



Evaluation of Local Transportation Impacts in the Vicinity of JBLM

Technical Report

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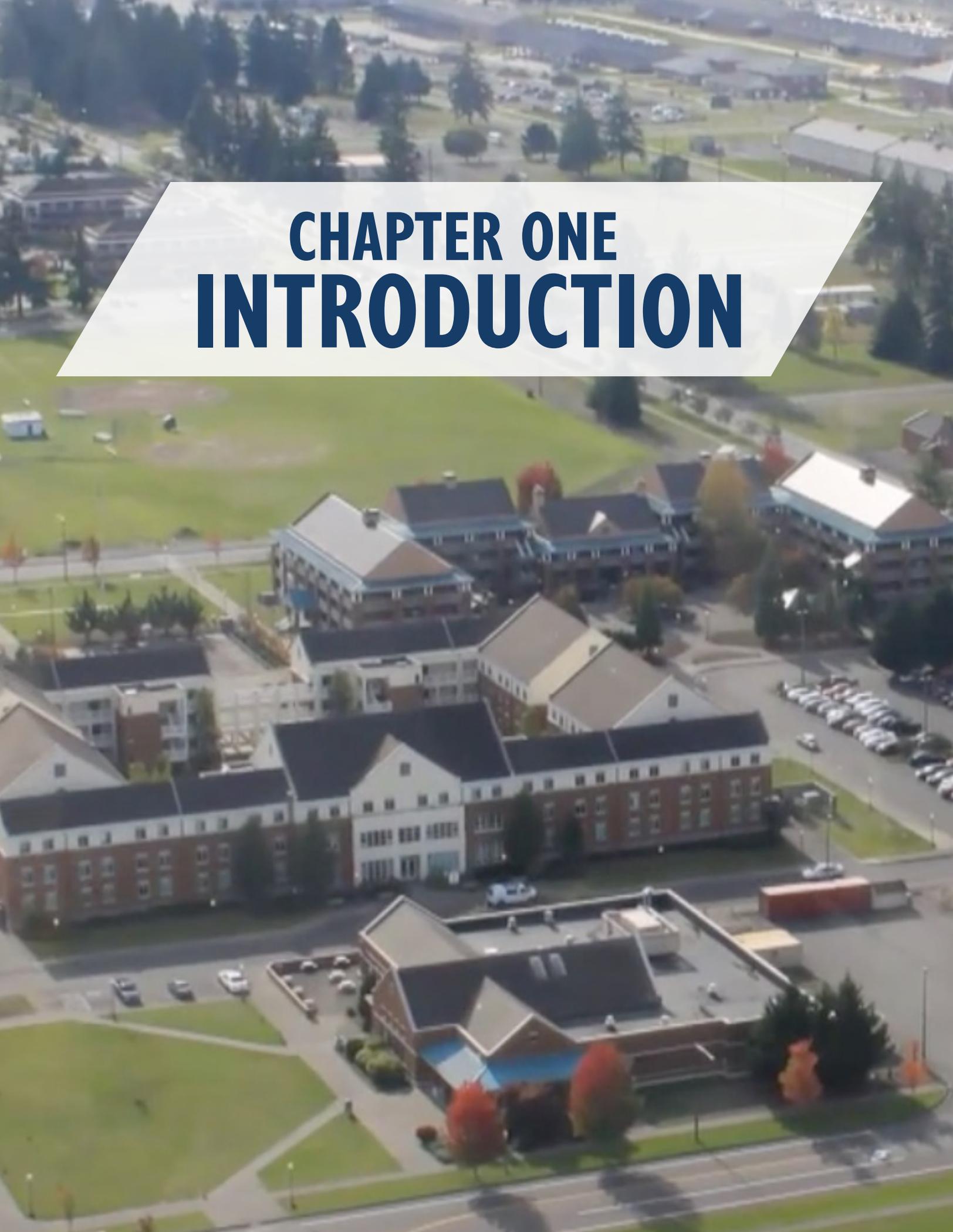
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An aerial photograph of a school campus. The image shows several large, multi-story brick buildings with dark roofs, interspersed with green lawns and trees. A large white banner with a blue border is positioned across the top half of the image, containing the text 'CHAPTER ONE INTRODUCTION'. The background shows a residential area with houses and streets.

CHAPTER ONE INTRODUCTION

THIS REPORT documents the analysis process, findings, conclusions, and recommendations of a study to improve access to Joint Base Lewis McChord (JBLM) in southern Pierce County, Washington. Over the past several years, considerable attention has been paid to improving traffic operations and safety along the I-5 corridor through this portion of the County. The primary objective of this effort has been to improve mobility and safety for all highway users including employees and visitors to JBLM. Specific improvement recommendations have been identified and are in the initial stages of design and construction with phased opening scheduled for late 2020/early 2021 and for 2024/2025.

In addition to the substantial improvements underway along I-5, local and state agencies have identified a wide variety of improvements to local streets and arterial state highways that can also enhance access to JBLM. Many of these improvements are contained within the Transportation Plans or Transportation Improvement Programs of these agencies. The focus of this study has been on building on this available information to identify a prioritized program of arterial street and highway improvements that are focused on enhancing both the mobility and safety of JBLM access.

This chapter outlines the goals and objectives of this study based on project understanding and guidance from South Sound Military and Communities Partnership (SSMCP) staff. Study methods and assumptions are also described including project purpose and need, a definition of the study area, study methodology, and an introduction to the evaluation criteria used to screen and prioritize project recommendations.

Project Purpose

This project will recommend and prioritize projects, programs, and policies that improve access to Joint Base Lewis-McChord (JBLM) in order to maintain a safe and reliable transportation system both on- and off-base.

The project will evaluate the existing and forecast conditions of the transportation network, focusing on key corridors that provide access to the installation, to develop an action plan that:



SUPPORTS the transportation needs of the JBLM workforce



INCREASES state and local roadway network efficiency



IMPROVES mobility of people and goods in the area



EXPANDS transportation choices



ENHANCES system safety and operations



ENRICHES the region's economy, environment, and overall quality of life

PROJECT NEED

Over the past several years, traffic has increased along the I-5 corridor in the vicinity of JBLM as a result of commuter trip growth between Thurston, Pierce and King Counties, and sustained community development in Lakewood, DuPont and Steilacoom. Because of the presence of secure military bases on both sides of I-5, there are no routes for motorists to use for travel between the Seattle/Tacoma area and Olympia without extended detours to bypass these bases. As a result, congestion along this segment of I-5 has become a daily occurrence and interchange ramp traffic backing onto the I-5 mainline is causing delays and safety issues.

The local road networks around JBLM have also seen traffic volumes increases due to commuter traffic growth on I-5 and community development. Additionally, both I-5 and the local street network are impacted by the magnitude of traffic activity entering and leaving JBLM on a daily basis. JBLM has become the largest military installation on the West Coast comprising over 90,000 acres. It is also the second largest employer in Washington State with 52,000 personnel and the largest at a single location. When you add dependents (45,000) and retirees (32,000) the population served by JBLM is almost 130,000.

