sup>1</sup>
- Intersection to be refined at later design stage
- Potential Right-of-way Impacts<sup>2</sup>









<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

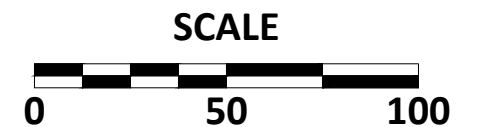
West Linn, Oregon Figure 24





Aerial imagery provided by City of West Linn GIS

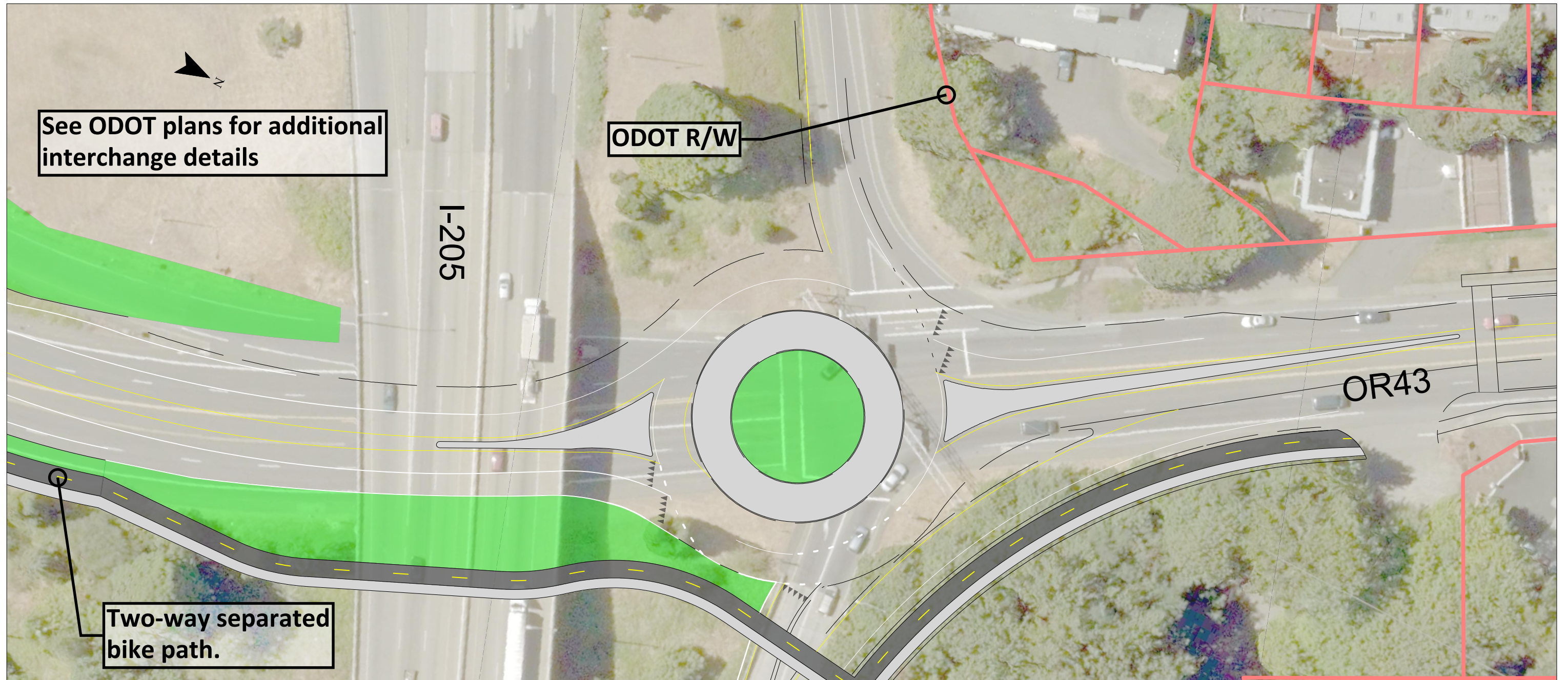
-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

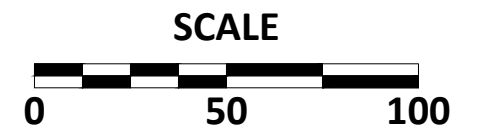
West Linn, Oregon | Figure 25





Aerial imagery provided by City of West Linn GIS

- Sidewalk
- Protected Bike Facility
- Buffer/Landscape
- TriMet Bus Stop Location<sup>1</sup>
- Intersection to be refined at later design stage
- Potential Right-of-way Impacts<sup>2</sup>



