

# 5 SOUTH STUDY AREA ANALYSIS

## 5.1 INTRODUCTION

### 5.1.1 What Is the Need for and Context of the Corridor Level Evaluation?

As noted in Chapter 1 of this EA, the I-5 JBLM Vicinity Congestion Relief Project (**Project**) is a program of proposed improvements planned within north and south study areas. In the North Study Area, generally between Steilacoom-DuPont Road (Exit 119) and Gravelly Lake Drive (Exit 124), a project-specific Build Alternative has been defined. Specific impacts and mitigation for these improvements are discussed in detail in Chapter 4. In the South Study Area, generally located between Mounts Road (Exit 116) and Steilacoom-DuPont Road (Exit 119), (see figure 5.1-1) a specific build alternative has not been defined. Design and construction of planned improvements in the North Study Area would not preclude design options or otherwise dictate an outcome within the South Study Area. The South Study Area is being evaluated at a corridor level. A corridor level evaluation is a broad first tier analysis that will have more detail applied in a second tier analysis when a specific build alternative is defined.

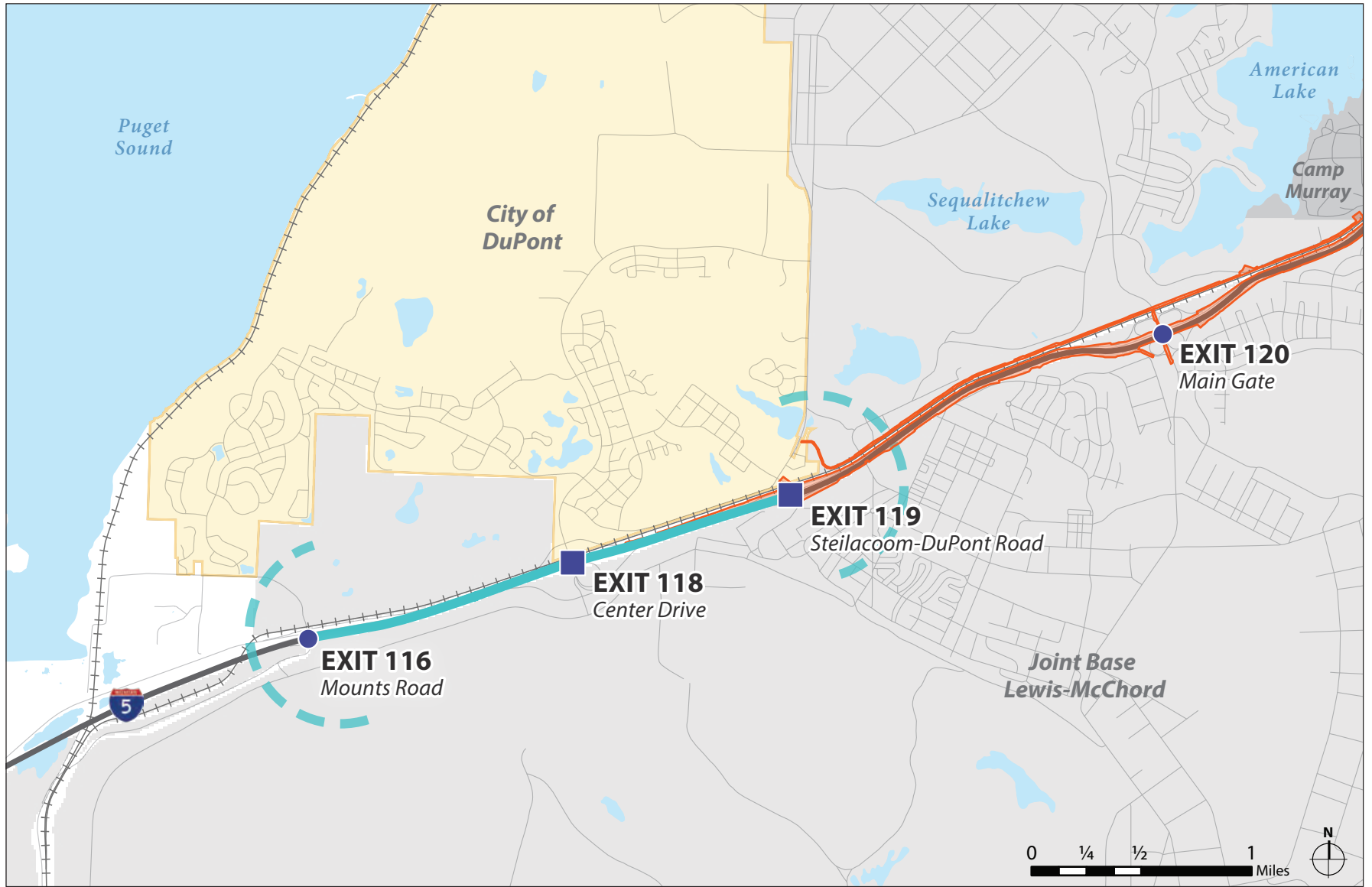
The first tier focuses on a general description of potential improvements, approximate physical limits, and a broad discussion of potential environmental conditions. Results of this evaluation are documented in this chapter. This evaluation will be used to inform