According to JBLM traffic monitoring devices, in 2018 about 57,000 vehicles per day routinely entered the installation during the work week

through the nineteen active Access Control Points (ACPs). This entering volume should be doubled to account for vehicles exiting these same ACPs, bringing the total to well over 100,000 daily trips.

For the past seven years, traffic congestion has been the number one concern of military employees living in the area. According to a 2018 SSMCP survey of the JBLM workforce, 71 percent of active duty service members lived off-base and commuted to work. If Department of Defense (DOD) civilian personnel were added, 87 percent of the JBLM workforce lived off-base. With so much of the JBLM workforce living off-base, mission readiness can be severely impacted when roadways become impassible or heavily congested.

The State of Washington has recognized traffic volumes are negatively impacting commerce in the region and has focused some highway construction effort along the JBLM corridor on I-5. The state-funded JBLM Congestion Relief Project working to alleviate some of the congestion on the nearly eight-mile stretch of I-5 that bisects JBLM. However, the work on I-5 will not address the arterial road network which will continue to be a problem.

Washington State's Growth Management Act and associated long-range planning processes requires local jurisdictions to regularly assess their existing and emerging transportation needs and prepare a list of projects, programs, and policies that address those needs. For the purposes of this project, the capital investment programs (CIPs) and transportation improvement programs (TIPs) developed by local agencies serve as a starting place for documenting transportation needs in the region. The selection process will determine which of the projects, programs, and policies identified in the local plans also address the growing need for the JBLM workforce to travel on a safe, reliable, and efficient transportation network.

STAKEHOLDER OUTREACH

The stakeholder outreach process includes evaluating existing programs, policies, and projects based on feedback from local agencies and groups. The stakeholder outreach effort was anchored by the Transportation Working Group, a committee of transportation professionals from SSMCP member



Gate congestion at JBLM



Signing Ceremony for SB5748 - bill to fund infrastructure around JBLM

agencies who met bi-monthly to establish project screening metrics, prioritize projects and to help guide the project and make recommendations to the SSMCP Executive Leadership Team and Steering Committee. One-on-one interviews were also conducted with agency technical staff in order to gather project lists, determine JBLM access priorities, and coordinate with installation leadership. This section identifies the stakeholders involved and summarizes the outreach process and major themes heard during stakeholder interviews.

Stakeholders

Local agencies involved in the stakeholder outreach process include cities, counties, transit agencies, and other groups locally connected with the JBLM study area that have a particular interest in the transportation system.

STAKEHOLDERS INCLUDED:

- Washington State Department of Transportation (WSDOT)
- Pierce Transit
- City of Roy
- City of Tacoma
- Joint Base Lewis-McChord
- InterCity Transit
- City of Yelm
- Thurston County
- Washington National Guard
- Sound Transit
- City of Lacey
- Pierce County
- Puget Sound Regional Council
- City of Lakewood
- City of University Place
- Nisqually Indian Tribe
- Thurston Regional Planning Council (TRPC)
- City of DuPont
- Town of Steilacoom
- Clover Park School District

Outreach Process

The outreach process included identifying challenges and areas for improvement in local transportation systems. Stakeholders were asked to identify potential projects that could alleviate traffic obstacles in the JBLM region. Outreach questions included:

- What local transportation challenges is your jurisdiction or agency currently facing? To what extent are these challenges related to JBLM traffic?
- What local projects, either on or off your TIP or CIP, would you like included in the project list for further investigation?
- Thinking beyond your specific jurisdiction, what single project or series of projects would make a significant improvement to mobility in the region?

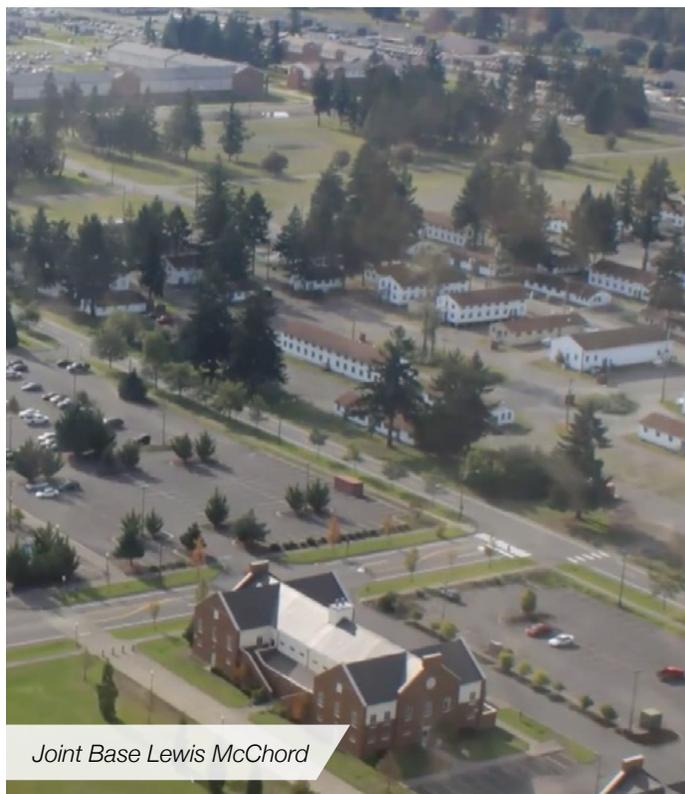
 Detailed communications plans used in the stakeholder outreach process are included in Appendix A.

Interview Findings

Based on conversations with agencies and jurisdictions, the following conclusions emerged as commonalities among the stakeholder groups:

- Look for east-west connections between eastern Pierce County, I-5, and JBLM
- Bridges across the Nisqually River (I-5 and SR 507) are a choke point
- Housing availability will impact where future workforce is accessing the base
- Look for strategies that have multiple community-wide benefits that are not driven by a specific development need
- Ensure solutions consider safety and not just congestion
- Many lower-cost projects are not well suited for federal funding due to administration costs
- Robust transit inside the base will support mass transit outside the base
- Future transit options include first- and last-mile on-demand rides, future light rail stations, and bus rapid transit

 Detailed stakeholder notes are included in Appendix B.