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon **Figure 26**

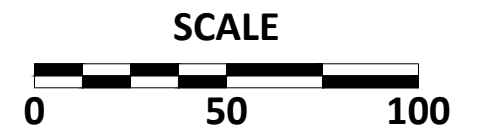


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Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

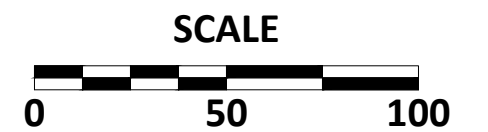
West Linn, Oregon | **Figure 27**





Aerial imagery provided by City of West Linn GIS

- Sidewalk**
- Protected Bike Facility**
- Buffer/Landscape**
- TriMet Bus Stop Location<sup>1</sup>**
- Intersection to be refined at later design stage**
- Potential Right-of-way Impacts<sup>2</sup>**



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.







West Linn, Oregon **Figure 28**

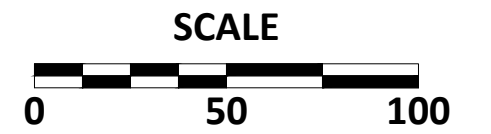
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Aerial imagery provided by City of West Linn GIS

-  Sidewalk
-  Protected Bike Facility
-  Buffer/Landscape
-  TriMet Bus Stop Location<sup>1</sup>
-  Intersection to be refined at later design stage
-  Potential Right-of-way Impacts<sup>2</sup>



<sup>1</sup> Bus stop locations are preliminary based on existing stop locations and potential stop consolidation. Final stop locations will be determined in the design phase of the project.  
<sup>2</sup> Potential Right-of-way impacts are estimated and not based on survey. Actual right-of-way impacts will be determined in the next phase after acquiring survey data and refinement of the design to account for vertical grading, stormwater retention and utility relocation.

West Linn, Oregon | Figure 29

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# Analysis of Future Traffic Conditions

## IV. ANALYSIS OF FUTURE TRAFFIC CONDITIONS

### Existing Traffic Conditions

The existing traffic conditions analysis identifies the current physical and operational characteristics of the study intersections. The analysis is based on data collected in June 2019 when school was in session and no inclement weather was present that affected typical traffic patterns. The results of the analysis indicate the following:

- All the study intersections currently operate acceptably (below capacity with relatively low delay) during the weekday AM and PM peak hours except the West A Street/WFD and OR 43/WFD intersections.
- The southbound approach to the West A Street/WFD intersection currently operates at LOS F during the weekday AM peak hour due to delay; however, the intersection operates below capacity and does not meet signal warrants.
- The eastbound approach to the OR 43/WFD intersection currently operates at LOS F during the weekday AM and PM peak hours due to delay and above capacity during the weekday PM peak hour. The intersection currently meets signal warrants.

### 2040 Conditions without Proposed Improvements

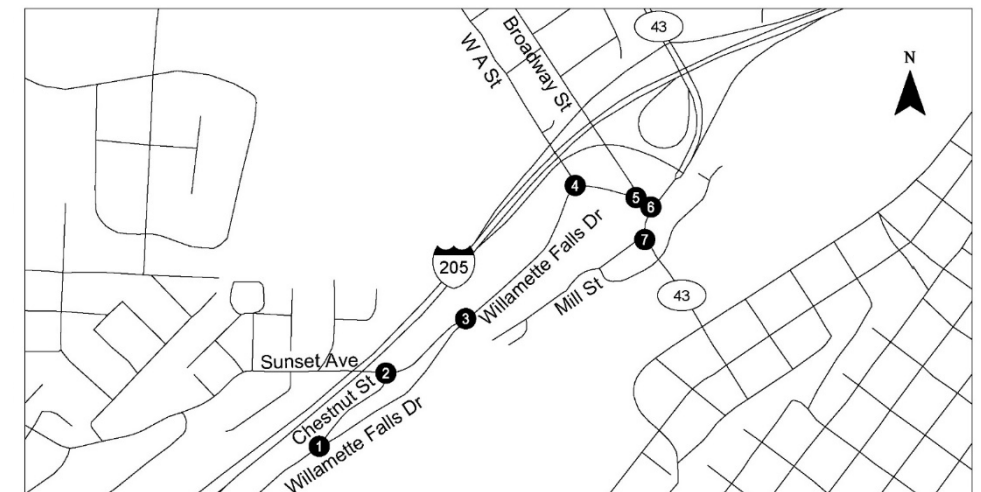
The year 2040 no-build traffic conditions analysis identifies how the study intersections will operate without the WFD Concept Plan. This analysis includes traffic attributed to general growth in the region but does not include any changes in traffic patterns related to the conceptual layout. Regional traffic growth was determined based on Metro’s regional travel demand model, which accounts for development within the study area; however, it does not account for development of the Waterfront Area with a more intensive use than is currently allowed. These impacts will need to be evaluated as part of future development applications. The results of the analysis indicate the following:

- All the study intersections are expected to operate acceptably under year 2040 no-build traffic conditions during the weekday AM and PM peak hours except the West A Street/WFD and OR 43/WFD intersections.
- The southbound approach to the West A Street/WFD intersection is expected to operate at LOS F during the weekday AM and PM peak hours due to delay; however, the intersection is expected to operate below capacity and is not expected to meet signal warrants.
- The eastbound approach to the OR 43/WFD intersection is expected to operate at LOS F and is above capacity during the weekday AM and PM

peak hours. The intersection is expected to meet signal warrants.

**Table 1: 2040 Future Base Weekday Peak Hour Intersection Level of Service without Proposed 2021 Plan**

Map ID	AM Peak Hour				PM Peak Hour				Agency	Standard /Target	Met?
	Delay	LOS	V/C	95% Queues Exceed Storage?	Delay	LOS	V/C	95% Queues Exceed Storage?			
1	10.6	B	0.07	No	9.6	A	0.05	No	West Linn	LOS D	Yes
2	16.8	C	0.11	No	15.2	C	0.09	No	West Linn	LOS D	Yes
3	25.4	D	0.71	No	14.6	B	0.33	No	West Linn	LOS D	Yes
4	88.1	F	0.54	No	68.9	F	0.76	No	West Linn	LOS D	No
5	13.0	B	0.06	No	20.1	C	0.29	No	West Linn	LOS D	Yes
6	170.1	F	1.14	Yes	248.2	F	1.38	Yes	ODOT	LOS E/1.1	No
7	73.0	F	0.19	No	64.0	F	0.13	No	ODOT	LOS E/1.1	Yes





# IV. Analysis of Future Traffic Conditions

## 2040 Conditions with Proposed Concept Design

The year 2040 build traffic conditions analysis identifies how the study intersections will operate with the conceptual layout as well as with signalized and unsignalized intersections and roundabouts. Forecast traffic volumes were developed at the study intersections by re-routing the background traffic volumes to reflect the conceptual layout. The results of the analysis indicate the following:

- All the study intersections are expected to operate acceptably under year 2040 build traffic conditions during the weekday AM and PM peak hours assuming buildout of the WFD Concept Plan.

**Table 2: 2040 Future Base Weekday Peak Hour Intersection Level of Service with Proposed 2021 Plan**

Map ID	AM Peak Hour				PM Peak Hour				Agency	Standard/Target	Met?
	Delay	LOS	V/C	95% Queues Exceed Storage?	Delay	LOS	V/C	95% Queues Exceed Storage?			
<b>Two-way Stop-Control</b>											
2	43.1	E	0.28	No	23.1	C	0.13	No	West Linn	LOS D	Yes
3	70.8	F	0.47	No	>80	F	0.84	No	West Linn	LOS D	No
6	>80	F	>1.1	Yes	>80	F	>1.1	Yes	ODOT	LOS E/1.1	No
<b>Traffic Signals</b>											
Not Analyzed – Does Not Meet Signal Warrants											
2											
3	8.2	A	0.50	No	7.3	A	0.54	No	West Linn	LOS D	Yes
6	7.8	A	0.44	Yes <sup>1</sup>	10.9	B	0.42	Yes <sup>1</sup>	ODOT	LOS E/1.1	Yes
<b>Roundabouts</b>											
Not Analyzed – Topographical Constraints											
2											
3	17.4	B	0.80	No	14.8	B	0.76	No	West Linn	LOS D	Yes
6	9.7	A	0.75	No	17.4	B	0.85	Yes <sup>2</sup>	ODOT	LOS E/1.1	Yes



## Intersection Control Evaluation

An Intersection Control Evaluation (ICE) (see Appendix “II”) was conducted at the study intersections to determine the most appropriate lane configurations and traffic control devices to address existing and projected future traffic conditions. The analysis included an evaluation of existing, year 2040 no-build, and year 2040 build traffic conditions assuming reconfiguration of the intersections as two-way stop control, traffic signals, and roundabouts. The findings and recommendations from the analysis are summarized below.