project specific design development, engage stakeholders and stimulate public discussion of possible South Study Area environmental issues. It can also highlight work tasks that should be included in a later second tier evaluation focusing on project-specific environmental studies and documentation when a specific build alternative has been defined.

**NOTE TO READER:** *This EA provides a tiered environmental review. Chapter 4 evaluates the project specific environmental impacts associated with construction of the North Study Area Build Alternative (See Section 3.4 for description). Chapter 5 provides a corridor level discussion of the South Study Area (See Section 3.5). Specific project footprint improvements are not currently defined for the South Study Area.*

### 5.1.2 What Is the Scope of the South Study Area Evaluation?

As shown in Figure 5.1-1, a corridor level evaluation has been conducted for the South Study Area. It generally covers the area between the Steilacoom-DuPont Road interchange (Exit 119) and the Mounts Road interchange (Exit 116), a distance of approximately three miles. Proposed future actions in the South Study Area are broadly identified and distinguished from actions that are addressed in the



- Existing I-5 Mainline
- Enhance I-5 Capacity
- Existing Interchange
- Evaluate Interchange Options
- South Study Area
- Build Alternative Footprint

**Figure 5.1-1**  
Potential South Study Area Improvements

North Study Area Build Alternative portions of this EA. A range of potential impacts and an approach to identifying possible mitigation or conservation measures is also discussed.

### 5.1.3 What Are the Potential Improvements in the I-5 Corridor That Are Addressed Here?

Potential improvements within the South Study Area of the corridor are intended to relieve congestion on I-5 during peak traffic periods, while maintaining access to JBLM and the neighboring communities. The evaluation of alternatives leading to this EA identified that increasing I-5 capacity is necessary to accomplish the purpose.

At the Steilacoom-DuPont Road interchange (Exit 119), the existing bridge over I-5 was built in 1957. The openings at this bridge for the I-5 directional roadways are just over 50 feet wide and are limiting factors for adding lanes to I-5. The overpass also does not meet current height standards for its vertical clearance from I-5. In addition, traffic flow is constrained by the close proximity of the ramp intersections with public surface streets, JBLM's DuPont Access Control Point (ACP), the Sound Transit railroad, and the intersection of Wilmington Drive and Barksdale Avenue.

Improvements in the South Study Area between Steilacoom-DuPont Road and Mounts Road are anticipated to include adding capacity to the I-5 mainline. Added I-5 capacity would need to be configured to be operationally compatible with existing travel lanes at the Mounts Road interchange.

The existing (original) interchange at Steilacoom-DuPont Road (Exit 119) is a constraint to traffic flow on I-5 and to/from JBLM and the communities to the west of I-5. Reconfiguration of this interchange would allow for improved traffic movement.

Previous studies (see Table 2.2-1 in Chapter 2) recommended re-construction of the Steilacoom-DuPont Road interchange approximately 1,000 feet north of its existing location. This option was recommended because it would allow for grade-separation of the interchange roadway with the Sound Transit railroad. Associated with the recommended interchange was construction of a reconfigured JBLM DuPont ACP (gate) that was conceptually designed jointly by WSDOT and the Army Corps of Engineers. The reconfiguration of the ACP was necessary because the new interchange design was not compatible with the existing ACP location. In October of 2015, JBLM informed WSDOT that the proposed reconfiguration of the ACP was undesirable due to concerns regarding DuPont Gate safety and JBLM base security. JBLM expressed an interest in reconfiguring the ACP to connect at the Center Drive interchange as a possible alternative to a modified DuPont Gate. The scope of this request necessitates further evaluation of options and impacts including the possible need for modifying the Center Drive interchange. This evaluation would be completed in collaboration with the Project stakeholders.

The impacts associated with improvements in the South Study Area are unknown until a build alternative has been defined and a proposed footprint established.