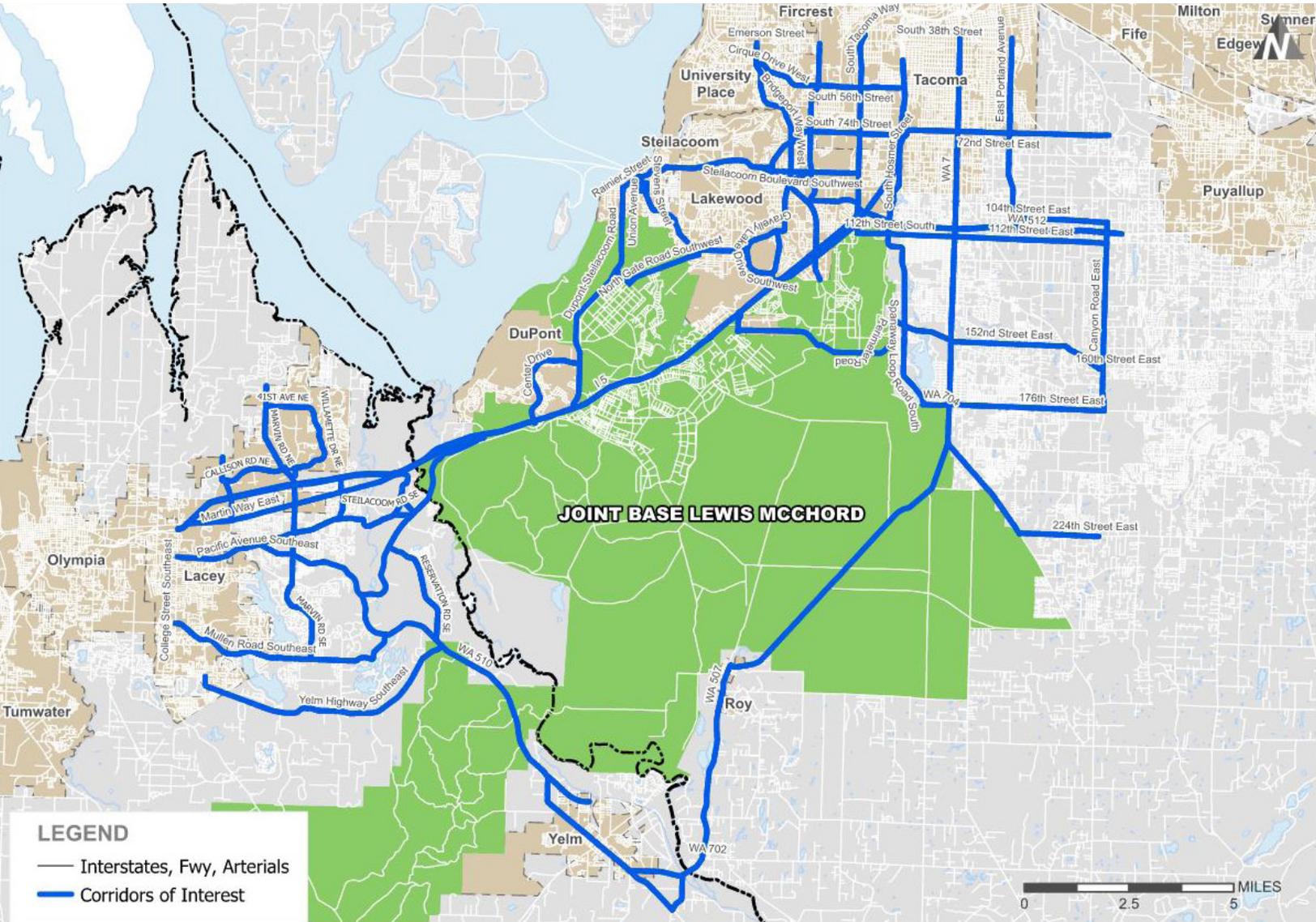


STUDY AREA

The study area includes major portions of Pierce and Thurston County. The area is generally bound by S 56th Street in Tacoma to the north, Canyon Road E to the east, and SR 507 in Roy to the south in Pierce County. In Thurston County, the study area is bound by College Street SE in Lacey to the west and SR 510 in Yelm to the south. The study area and corridors of interest are shown in Figure 1.

The study area was based on a general 5-mile radius of the JBLM boundary and was refined based on existing major travel patterns in the area. StreetLight data was obtained to understand origins and destinations of trips that have one trip end within JBLM. StreetLight uses fleet and cellular data sets to anonymously compile past and current trip making patterns. Based on the AM and PM peak hour distribution of JBLM trips, and the functional classification of area streets and highways, corridors of interest were selected as illustrated in Figure 1.

Figure 1. Study Area and Corridors of Interest



STUDY METHODOLOGY

This section outlines study assumptions and analysis methodology. This includes analysis years and time periods, the transportation modeling tools used in evaluation, traffic analysis methods, infrastructure assumptions such as planned network improvements, and safety analysis methods.

Analysis Years and Analysis Periods

Recognizing that a 20-year outlook is appropriate for evaluating long-term transportation needs and improvements, the 2040 horizon year was selected as the horizon year in which to evaluate the future transportation needs. 2040 is consistent

with the currently available modeling data including the regional travel demand models used by the Puget Sound Regional Council (PSRC) and the Thurston Regional Planning Council (TRPC).

Transportation Modeling Tools

Transportation models are used to project future traffic volumes and assess future conditions on the transportation network. These models are often maintained and updated on a regular basis to keep them consistent with local and regional land use plans and on-going changes to the transportation system. Using transportation modeling tools in this study allowed the project screening process to be sensitive to existing or anticipated congestion problems, regional travel patterns, and the impacts of network improvements outside of the immediate project area.

Typical outputs from the transportation model include, but are not limited to, forecasted traffic volumes, vehicle delay, and congested speeds along specific roadway segments. This information was used to support the evaluation of improvement options based on mobility metrics that allowed an apple-to-apple comparison across different scenarios.

Table 1 summarizes characteristics of modeling tools available in the region, including advantages and challenges associated with using them in support of this project.

Due to the importance of reflecting military and installation related trips in both Pierce and Thurston Counties, the I-5 JBLM model was utilized for a majority of the project screening process. Where more detailed Thurston County information was needed, the TRPC was used to supplement the information from the I-5 JBLM model.

Screening and Evaluation Process Overview

A detailed screening process was developed and utilized to identify a recommended set of projects to improve access to JBLM. Chapter 4 provides a more detailed discussion of the identification and screening of projects. Initial project lists were developed through review of 38 separate planning documents available from 15 individual agencies. Documents included agency Transportation Plans, Transportation Studies, 6-Year Transportation Improvement and Capital Improvement Plans (TIPs and CIPs), and Transportation Development Plans.

Based on a review of the planning documents, a project list was compiled of 151 possible projects. Project types included Capital Infrastructure Projects, Public Transportation Projects, Transportation Studies, and Travel Demand Management Strategies. The project list included a detailed review of each project's limits, description, type, cost estimate, funding status, lead agency, potential funding partners, estimated construction year, and a determination as to whether the project was located along a study corridor in the vicinity of JBLM. After developing an overall list of possible projects, evaluation criteria and a multistep prioritization process were developed to identify the projects best suited for implementation.

Table 1. Characteristics of Existing Travel Demand Models in the Region

MODEL	ADVANTAGES	CHALLENGES
I-5 JBLM	Specifically designed with JBLM military trips in mind. Includes on-base roadways. Includes Thurston County trips and most of Pierce County. Updated to reflect I-5 improvements.	Does not directly model transit trips, but can estimate transit related impacts. Not an agency maintained model.
PSRC	Multimodal model that reflects Pierce, King, Snohomish, and Kitsap Counties.	Does not address Thurston County trips very well. Missing specific details about military-trip behavior and on-base roadway infrastructure.
TRPC	Reflects Thurston County and a portion of Pierce County.	Missing specific details about military-trip behavior.
Pierce County	Reflects Pierce County roadways in a detailed way.	Does not address Thurston County trips very well. Missing specific details about military-trip behavior.