**Table 3: Intersection Control Evaluation Summary**

	Keep as Minor-Approach Stop-Control	Install Traffic Signal	Install Roundabout
WFD/Sunset Drive	Acceptable operations	Does not meeting signal warrants	Topographical constraints preclude roundabout
West A Street/WFD	Operates under capacity with higher delays near horizon year which may warrant a signal	Acceptable operations	Acceptable operations and safety performance
OR 43/WFD	Unacceptable operations	Acceptable operations but less desirable safety performance	Acceptable operations and desirable safety performance



# Plan Implementation

## V. PLAN IMPLEMENTATION

### Design Phase Refinement Needs

As the plan moves towards implementation through private development land use actions or capital projects, the design of the corridor will need to provide more detail on some aspects of the plan.

- **Right-of-way needs** – A more detailed right-of-way analysis is needed in order to fully understand the right-of-way impacts of the concept design. The impacts shown in this plan are approximate and will be refined in a later design stage. Right-of-way acquisitions costs are preliminary in nature and final costs could vary considerably.
- **Detailed topographic survey and engineering design** – The 30% concept design and cost estimates will need to be refined in the design phases to account for field conditions along the corridor and the need for retaining walls, utility relocation, storm drainage, and other considerations.
- **Lighting** – Existing lighting is limited along the corridor. Enhanced lighting should include City standard LED mast arm pole lighting at signalized intersections. In addition, City standard lighting should be enhanced at unsignalized intersections and designated pedestrian crossings. Street lighting should follow City Public Works standards for new development and/or be power pole based using PGE standard LED lighting. In public capital projects, lighting will coordinate with electric utility pole placement following Public Works standards to the maximum extent practical.
- **Utility Relocation** – Due to the nature of the corridor and cost associated with conversion of overhead electric to underground, it is assumed that public capital projects will maintain and/or relocate overhead utilities in accordance with existing franchise utility agreements. Private development projects will be responsible for undergrounding utilities consistent with City code requirements.
- **Intersection design and operations** – Protected intersections will need further curb radius and multimodal accommodations accounted for in final design. At unsignalized approaches, the design of each side street or driveway will need to carefully consider appropriate treatments for the bicycle facility crossing, based on sight distance, topography and property impacts.
- **Bus stop placement and design** – TriMet has been involved in the development of the WFD Concept Plan. As the pedestrian and bicycle facilities on the corridor improve, TriMet should be involved in the refinement of bus stop placement and design along the corridor as appropriate.
- **Location and design of enhanced pedestrian crossings** – The WFD Concept Plan includes continuous sidewalks and bicycle facilities to enhance the ability for people to walk and bike along the corridor, Oregon State law gives pedestrian the legal right to cross at any intersection, with motor vehicles required to yield. To enable comfortable access to destinations on both sides of the corridor as well as to transit stops, the future design phase will consider enhanced pedestrian crossing locations in addition to the signalized intersections. The design of these enhanced crossings will consider a variety of potential treatments, including a striped crosswalk, signage, rectangular rapid flash beacons, or pedestrian hybrid beacons. The design phase will determine the locations of enhanced crossings based on pedestrian demand, sight distance, proximity to signalized intersections and other factors.



# V. Plan Implementation

## Cost Estimates

Detailed cost estimates for implementing the WFD Concept Plan will be developed during final design of the concept. The estimates should assume conventional storm drainage systems will be constructed with the roadway along with stormwater quality enhancements such as rain gardens. The estimates should include construction, right-of-way acquisitions, design, construction administration, and a contingency.