### 5.1.4 Timing and Sequence of Future Decisions

Improvements along the I-5 corridor are intended to be implemented in a sequence of construction contracts that generally move from the north to the south. After approval of the I-5 JBLM Vicinity Congestion Relief Project EA, and completion of all necessary project-specific environmental permitting, purchase of right of way, and final design activities, construction is expected to proceed in the North Study Area. It is anticipated that this would occur between 2018 and 2021.

Analysis of specific improvement options for the South Study Area is expected to begin in late 2016 and be completed in 2017. Construction of identified improvements in this area is anticipated to occur following the improvements identified in the Build Alternative, anticipated for construction, in the period between approximately 2021 and 2024. A key trigger for South Study Area activity would be a determination by JBLM of the relocation and/or modification of the DuPont ACP. It is expected that this corridor level analysis will form the basis for developing future project-specific NEPA documentation for the proposed improvements in the South Study Area.

## 5.2 WHAT RANGE OF ALTERNATIVES HAS BEEN IDENTIFIED?

Due to the lack of information about a future configuration for the JBLM DuPont ACP, a range of South Study Area interchange improvement alternatives cannot be developed and evaluated for the corridor level analysis. To provide context for improvement alternatives or design options in the corridor level stage, the prior analysis conducted for the I-5 corridor is included by reference. A preferred I-5 mainline configuration has been identified through the earlier work, and is described in Section 5.1.3.

Additionally, as part of the multimodal improvement alternatives analysis for the Build Alternative, a wide range of options were previously considered for the three interchanges in the South Study Area (Steilacoom-DuPont Road/Exit 119, Center Drive/Exit 118, and Mounts Road/Exit 116). As possible improvements in the South Study Area are further developed, it will be important to build on that earlier analysis and to study alternatives that address interchange improvement needs. If the DuPont ACP is moved to the Center Drive interchange, a reconfiguration of this interchange may be needed

to address traffic volume shifts and other concerns that may be identified by JBLM, DuPont and/or other Project stakeholders.

Any future analysis of alternatives or design options at the three South Study Area interchanges should address the full range of potential impacts associated with the preferred improvement scenario. Additionally, alternatives should meet the overall Project purpose. The alternatives would be the subject of subsequent environmental analysis that recognizes and reflects the detailed assessment previously conducted.

## 5.3 WHAT POTENTIAL ENVIRONMENTAL ISSUES HAVE BEEN IDENTIFIED?

### 5.3.1 Transportation

The Project corridor for the entire I-5 JBLM Congestion Relief Project is identified in Figure 1.2.1. Analysis of existing transportation conditions, as well as future 2020 and 2040 Build and No Build conditions are described in detail in the prior study reports (Table 2.2.1 in Section 2) and summarized for the Build Alternative in Section 4.3. The transportation study area for South Study Area focuses on the I-5 corridor and includes the interchanges at Steilacoom-DuPont Road (Exit 119), Center Drive (Exit 118) and Mounts Road (Exit 116). Within this area, I-5 is a divided highway with three general purpose lanes in each direction. Northbound and southbound auxiliary lanes are located between the Steilacoom-DuPont Road and Center Drive interchanges. A southbound auxiliary lane is also located between Center Drive and Mounts Road.

A key finding of the existing conditions analysis in the South Study Area was that high levels of southbound PM peak exiting and entering traffic, from the close-proximity ramps between the Steilacoom-DuPont Road and Mounts Road interchanges, result

in significant weaving and causes drivers to shift lanes frequently, resulting in slow travel speeds.

Consistent with the regional travel demand modeling framework provided by the Puget Sound Regional Council (PSRC), traffic volume forecasts were prepared for the entire I-5 JBLM Project corridor for peak periods in 2020 and 2040. Key findings for the freeway mainline and interchanges in the South Study Area include:

- ◆ In 2020, PM peak period northbound speeds along I-5 are expected to be at less than 40 mph with the No Build condition, increasing to 60 mph with modeled mainline improvements in the South Study area. In the southbound direction, PM peak period speeds are expected to be less than 40 mph in the vicinity of Center Drive with either the No Build or Build Alternative. The three-lane highway capacity constraints south of the Mounts Road interchange strongly influence traffic performance in the South Study Area, particularly in the southbound travel direction.
- ◆ In 2040, PM peak period northbound speeds along I-5 are expected to be in the range of 5 to 10 mph with the No Build condition, increasing to approximately 15 mph in the vicinity of Center Drive with the Build Alternative. In the southbound direction, PM peak period speeds are expected to be below 15 mph with either the No Build or Build Alternative. As with the 2020 analysis, capacity constraints south of the Mounts Road interchange affect long-term traffic operations in the South Study Area.