**THIS EFFORT RECOMMENDS AND
PRIORITIZES PROJECTS, PROGRAMS,
AND POLICIES THAT IMPROVE ACCESS
TO JBLM AND MAINTAIN A SAFE AND
RELIABLE TRANSPORTATION SYSTEM
BOTH ON- AND OFF-BASE.**

CHAPTER TWO EXISTING CONDITIONS



THIS CHAPTER

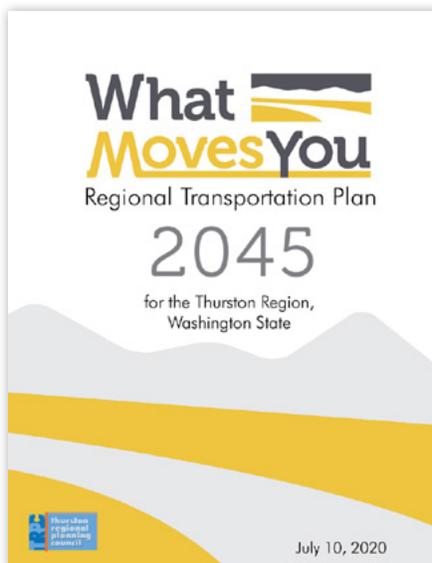
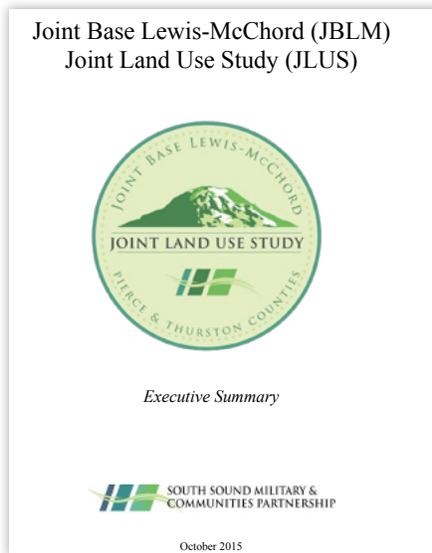
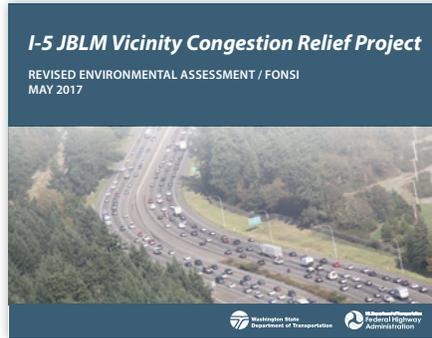
describes the transportation system and outlines baseline transportation conditions in the communities surrounding JBLM. It includes an overview of relevant studies and plans and provides a synopsis of the major transportation facilities in the study area that offer access to/from JBLM.

BACKGROUND STUDIES

Several studies were identified and reviewed as a starting point to document existing study area transportation conditions and respective long-term plans.



Existing studies and plans are summarized in Table 2 and a detailed list of planned transportation projects is included in Appendix C.



Background studies included (clockwise from top right) JBLM Congestion Relief Study, JBLM Growth Coordination Plan, JBLM Joint Land Use Study, PSRC Regional Transportation Plan, and Thurston County Regional Transportation Plan

Table 2. Summary of Existing Studies and Plans

RELEVANT STUDIES AND PLANS	MAJOR OUTCOMES/RELEVANCY TO JBLM
<p>JBLM Joint Land Use Study</p>	<p>The study conducted quantitative and qualitative analyses to identify existing or potential land use incompatibilities between JBLM and neighboring communities. Strategies were developed to address the incompatibilities.</p>
<p>JBLM Growth Coordination Plan</p>	<p>The Plan was developed to explore impacts and opportunities related to JBLM growth and to provide recommendations for leveraging those opportunities and improving support of military personnel in the region.</p>
<p>I-5 JBLM Congestion Relief Study</p>	<p>The study was developed in three phases, including a corridor feasibility study, a multimodal corridor alternative analysis, and design and environmental documentation of recommended improvements. The study included an origin-destination study, and extensive travel modeling for improvement alternatives. The following projects were identified:</p> <ul style="list-style-type: none"> • Rebuilding the Thorne Lane interchange. • Rebuilding the Berkeley Street interchange. • Rebuilding the Steilacoom-DuPont Road interchange. • Add one lane to each direction of I-5 from Thorne Lane to the vicinity of Center Drive with auxiliary lanes in selected locations • Gravelly-Thorne Connector multi-use path. • Bike/Pedestrian path along the I-5 corridor. <p>A proposed Future Phase includes:</p> <ul style="list-style-type: none"> • An additional lane to each direction of I-5 for a total of five lanes in each direction plus auxiliary lanes. • Revisions to the Main Gate interchange
<p>PSRC Regional Transportation Plan</p>	<p>PSRC Regional Transportation Plan outlines how the region intends to meet its future transportation needs as associated with expected regional growth, and identifies actions that will improve the region’s mobility through a long list of transportation infrastructure investments.</p> <p>The Key investments related to JBLM access include:</p> <ul style="list-style-type: none"> • WSDOT I-5 JBLM: DuPont-Steilacoom Rd to Thorne Lane (2021) • WSDOT I-5 JBLM: Mounts Rd to DuPont-Steilacoom Rd (2024) • Pierce Transit – Pacific Avenue S/SR 7 Corridor from Downtown Tacoma to Spanaway (2022)
<p>TRPC Regional Transportation Plan</p>	<p>TRPC Regional Transportation Plan is a strategic document that addresses the future needs of the Thurston County region and identifies future transportation system improvements.</p>

DATA SOURCES

The assessment of existing transportation conditions was based on review of the planning documents outlined in the previous section, as well as data assembled from each of the agencies within the study area. In addition, third-party data sources such as StreetLight Data and Google Maps were used to better understand JBLM-related travel patterns, existing system-level performance measures, and transportation issues in the study area. Table 3 summarizes the transportation data collected for this effort and identifies the agencies that provided the data.

ASSESSMENT OF THE TRANSPORTATION SYSTEM

Access to JBLM is provided by a series of regional roadways that include State highways, County arterials, and City streets. Due to the size of JBLM, the roadway facilities are maintained and operated by over 10 different transportation departments serving a variety of agencies. This section identifies the major roadway facilities in the project study area, their functional classification, and includes an inventory of average peak hour congestion levels along the key study area corridors.