Preliminary cost estimates have been prepared for the following segments that include the assumptions listed above:

**Table 4: Cost Estimate for Construction of 2021 Plan**

Segment	Approximate Construction Cost	Approximate R/W Cost
1 Tualatin to Ostman Road	\$7,619,000	\$416,000
2 Ostman Road to 16th Street	\$3,157,000	\$298,000
3 10th Street to Sunset Avenue	\$12,376,000	\$76,000
4 Sunset Avenue to I-205	\$10,871,000	N/A
Willamette Falls Drive Corridor	\$34,023,000	\$790,000
Project Totals		
Combined Construction and R/W	\$34,813,000	

## Implementation Steps

The WFD Concept Plan represents the goals of the community and is reflective of public input and desires. The concept plan represents a balance of providing high quality facilities to serve a variety of travel modes while managing costs and impacts to adjacent parcels. Implementation of the WFD Concept Plan is critical to the success of West Linn’s goals for its transportation system. Willamette Falls Drive provides a continuous connection between the Willamette and Bolton neighborhood that parallels I-205 and access to all the residences, businesses, and other destinations located in between. As such, it must provide access for people and goods moving on foot, by bike, by transit or in motor vehicles. It is also a significant utility corridor serving local needs. The implementation of the WFD Concept Plan can occur in several phases and incrementally through redevelopment along the corridor.

## Plan Adoption

The WFD Concept Plan will be adopted by City Council as an amendment to the 2016 City of West Linn Transportation System Plan. As an adopted part of the Transportation System Plan, the WFD concept plan provides direction to the City in pursuing funding as well as setting clear requirements for property owners in terms of right-of-way dedication and frontage improvements. The City should refer to the WFD concept plan for potential changes in the type of planned improvement as well as the location and orientation of the

planned improvements included in the TSP. Per the City of West Linn’s Charter, impacts to parks and open spaces (for purposes other than recreation) require a public vote of approval. A public vote would take place prior to any final design adoption or implementation.

## Implementation through development and redevelopment

Implementation of the WFD Concept Plan through private development land use actions and/or land use amendments will follow the development application and approval procedures of the City of West Linn. The WFD Concept Plan (through its adoption) will serve as the transportation system plan element for Willamette Falls Drive and provide guidance for identifying the necessary transportation facility provisions (e.g., right-of-way, improvements, traffic control devices, etc.) associated with a specific land use action(s) and amendment(s). However, the WFD Concept Plan’s adoption does require the City to consider the following elements when reviewing and approving specific land use actions:

- **Right-of-Way Dedication Requirements:** Right-of-way dedications should be consistent with the WFD Concept Plan and typical cross section shown in the appendix.



# V. Plan Implementation

- **Direction of Required Construction of Improvements, Partial Improvements, or Fee-in-Lieu Payments:** The City will require through conditions of approval and/or development agreements the specific improvements, partial improvements, or fee-in-lieu payments consistent with and necessary to implement the WFD Concept Plan based on the impacts and properties associated with the specific land use actions and/or agreement.
- **Administration of Fee-in-lieu Payments (Optional):** The City may seek to receive fee-in-lieu of construction payments for land use actions that would result in smaller isolated elements of the corridor being constructed prior to use. These funds would need to be properly administered by the City in order to both preserve and allocate the funds in the most appropriate manner to facilitate the implementation of the overall improvements.

## Implementation as a capital improvement project

Implementation through development will occur gradually over time and in small increments; however, implementation as a capital improvement project has the potential to improve significant segments or even the entire corridor within a relatively short time period. Funding sources for capital improvement projects such as this include a variety of local, regional, state, and national sources, as follows:

- **Regional Flexible Funds** – Metro allocates federal funding dollars through the Regional Flexible Funds program as part of the Metropolitan Transportation Improvement Program (MTIP). Metro maintains and updates funding priority policy guidance with reoccurring funding application periods. The City of West Linn is eligible to apply for this funding.
- **Better Utilizing Investments to Leverage Development** – BUILD grants are awarded by the US Department of Transportation to support innovative projects across the country that promote economic development and improve transportation access for a variety of communities. The City of West Linn could consider applying for a future BUILD Grant to fund the construction of the WFD Concept Plan.
- **Local Funding Sources** – The City has a variety of funding sources that contribute to funding transportation improvements that could be leveraged as local match funds for grants or could be used to fund portions of the WFD Concept Plan. These sources include the state gas tax and license fees, a roadway maintenance fee, franchise and miscellaneous fees, and system development charges. The sources are described in more detail in the Transportation System Plan.