For the No Build Alternative in the 2020 AM peak hour, the intersection of Steilacoom-DuPont Road with Barksdale Avenue/Wilmington Drive is expected to operate at Level of Service (LOS) F. 2020 PM peak hour traffic at the I-5/Center Drive southbound on-ramp is expected to back up from the ramp meter through the

intersection with Center Drive and then to the west along Center Drive. The potential exists for traffic to be queued through the signalized intersections at Wilmington Drive and McNeil Street. The ramp metering rate at this location is currently actively managed so queues do not extend to the Wilmington Drive or McNeil Street intersections. 2020 PM peak hour traffic at the unsignalized I-5 southbound ramp intersection with Mounts Road is expected to operate at LOS F.

For the No Build Alternative in the 2040 AM peak hour, the intersections at the I-5 interchange with Steilacoom-DuPont Road and at the intersection of Steilacoom-DuPont Road with Barksdale Avenue/Wilmington Drive are expected to operate at LOS F. As with the 2020 conditions, 2040 PM peak hour traffic at the I-5 southbound intersection with Center Drive would see extensive queuing. The unsignalized I-5 southbound ramp intersection with Mounts Road is expected to operate at LOS F.

2020 and 2040 transportation impacts and appropriate mitigation will be fully addressed in any future environmental analysis of a proposed build alternative in the South Study Area. Analysis will include future operational performance and safety, effect on local public or private (JBLM) roads, transit/TDM services, bicycles and pedestrians, and construction impacts.

### 5.3.2 Air Quality

The air quality assessment for improvements in the I-5 corridor in Pierce County focuses on transportation-related pollutants including carbon monoxide (CO) and Mobile Source Air Toxic Emissions (MSAT).

CO is a project level concern and emissions are primarily dependent on traffic volumes and levels of congestion. Section 176(c) of the Clean Air Act requires that transportation plans, programs and

projects conform to the intent of the state air quality implementation plan (SIP) for the on-going management of CO emissions.

Based on the process described in Section 4.4.1, three intersections in the South Study Area were initially identified as having the highest accumulated delay for entering vehicles, and thus the potential for generating the highest localized CO concentrations:

- ◆ I-5 southbound ramps at Nisqually-Mounts Road.
- ◆ I-5 southbound ramps at Steilacoom-DuPont Road.
- ◆ Steilacoom-DuPont Road, Barksdale Avenue and Wilmington Drive.

This list of potentially impacted intersections could change as a South Study Area build alternative is further defined.

With the 2020 and 2040 No Build Alternative, traffic congestion through the I-5 corridor and the interchanges in the vicinity of JBLM would continue to increase. Congested traffic could result in higher emissions of CO or MSAT pollutants than free-flowing traffic. Therefore, the No Build Alternative would be expected to result in more localized air pollution than the existing condition. However, changes in vehicle technology, fleet turnover, and improvements to fuels may offset the increased congestion with reduced emissions.

Potential South Study Area improvements along the I-5 mainline and at interchanges are intended to reduce congestion and are thus expected to improve localized air quality. 2020 and 2040 impacts with a build alternative will be fully evaluated in any future Air Quality Conformity Analysis to determine that the National Ambient Air Quality Standards (NAAQS) will not be exceeded as a result of these improvements. Impacts on MSAT will also be identified.

### 5.3.3 Noise

A traffic noise study was conducted along the entire project corridor (Gravelly Lake Drive on the north to Mounts Road on the south) using the FHWA Traffic Noise Model (TNM) version 2.5. The noise model was used to predict existing 2015, future 2040 Build and 2040 No Build Alternatives, and to identify future noise impacts. Traffic noise levels under the Build Alternative would result in a small increase of 1 to 2 dBA in noise levels compared to the No Build Alternative. These small changes are not perceptible to the human ear; therefore, any changes in sound level from the No Build Alternative to the Build Alternative would generally not be noticeable.