Functional Classification

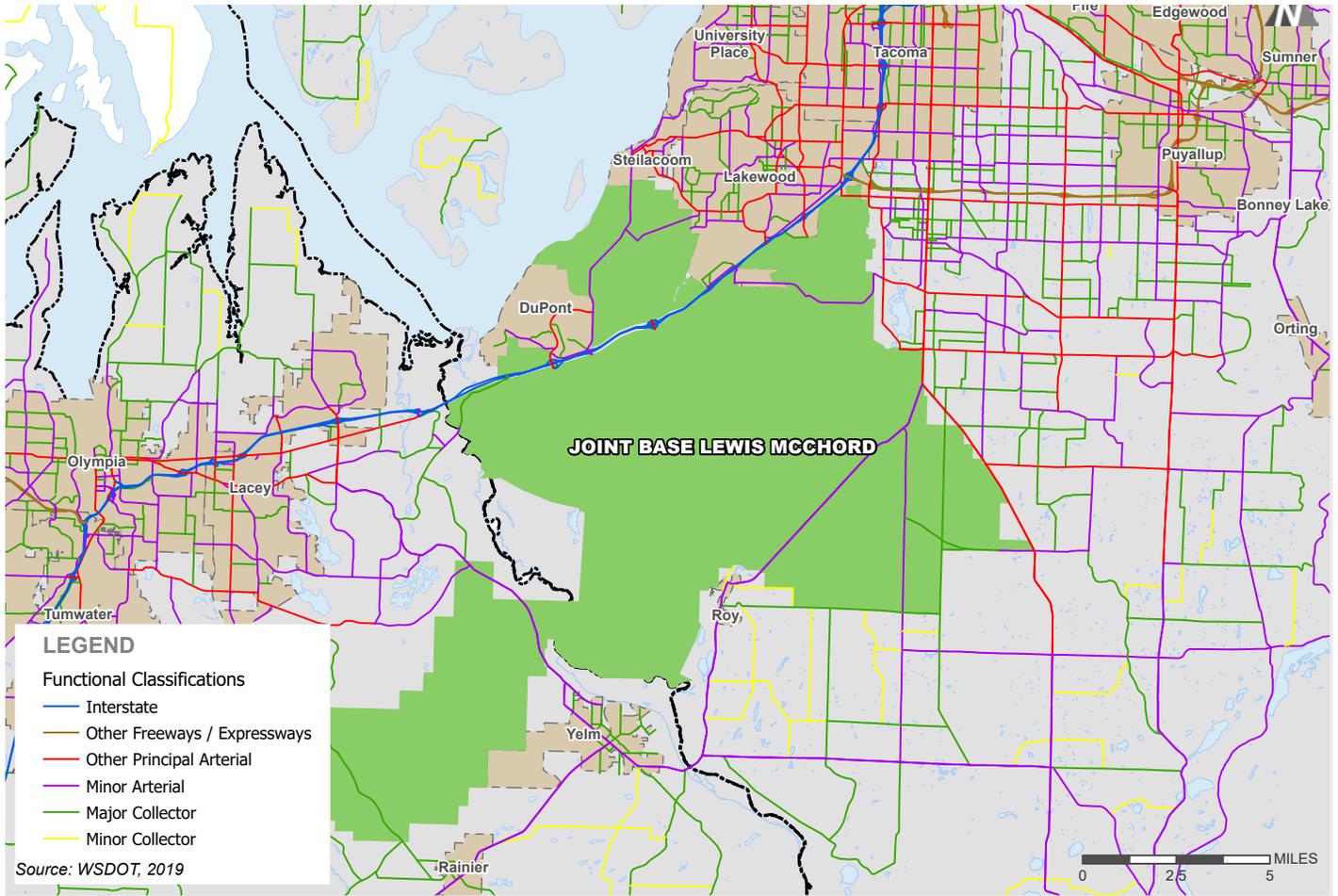
Functional classification is the grouping of highways, roads, and streets that serve similar functions into distinct systems or classes within the total existing or future roadway network. The objective of functional classification is to define the appropriate role of a road (i.e., mobility versus access) in providing transportation service and influencing land development patterns. Roads with a higher functional classification typically provide for higher volume and higher speed mobility, serve long distance travel, and place less emphasis on local property access. Roads with lower functional classifications provide for a balance of mobility and access or (in the case of local streets) serve a largely property-access function.

In general, the functional classification is used by most of the agencies surrounding JBLM and includes such categories as state highway, principal arterial, minor arterial, collector, and local street. Figure 2 shows the functional classification of the major roadways within study area and is based on the most current version of the Federal Classification Map maintained by WSDOT. The following section summarizes the characteristics of various roadway functional classifications.

Table 3. Transportation Data Summary

DATA	AGENCY
Functional Classification	WSDOT, 2019
Transit Services and Facilities	<ul style="list-style-type: none"> • Pierce Transit • InterCity Transit • Sound Transit • Go Transit (JBLM)
Access Control Points (Gates) Counts	<ul style="list-style-type: none"> • JBLM • City of Lakewood
Key Bottlenecks and Travel Times	Google Maps
Origin – Destination Travel Patterns to/from JBLM	StreetLight Data

Figure 2. Roadway Functional Classification



Interstate Highway

Interstates provide the highest level of mobility and the highest speeds over the longest uninterrupted distance. The major Interstate facility within close proximity to JBLM is Interstate 5 (I-5). I-5 is one of the major interstates running in a generally north-south direction from Canada to Mexico. I-5 borders JBLM for approximately 11 miles with a total of nine interchanges that provide access to/from JBLM. I-5 has three travel lanes in each direction between Martin Way and Nisqually Road SW, and between Steilacoom-DuPont Road and Berkeley Street. The remaining segments of I-5 bordering JBLM have four travel lanes in each direction.

I-5 is designated as a National Highway System (NHS) route and supports the United States strategic defense policy by connecting JBLM and Camp Murray with major population centers, international border crossings, ports, airports,

public transportation facilities, and other intermodal transportation facilities. Designation as an NHS route influences the level of design standards applied to a route and establishes greater opportunities for federal funding of transportation improvements.

Freeway Expressway

Located north of McChord Air Force Base, SR 512 is classified as “other freeway expressway”. Similar to an Interstate highway, these roadways maximize mobility with a limited number of at-grade intersections. SR 512 provides an east-west connection between JBLM and the communities to the east including Puyallup, Parkland, Allison and Sumner. SR 512 has three to four travel lanes in each direction between I-5 and SR 7. From SR 7 east, SR 512 narrows to two travel lanes in each direction.

Principal Arterial

Several County and City principal arterials also provide direct access to JBLM. Principal Arterials provide a high degree of mobility to connect JBLM with major metropolitan centers like Tacoma, Lakewood, and DuPont, as well as some rural areas.

Minor Arterial

Several Minor Arterials provide direct or primary access to and from JBLM and include Steilacoom-DuPont Road SW, Perimeter Road, and SR 507. Usually, Minor Arterials provide connections to smaller geographic areas than roads with higher classifications. For instance, Steilacoom-DuPont Road SW is a minor arterial connecting the City of DuPont with the Town of Steilacoom and provides access to JBLM's DuPont and Integrity gates.

Table 4 summarizes key principal and minor arterials within the study area.