## ADJACENT PROJECTS

There are three ongoing design projects directly adjacent to the Willamette Falls Drive project described in this memorandum:

- I-205 Corridor Widening Project (Oregon Department of Transportation)
- Old Mill Site Development Project (Private Developer)
- Historic Willamette Falls Drive Project [10<sup>th</sup> to 16<sup>th</sup> Street] (City of West Linn)
- Oregon City-West Linn Pedestrian-Bicycle Bridge Concept Plan (Oregon City, West Linn, Clackamas County, Metro, and ODOT)

Each project is responsible for key components of the overall WFD corridor connectivity, but this project can be staged to construct most of the improvements regardless of when each of the three projects listed above are constructed.

There are projects currently outlined in the City's TSP that will be affected by this updated concept plan.



# V. Plan Implementation

## TSP ELEMENTS MODIFIED BY ADOPTION OF THE WFD CONCEPT PLAN

The pedestrian, bicycle, and motor vehicle elements of the 2016 TSP include projects along WFD that will be impacted by adoption of the WFD concept plan. The following summarizes the projects and how they will be impacted.

### Pedestrian Plan Projects

The following Pedestrian Plan projects will be impacted by adoption of the WFD Concept plan:

- Project P56 involves installing sidewalks on WFD from West A Street to Sunset Avenue. This segment of WFD is addressed by Segment 4 of the WFD Concept Plan; therefore, this project should be removed from the TSP.
- Project P57 involves installing sidewalks on WFD from Sunset Avenue to 10th Street. This segment of WFD is addressed by Segment 3 of the WFD Concept Plan; therefore, this project should be removed from the TSP.
- Projects P58, P60, and P61 involve installing sidewalks on WFD from the 16th Street to Ostman Road. This segment of WFD is addressed by Segment 2 of the WFD Concept Plan; therefore, these projects should be removed from the TSP.
- Projects P59 and P62 involve installing sidewalks on WFD from the Ostman Road to Tualatin River. This segment of WFD is addressed by Segment 1 of the WFD Concept

Plan; therefore, these projects should be removed from the TSP.

### Bicycle Plan Projects

The following Bicycle Plan projects will be impacted by adoption of the WFD Concept plan:

- Project B12 involves installing cycle tracks on WFD from Willamette Drive to Sunset Avenue. This segment of the WFD is addressed by Segment 4 of the WFD Concept Plan; therefore, this project should be removed from the TSP.
- Project B13 involves installing cycle tracks on WFD from Sunset Avenue to 10th Street. This segment of WFD is addressed by Segment 3 of the WFD Concept Plan; therefore, this project should be removed from the TSP.
- Project B37 involves installing interim treatments for bicyclists on WFD. This project should be removed from the TSP.
- Project B39 involves installing cycle tracks on WFD from 10th Street to the 14th Street. This project should be removed from the TSP.
- Project B40 involves installing cycle tracks on WFD from 14th Street to the Tualatin River Bridge. This segment of the WFD is addressed by Segments 1 and 2 of the WFD Concept Plan; therefore, this project should be removed from the TSP.

### Motor Vehicle Plan Projects

The following Motor Vehicle Plan projects will be impacted by adoption of the WFD Concept plan:

- Project M9 involves upgrading WFD from the Tualatin River Bridge to Dollar Street. This segment of WFD is addressed by Segment 1 and 2 of the WFD Concept Plan; therefore, this project should be removed from the TSP.
- Project M17 involves installing a traffic signal at the WFD/Sunset Avenue intersection. The location and orientation of the WFD/Sunset Avenue intersection will be reconfigured as part of the WFD Concept Plan; therefore, this project should be removed from the TSP.
- Project M33 involves installing a traffic signal at the WFD/Willamette Drive intersection. The location and orientation of the WFD/Willamette Drive intersection will be reconfigured as part of the WFD Concept Plan; therefore, this project should be removed from the TSP and the City should refer to the WFD Concept plan.

## REFERENCES

1. West Linn Transportation System Plan



# **West Linn Willamette Falls Drive 2021 Conceptual Design Plan**

## **Technical Appendices**

1. Traffic Operations Analysis
2. Segment Alternatives Memorandum