Noise sensitive receptors include residential development and a variety of non-residential land uses that could be impacted by highway noise such as parks and golf courses. In the South Study Area, noise sensitive receptors were identified on the west side of I-5 in the vicinity of the Steilacoom-DuPont Road interchange and on the east side between Center Drive and the Steilacoom-DuPont Road interchanges. Abatement in the form of noise walls was recommended at several locations in the Build Alternative area, but no noise wall locations were recommended within the South Study Area at this time. When a build alternative is defined for South Study Area, potential noise impacts associated with those improvements will need to be evaluated as part of future environmental analysis, and potential mitigation measures identified as necessary.

### 5.3.4 Geology and Soils

The nature and physical characteristics of the geology and soil types likely to be encountered in the Project corridor were assessed through a literature review of available, existing site data and two field reconnaissance site visits. Based on this assessment, it was determined that the majority of the study area is dominated by sand

and gravel outwash deposits left after glacial retreat about 13,500 years ago.

Man-made fill has also been imported and used in the construction of I-5, the I-5 on- and off-ramps, adjacent roads, and structures at the JBLM military complex. Additionally, peat, soft sediment (silt and clay), and recently deposited alluvial sand may be present in the vicinity of the Steilacoom-DuPont Road interchange. Potential geologic hazards that may affect improvements in the South Study Area include volcanic events, landslides, erosion, and seismic-related (earthquake) hazards such as ground shaking, fault-related ground rupture, and liquefaction.

Day-to-day operational effects, related to geology and soil associated with the No Build Alternative, are not anticipated. However, the existing overpass bridges and associated embankments and walls are aging and were not designed for the level of earthquake shaking required by modern standards. Therefore, there would be a greater risk of loss of functionality to these facilities due to seismic-related damage for the No Build Alternative.

Long-term geology and soil related impacts could occur along the proposed new I-5 roadway and interchange modifications within the South Study Area. Long-term operational impacts could include seismic-related instability and long-term settlement following placement of new fill over soft sediments and peat deposits. The extent of these effects would depend on final design and the mitigation alternatives implemented during construction to reduce these effects. Future improvements would be designed based on the available and project-specific subsurface information collected, design procedures and criteria approved by WSDOT, and the site conditions as they exist at the time of design and construction.

### 5.3.5 Water Resources

Water resources are sources of water which are or may be useful in supporting agriculture, industry, recreation, and human and ecological health. These sources are typically subdivided into two types: surface water and groundwater. Surface and groundwater interconnect with floodplains which are land areas whose surface is susceptible to being inundated by water from a nearby surface water source. Given the importance of these resources to human and ecological health, their use and maintenance are regulated at the federal, state, and local level in order to ensure they remain a beneficial resource for generations to come.

The study area for surface water includes Bell Marsh, a wetland and stream system that is located adjacent to and west of the Steilacoom-DuPont Road interchange (Exit 119). The floodplain associated with the Bell Marsh system is located within the city of DuPont. Bell Marsh and its associated floodplain may be impacted by potential improvements in the South Study Area. Red Salmon Creek is also located in the general vicinity and downstream of the South Study Area. Red Salmon Creek originates southwest of the I-5/Mounts Road interchange. Additional assessment of floodplain impacts may be required if future improvements are made in the study area within or tributary to Red Salmon Creek.

The study area for groundwater resources is located within the Central Pierce County Aquifer (sole source) and includes Wellhead Protection Areas in the vicinity of I-5. There are seven Group A wellheads in the vicinity of the Steilacoom-DuPont Road interchange, including one located immediately southeast of the existing interchange.

Long-term and operational effects resulting from potential improvements in the South Study Area may include increased runoff

due to increases in impervious areas, loss of floodplain storage, reduced channel and floodplain conveyance, and changes in infiltration capacity, thereby increasing river and stream channel flood flow rates and corresponding flood water surface elevations. Potential impacts to surface water, groundwater and floodplain resources associated with any future improvements will need to be evaluated as part of future environmental analysis and potential mitigation measures developed as necessary.

### 5.3.6 Wetlands

Wetlands are important to protect because they provide valuable ecological functions and help protect human communities. Wetlands are protected in the environment by wetland buffers, land encircling the wetland that helps separate the wetland from human disturbance. Local municipalities such as cities and counties typically regulate what activities can occur in wetland buffers, ensuring that buffers continue to provide protection to wetlands. Wetlands are also protected by Section 401 and 404 of the federal Clean Water Act, as well as regulations at the state level. Wetlands are rated by their function and value from Category I (highest value) to Category IV (lowest value and/or most disturbed).

Within the South Study Area, wetlands have been identified west of I-5, adjacent to Steilacoom-DuPont Road. These wetlands include Bell Marsh, a Category I wetland associated with an un-named stream, as well as several Category III wetlands located within topographic depressions. Bell Marsh and two of the depressional wetlands are in close proximity to the original relocated Steilacoom-DuPont Road interchange design concept.