Table 4. Study Area Key Arterials

ROADWAY NAME	APPROXIMATE EXTENTS
Lakewood	
Gravelly Lake Drive SW	Bridgeport Way West to I-5
Steilacoom Boulevard	Rainier Street to S Tacoma Way
S 74th Street	Steilacoom Boulevard to Canyon Road E
Bridgeport Way W	Emerson Street to Gravelly Lake Drive
150th Street SW	Murray Road to Perimeter Road
South Tacoma Way	S 38th Street to I-5
Tacoma	
72nd Street	I-5 to Canyon Road E
112th Street E	I-5 to Canyon Road E
152nd Street E	Spanaway Loop Road to Canyon Road E
176th Street E	Spanaway Loop Road to Canyon Road E
224th Street E	SR 7 to Canyon Road E
SR 7	S 38th Street to 224th Street E
Canyon Road	176th Street E to 104th Street E
Lacey	
Martin Way E	College Street SE to I-5
Pacific Avenue SE	College Street SE to SR 510
Marvin Road NE	41st Avenue NE to Mullen Road SE
Mullen Road SE	College Street SE to SR 510

ROADWAY NAME	APPROXIMATE EXTENTS
DuPont	
Center Drive	I-5 to Steilacoom-DuPont Road
Steilacoom-DuPont Road	I-5 to Union Ave
North Gate Road SW	Steilacoom-DuPont Road to Gravelly Lake Drive SW
Spanaway	
SR 7	SR 507 to S 38th Street
176th Street E	Spanaway Loop Road S to Canyon Road E
Spanaway Loop Road S	SR 704 to S Hosmer Street
Perimeter Road	Spanaway Loop Road S to 15th Street SW
112th Street S	I-5 to Canyon Road E
152nd Street E	Spanaway Loop Road S to Canyon Road E
Fredrickson	
160th Street E	152nd Street E to Canyon Road E
224th Street E	SR 7 to SR 161
Yelm and Roy	
SR 507	224th Street E to SR 702
SR 510	Mullen Road SE to SR 507
Yelm Highway SE	Cleveland Avenue SE to SR 510

Transit Service and Facilities

This section provides an overview of transit services and facilities available primarily in and around JBLM, including a description of park and ride facilities within the study area. There are three transit providers in the JBLM area, including Pierce Transit, Intercity Transit, and Sound Transit.

Pierce Transit

Pierce Transit is a public transit operator in Pierce County that connects JBLM with the main urbanized areas in Pierce County. There are five routes that provide access to JBLM facilities, with two of them providing direct service to the Base. The service areas, operating hours, and headways between bus arrivals are summarized in Table 5.

In addition to providing regular bus service, Pierce Transit runs on-demand service between McChord Base and the Lakewood Transit Center, called JBLM Connector. The service operates Monday through Friday from 7:00 a.m. to 9:30 a.m. and from 3:00 p.m. to 6:30 p.m. There are



Pierce Transit Bus

seven pick-up and drop-off locations for JBLM Connector, including the following stops:

- Lakewood Transit Center
- Lakewood Sounder Station
- Bridgeport Way & Pacific Highway SW
- Bridgeport Way & San Francisco Avenue SW
- Barnes Boulevard & D Street SW
- McChord Base Exchange
- Air Museum

JBLM Connector service is provided for the military personnel only and there is no fare for the service.

Table 5. Existing Pierce Transit Routes

ROUTES	AREA SERVED	APPROXIMATE OPERATING HOURS	WEEKDAY PM PEAK HEADWAYS (MIN)	AVERAGE WEEKDAY BOARDINGS (2018)	TOTAL 2018 BOARDINGS
1	University Place – Tacoma – Parkland - Spanaway	Weekdays: 4:05 am – 10:20 pm Saturday: 5:55 am – 10:30 pm Sunday: 6:25 am – 8:55 pm	15	5,290	1,655,699
3	Lakewood - Tacoma	Weekdays: 5:15 am – 9:15 pm Saturday: 6:15 am – 9:15 pm Sunday: 7:15 am – 10:15 pm	30	1,641	517,255
4	Lakewood – South Hill Mall	Weekdays: 5:45 am – 9:15 pm Saturday: 7:45 am – 8:45 pm Sunday: 8:15 am – 6:15 pm	30	1,335	400,402
206	Lakewood – Tillicum – Madigan Army Hospital Bldg	Weekdays: 5:45 am – 9:55 pm Saturday: 7:45 am – 8:45 pm Sunday: 8:00 am – 6:20 pm	30	950	288,819
214	Lakewood – JBLM North (VA Hospital) – Steilacoom (Pierce College)	Weekdays: 5:45 am – 9:45 pm Saturday: 8:45 am – 7:45 pm Sunday: 9:45 am – 5:45 pm	30	571	162,795

Source: Pierce Transit (December 2019)

InterCity Transit

InterCity Transit is a public transportation agency that provides service within Thurston County and connects to destinations outside the county. There are two routes that link Olympia and Tacoma with stops in the study area. There are no routes that serve JBLM directly, but these bus routes serve park and ride lots within the study area (i.e., the SR 512 park and ride lot). The service areas, operating hours, and headways between bus arrivals for InterCity Transit are summarized in Table 6.



Table 6. Existing InterCity Transit Routes

ROUTES	AREA SERVED	APPROXIMATE OPERATING HOURS	WEEKDAY PM PEAK HEADWAYS (MIN)	AVERAGE DAILY BOARDINGS ¹	ESTIMATED ANNUALIZED TOTAL BOARDINGS ²
612	Olympia – Lacey – Lakewood - SR 512 P&R - Tacoma	Weekdays: 5:50 am – 7:30 pm	20	761	193,967
620	Lakewood – SR 512 P&R - Tacoma	Weekends: 9:00 am – 7:00 pm	–	249	26,679

Source: InterCity Transit (December 2019)

1. Based on September 2019 – October 2019 InterCity Transit Data

2. Estimated annual boardings based on 362 days of service using daily average boardings from September – October. The September – October timeframe represents the highest season for InterCity Transit ridership.

Sound Transit

Sound Transit is a public transit agency that operates the following transit services: the Link Light Rail system, Sounder commuter rail, and the Sound Express bus system. Sounder commuter rail provides service between Seattle and the Lakewood Transit Station near the interchange of I-5 with Bridgeport Way. Service operates during traditional peak period commutes on weekdays with a majority of the trains running inbound to Seattle in the morning and outbound in the afternoon. There are eight trains running from Lakewood to Seattle between

4:30 a.m. and 10:16 a.m., and eight trains running from Seattle to Lakewood between 9:11 a.m. and 7:46 p.m. Sounder South Capacity Expansion was approved in 2016 which identifies additional stations to be added at Tillicum and DuPont by 2036.

Sound Transit Express provides a regional bus service in Seattle Metropolitan Area. There are three routes that connecting park and rides within the study area (SR 512 park and ride) and Seattle, Tacoma, and Puyallup. The service areas, operating hours, and headways between bus arrivals are summarized in Table 7.