Additional field investigation of potential wetlands in the vicinity of the Center Drive interchange may be required if future improvements are made in this area. Potential wetland impacts in this area will need

to be evaluated and an associated mitigation strategy may need to be developed as part of future environmental analysis.

### 5.3.7 Fish, Vegetation and Wildlife

Fish, vegetation and wildlife communities were identified and evaluated through the Project corridor to determine whether there were any potential impacts. Analysis focused on mapping and characterizing habitat, and evaluating the potential for fish, wildlife and vegetation to be present.

Habitat in the study area is typically a mosaic of isolated fragments including primarily second-growth forest, open grassy areas, and wetlands. Except for wetlands, habitat is suitable primarily for species with high tolerances for noise and human activity, or species that are attracted by the byproducts of development. Wildlife likely to be observed in terrestrial habitats in the South Study Area includes, but is not limited to, birds, squirrels and other rodents, deer, raccoons, opossum, coyotes, and feral cats and dogs. Wetland habitats contain a variety of amphibian species: red-legged frog, northwestern salamander, and long-toed salamander were observed in several of the wetlands during site visits.

Based on initial analysis, no federally-listed fish or fish habitat was identified in the South Study Area. The potential for listed mammals (Roy Prairie pocket gopher) and listed or priority plants (water Howellia, white-top aster, Torrey's peavine) to be in a future potential disturbance footprint is low, but still possible. Numerous migratory bird species have been identified through sightings, particularly in the vicinity of Eagles Pride Golf Course and Mounts Road, Sellars Lake, MacKay Marsh, Edmond Marsh, and in and near the Nisqually National Wildlife Refuge.



Potential impacts to fish, vegetation and wildlife resources associated with proposed future improvements will need to be evaluated as part of future environmental analysis. Potential effects of improvements in the South Study Area could include:

- ◆ Physical disturbance of sensitive species or occupied habitat.
- ◆ Permanent vegetation clearing or temporary clearing during construction.
- ◆ Permanent and temporary wetland alterations (fill, clearing).
- ◆ Permanent and temporary stream and wetland buffer alteration.
- ◆ Elevated noise and visual disturbance during construction.
- ◆ Increased volumes or reduced water quality of stormwater discharges into surface waters.

A variety of minimization measures could be implemented to reduce potential construction and permanent effects. It is recommended that additional surveys for the Roy Prairie pocket gopher, water Howellia, Torrey's peavine, and white-top aster should be completed in potentially suitable habitat areas once a build alternative is selected in the South Study Area. Impacts to wetlands and wetland buffers would be mitigated as required. Short- and long-term stormwater management would be conducted consistent with the WSDOT *Highway Runoff Manual*.

### 5.3.8 Hazardous Materials

Existing and potential locations where hazardous materials are or may be present in the Project corridor were identified and evaluated to assess their potential impact on the proposed Project. Within the South Study Area, a total of ten sites of concern that have or may have soil and/or groundwater contamination were identified. Of the ten sites, two are considered to have a potential moderate risk and

the remaining eight sites are considered to have a potential low risk. These sites included:

- ◆ An above ground storage tank located adjacent to the southbound Steilacoom-DuPont Road exit from I-5.
- ◆ Up to three former Underground Storage Tank (UST) sites are located south-southeast of the northbound Steilacoom-DuPont Road exit from I-5 on JBLM property. Two of the sites were issued No Further Action opinions from DOE. Residual contamination associated with the former UST is present in both soil and groundwater at the third site.
- ◆ One currently active and one former service station are both located south and west of the I-5/Steilacoom-DuPont Road interchange.
- ◆ A former landfill located within and east of the I-5 corridor at the Center Drive interchange. The landfill was used for disposal of vegetation and municipal/medical waste. Approximately five acres (northwest portion) of the approximately 15-acre landfill are located within an I-5 easement and are documented to have been remediated. Additional mitigation at this location may be necessary as part of any future improvements in the vicinity of the I-5/Center Drive interchange.
- ◆ An existing dry cleaning business located on the west side of I-5 at the Center Drive interchange.
- ◆ A former landfill site located within and west of the I-5 corridor at the Center Drive interchange.
- ◆ Another former landfill is located east of and directly adjacent to the I-5 south of the Center Drive interchange.

Hazardous materials impacts and/or appropriate mitigation associated with any future improvements in the South Study Area will

need to be evaluated as part of future environmental analysis and potential mitigation measures developed as necessary.

### 5.3.9 Visual Quality

A visual impact assessment was prepared to identify potential visual impacts of proposed improvements in the Project corridor, including possible impacts in the South Study Area. The assessment focused primarily on the I-5 interchange at Steilacoom-DuPont Road (Exit 119). The visual character of this interchange is dominated by JBLM to the east and the city of DuPont to the west. On the east side, the view is dominated by JBLM colonial style military housing with associated office and training facilities. In the background, the view is forested with Mount Rainier serving as the focal point. To the west the city of DuPont dominates the landscape view with the Sound Transit railroad dividing I-5 from businesses.

The visual character of the area would be changed by the additional height of future new interchanges if they are designed to provide grade-separation from the railroad. The most sought out view in the area is Mount Rainier to the east. Most viewers using I-5 would be focused on the roadway due to traffic and speed.

Visual impacts associated with any modifications to interchanges as part of future improvements in the South Study Area will need to be assessed once a build alternative is selected.

### 5.3.10 Archaeological and Historical Resources

The Project is subject to approval by the FHWA, and as such must be conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA). This act requires an assessment of potential project-related impacts to historic resources, archaeological sites, and

traditional cultural properties. Consultation with stakeholders to find acceptable ways to avoid, minimize, or mitigate adverse effects is also required.

Within the South Study Area, the presence of cultural and/or historic resources is largely concentrated in the vicinity of the Steilacoom-DuPont Road interchange (Exit 119). Properties eligible for listing on the National Register of Historic Places (NRHP) include:

- ◆ Quartermaster Gasoline Filling Station/Stone Station located to the east of the interchange.
- ◆ A warehouse on West Way located to the east of the interchange.
- ◆ The American National Red Cross Field Office/Lewis Community Spouse's Club located northeast of the interchange.

Additionally, the Fort Lewis Garrison Historic District (designated on the NRHP in 2004) is located north and east of the interchange area and the DuPont Village Historic District is located west of the interchange. The effect of future improvements on these facilities will need to be further considered in the development of a build alternative for the South Study Area. [A project specific Programmatic Agreement was executed on May 17, 2017 which stipulates future Section 106 consultation steps to be taken as the South Study Area APE becomes further defined.](#)

### 5.3.11 Section 4(f) Resources

Section 4(f) refers to a section of the Department of Transportation Act of 1966 which stipulates U.S. Department of Transportation (DOT) agencies cannot approve the use of land for transportation projects from publicly owned parks, recreational areas, wildlife and waterfowl

refuges, or public and private historical sites unless the following conditions apply:

1. There is no feasible and prudent alternative to the use of land from the property.
2. The action includes all possible planning to minimize harm to the property resulting from such use.

Historic and archaeological resources were identified and evaluated within the Project's Area of Potential Effect (APE), while public recreational properties, including parks, public schools and wildlife refuges, were evaluated within a ½ mile of I-5 in the South Study Area.

Seventeen Section 4(f) resources were identified in the vicinity of the South Study Area including: three historic properties and two historic districts (as described under section 5.3.10 above); Chloe Elementary School located in the city of DuPont; eight parks in DuPont (Ross, Clocktower, Sellers, Iafrati, Lumsdon, Bell Hill Neighborhood, Bell Hill Community and Robinson); a variety of DuPont trails; the DuPont Community Center; and the Eagle's Pride Golf Course.

It is not anticipated that future improvements would result in an adverse impact to any of the historic properties, historic districts, parks or recreational resources identified on the basis of an initial assessment. The effect of future improvements on these facilities will need to be further considered in the development of a build alternative for the South Study Area.

### 5.3.12 Socioeconomics and Environmental Justice

The assessment of socioeconomic and environmental justice (EJ) issues in the Project corridor addresses potential adverse impacts or benefits to the human environment, such as housing, social resources, community resources, economic conditions, and aesthetic conditions.

The EJ analysis was conducted to determine if public involvement has been inclusive of minority and low-income persons, and if potential impacts are disproportionately burdensome to those populations.

To conduct this analysis, demographic data has been mapped and potential impact areas identified. Within the South Study Area, the Pierce County Public Library in DuPont is a key community resource. DuPont is also home to many large employers and is directly adjacent to one of Washington State's largest employers, JBLM. The South Study Area includes a high percentage of rental housing on JBLM and within DuPont near the Steilacoom-DuPont Road interchange (Exit 119). There is a lower percentage of low-income persons, Hispanic persons, and minorities in the South Study Area than in the northern portion of the corridor in the Tillicum and Woodbrook neighborhoods.