Table 7. Existing Sound Transit Routes

ROUTES	AREA SERVED	APPROXIMATE OPERATING HOURS	WEEKDAY PM PEAK HEADWAYS (MIN)	AVERAGE WEEKDAY BOARDINGS (2018) ¹	TOTAL 2018 BOARDINGS ¹
580	Puyallup – SR 512 P&R - Lakewood	Weekdays Eastbound: 6:53 am, 7:23 am Weekdays Westbound: 3:17 pm, 3:57 pm, 4:37 pm	40	777	198,152
592	DuPont – SR 512 P&R - Seattle	Weekdays Northbound: 4:05 am – 7:50 am Weekdays Southbound: 2:28 pm – 6:22 pm	14,16,20	804	205,043
594	Lakewood - SR 512 P&R – Tacoma - Seattle	Weekdays Northbound: 8:30 am – 10:00 pm Weekdays Southbound: 5:30 am – 2:20 pm Weekends: 5:00 am – 10:00 pm	30	2,131	771,962

Source: Sound Transit (December 2019)

1. Based on 2020 Service Implementation Plan, Sound Transit, November 2019.



Go Transit Shuttle



JBLM Vanpool

Go Lewis-McChord

Go Lewis-McChord provides alternative transportation options to get around JBLM and the Puget Sound region. The following services are offered:

- **Go Transit** is a free shuttle service that connects various destinations on JBLM and links to destinations off the Base. The shuttle service runs every 20 minutes during duty hours between 7:00 am and 6:00 pm Monday through Friday and between 10:00 am and 6:00 pm on weekends with 40-minute headways. The service connects JBLM North, JBLM Main, Madigan and McChord Field on the Base, and serves the off-base DuPont Transit Center and the SR 512 park and ride lot.
- **Go Bike** is a bike-share program that provides short- and long-term bike and gear rentals to all Department of Defense employees and family members for free.
- **Go Rideshare** is a vanpool program for JBLM personnel as well as civilians.

Vanpools

JBLM continues to promote carpool and vanpool as an alternative to drive-alone commuting to the various worksites on the Base. A vanpool typically includes a group five to 15 people who commute together in a van provided by a transit agency. One person in the vanpool is the designated driver and is responsible for the vehicle. Vanpool service within the study area is available under contract with Pierce Transit and InterCity Transit. Table 8 summarizes vanpool ridership and identifies the number of vanpools currently serving the area.

All Department of Defense personnel are eligible for the “Mass Transportation Benefit Program” (MTBP) that subsidizes the use of transit (including carpool and vanpool) up to \$265 per month.

Table 8. Existing Number of Vanpools

TRANSIT AGENCY	NUMBER OF VANPOOLS	NUMBER OF PEOPLE PER VANPOOL
Pierce Transit	24	7
InterCity Transit	25	NA

Source: Pierce Transit and InterCity Transit (December 2019)

Park and Ride Lots

There are five primary park and ride lots within the study area. They include:

SR 512 Park and Ride

This lot is located one half block east of the intersection of South Tacoma Way and Pacific Highway South, adjoining I-5 at Exit 127 (SR 512). This park and ride lot is operated and maintained by Pierce Transit. And is served by Pierce Transit Routes 3 and 4; Sound Transit routes 574, 592, 594; and InterCity Transit routes 612 and 620. The lot has 493 stalls and is typically at or over capacity (utilization rate of approximately 95% in 2018).

Lakewood Sounder Station

This lot is located at the intersection of Pacific Highway South and 47th Avenue SW, approximately 0.4 miles north of the I-5/Bridgeport Way interchange (Exit 125) at the Lakewood Transit Station. This park and ride lot is operated and maintained by Sound Transit and provides 600 parking stalls,



SR 512 Park & Ride

Photo cred: Tacoma News Tribune

bicycle racks and lockers, shelters, and kiosk ticket machines. The station is served by regional and local bus routes and the Sounder Lakewood to Seattle commuter rail line. Specifically, the park and ride lot is served by Sound Transit routes 580, 592 and 594; and InterCity Transit routes 612 and 620 and has a utilization rate of approximately 89 percent .

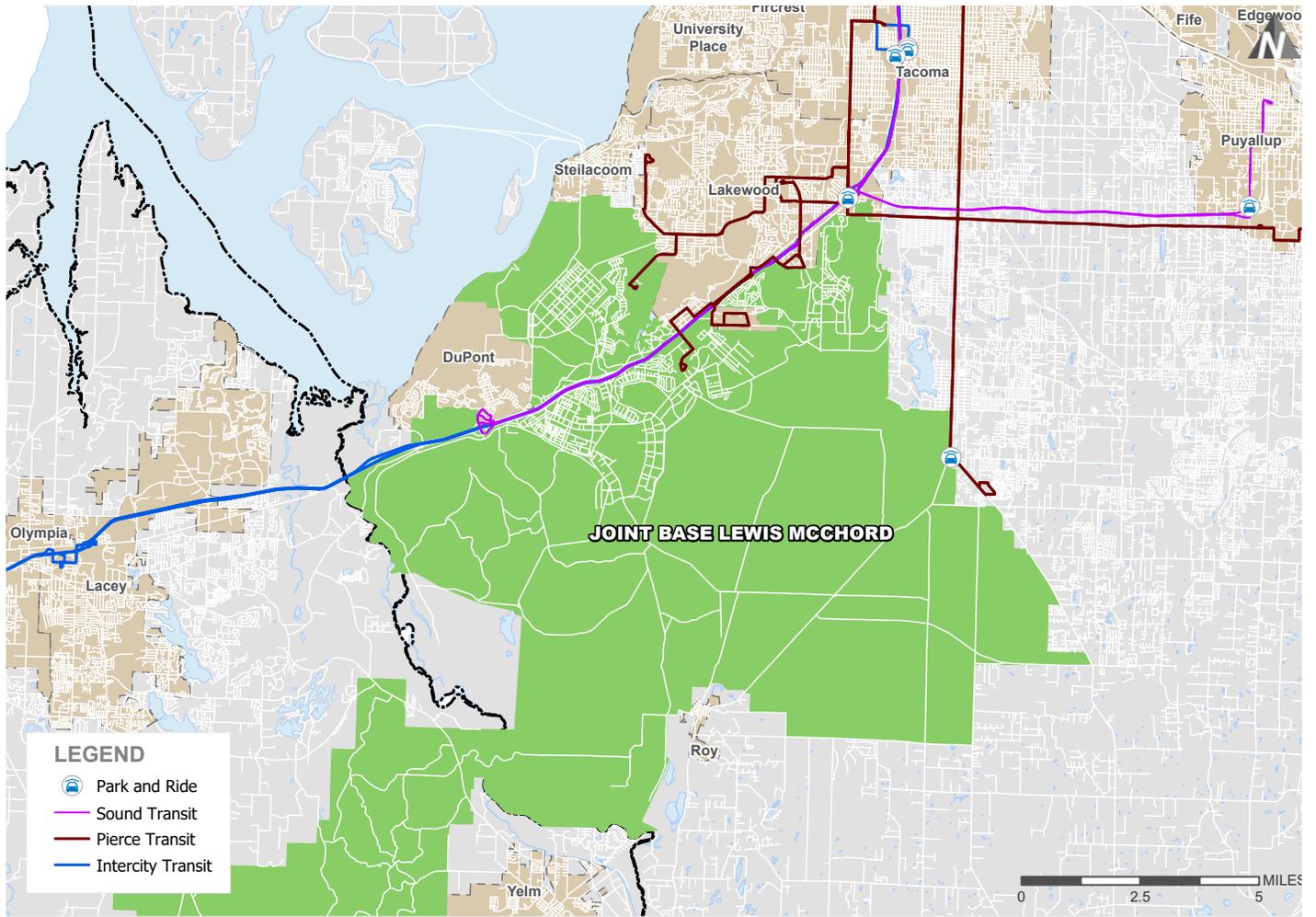
Table 9. Park and Ride Inventory

PARK AND RIDE FACILITY	CITY	LOCATION	TRANSIT AGENCY	APPROXIMATE NUMBER OF PARKING STALLS	AVERAGE DAILY UTILIZATION (2018)
SR 512	Lakewood	I-5 & SR 512	Pierce Transit	493	95%
Lakewood Sounder Station	Lakewood	Pacific Hwy & 47th Ave SW	Sound Transit	600	89%
DuPont	DuPont	Wilmington Dr & Palisade Blvd	Sound Transit	126	80%
Roy "Y"	Spanaway	SR 507 & Pacific Avenue S	Intercity Transit	100	26%
Martin Way	Lacey	I-5 & Martin Way	Intercity Transit	318	- ¹
Hawks Prairie	Lacey	Hogum Bay Road	Intercity Transit	347	- ¹