The social and economic aspects of reducing congestion on I-5 and connecting roads would benefit the entire Project corridor area. Area residents and employees who travel on I-5 would benefit from reduced delay, as would those traveling through the area to other destinations. Development of potential future improvements in the South Study Area, especially interchanges, should address any potential property acquisitions or displacements and/or any other potential social, economic, or other EJ impacts.

### 5.3.13 Land Use

Land use within the South Study Area is characterized by a mix of urbanizing residential and commercial land uses, as well as extensive military lands that are part of JBLM. JBLM currently hosts more than 40,000 active duty military service members, 14,000 civilian employees, and 60,000 military family members. The size, population, and services offered on JBLM make it comparable to a fully-functioning city. While most of JBLM is composed of open range

lands for military maneuvers and training, an extensive network of urban services such as military offices, residential areas, schools, Madigan Army Medical Center, fire stations, and other operational support features are located close to I-5.

Much of the South Study Area on the west side of I-5 is located in the city of DuPont. This historic community was incorporated in 1951. The land area in DuPont is composed of residential areas, business/industrial areas, and open space. While residential areas currently make up the majority of the developed areas, the city has large land areas designated for future commercial and business/industrial development. Three I-5 interchanges serve DuPont:

- ◆ Exit 119 (Steilacoom-DuPont Road).
- ◆ Exit 118 (Center Drive).
- ◆ Exit 116 (Mounts Road).

The City of DuPont's *Comprehensive Plan* sets forth the goals and policies for the city's future development. These goals and policies are reflected throughout the city's other planning documents, as well as in the zoning ordinance. Future land use in the study area is envisioned to be primarily a combination of commercial, office, and mixed-use, with some residential and open space designation. The *Comprehensive Plan's* transportation project list also includes the Steilacoom-DuPont Road interchange (Exit 119), with the project description, "Construct new interchange to add capacity."

Generally, improvements to the I-5 corridor within the South Study Area would be consistent with currently adopted plans and policies at the local, regional, and state levels, as these improvements would provide relief to worsening congestion problems on I-5 and its key

interchanges. Access to one of JBLM's busiest access control points, the DuPont Gate, may also be improved consistent with JBLM's security objectives. The potential impacts on the I-5 interchanges at Steilacoom-DuPont Road (Exit 119) and Center Drive (Exit 118) to property acquisition and future land development will be addressed in future environmental analysis as design concepts in the South Study Area become more refined.

### 5.3.14 Utilities

Numerous utilities and stakes marking utilities were observed at the interchanges along I-5 in the South Study Area. The utilities include buried fiber optic cables, telephone, ITS, stormwater, overhead lines and others. Many of these utilities will need to be considered for relocation during design and construction. Potential impacts of future improvements on utilities will be further addressed in future environmental analysis.

### 5.3.15 Indirect Effects

When improvements become further refined and a build alternative is identified for the South Study Area, a detailed environmental evaluation of indirect effects will be conducted. Cumulative effects were considered across the entire corridor (see Section 4.18-3 - 4.18-7). Historical trends reasonably foreseeable future actions, and climate change risks in the South Study Area were considered. The cumulative effects section may be updated following the detailed analysis of potential direct effects as needed.

## 5.4 PUBLIC REVIEW OF CORRIDOR LEVEL ELEMENTS

Review of potential future improvements in the South Study Area have been and will continue to be reviewed by Project stakeholders and the general public. Recent and upcoming meetings to inform the community and solicit input on Project elements include:

- ♦ **January 19, 2016** DuPont City Council Work Session – An update was held to discuss JBLM’s request to consider moving the location of the DuPont ACP and the resulting EA revisions for both the North Study Area Build Alternative and South Study Area elements.
- ♦ **April 18, 2016** DuPont City Council Work Session – A follow up discussion was held to address next steps in determining a build alternative for the South Study Area and the results of initial modeling of JBLM’s proposal to relocate the DuPont Gate to the Center Drive interchange.
- ♦ **May 4, 2016** Tillicum Community – Meeting was held to brief and receive input from residents, property owners and business owners on Project status.
- ♦ **May 23, 2016** DuPont Community – Meeting was held to brief and receive input from residents, property, owners and business owners on Project status.
- ♦ **September 2016** Public Open House and Public Hearing.

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