Sources: (1) InterCity (2) Pierce Transit

1. Information not available

Figure 3. Transit Facilities and Routes



DuPont Park and Ride

This lot is located at the intersection of Wilmington Drive and Palisade Boulevard in the City of DuPont. This park and ride lot is operated and maintained by Sound Transit, and has 126 parking spaces and bicycle lockers and racks. The park and ride lot is served by Sound Transit routes 592 and 594 and has a utilization rate is approximately 80%.

Roy “Y” Park and Ride

This lot is located at the intersection of SR 507 and Pacific Avenue S in Spanaway. It has 100 parking spaces and is served by Pierce Transit route 1. The lot has a utilization rate of approximately 26%.

Martin Way Park and Ride

This park and ride lot is located off I-5 at Martin Way has 318 parking spaces and it captures many travelers who are driving from Thurston County to Pierce and King Counties. The lot is served by Intercity Transit route 612.

Hawks Prairie Park and Ride

This lot is located at 2548 Hogum Bay Road NE in the City of Lacey. This facility has 332 parking spaces, 10 ADA parking spaces, and five electric vehicle charging stations.

Figure 3 is a map of the transit service and park and ride lots within the study area. A summary of the park and ride lot inventory data, including number of parking stalls and utilization is shown in Table 9.

Access Control Points

Multiple access control point (ACP) locations, also known as gates, are provided to access JBLM. The ACP locations are categorized into three areas: Lewis Main, Lewis North, and McCord Field. There are 9 total ACP locations that provide direct access from the I-5 corridor, as listed below:

Lewis Main

- Center Line Gate (Exit 116/118)
- DuPont Gate (Exit 119)
- Liberty Gate (Exit 120)
- Madigan Gate (Exit 122)
- Logistic Center Gate (Exit 123)

Lewis North

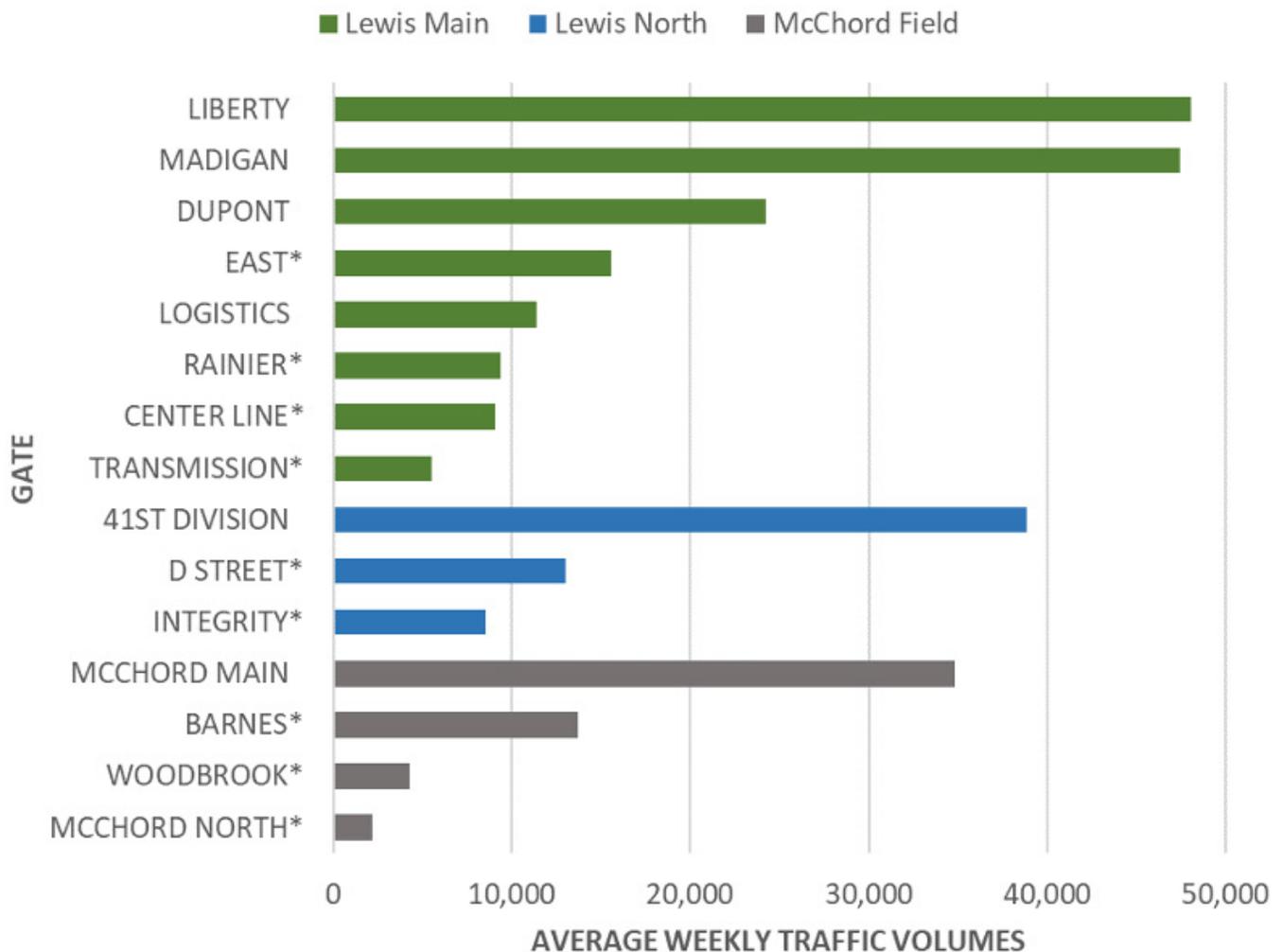
- 41st Street Gate (Exit 120)
- Integrity Gate (Exit 119)

McCord Field

- Woodbrook Gate (Exit 124)
- McCord Main Gate (Exit 125)

The estimated average weekly traffic volume at each gate is shown on Figure 4 based on volume data provided by JBLM between October 2019 and December 2019. Gates are color-coded based on the area served within JBLM. A map of the access control points (ACPs) is presented on Figure 5.

Figure 4. Average Weekly Gate Volumes (October 2019 – December 2019)



* Volume estimated with 2017 gate counts (2015 for Rainier Gate).

Figure 5. 5-Mile Buffer Around Access Control Points

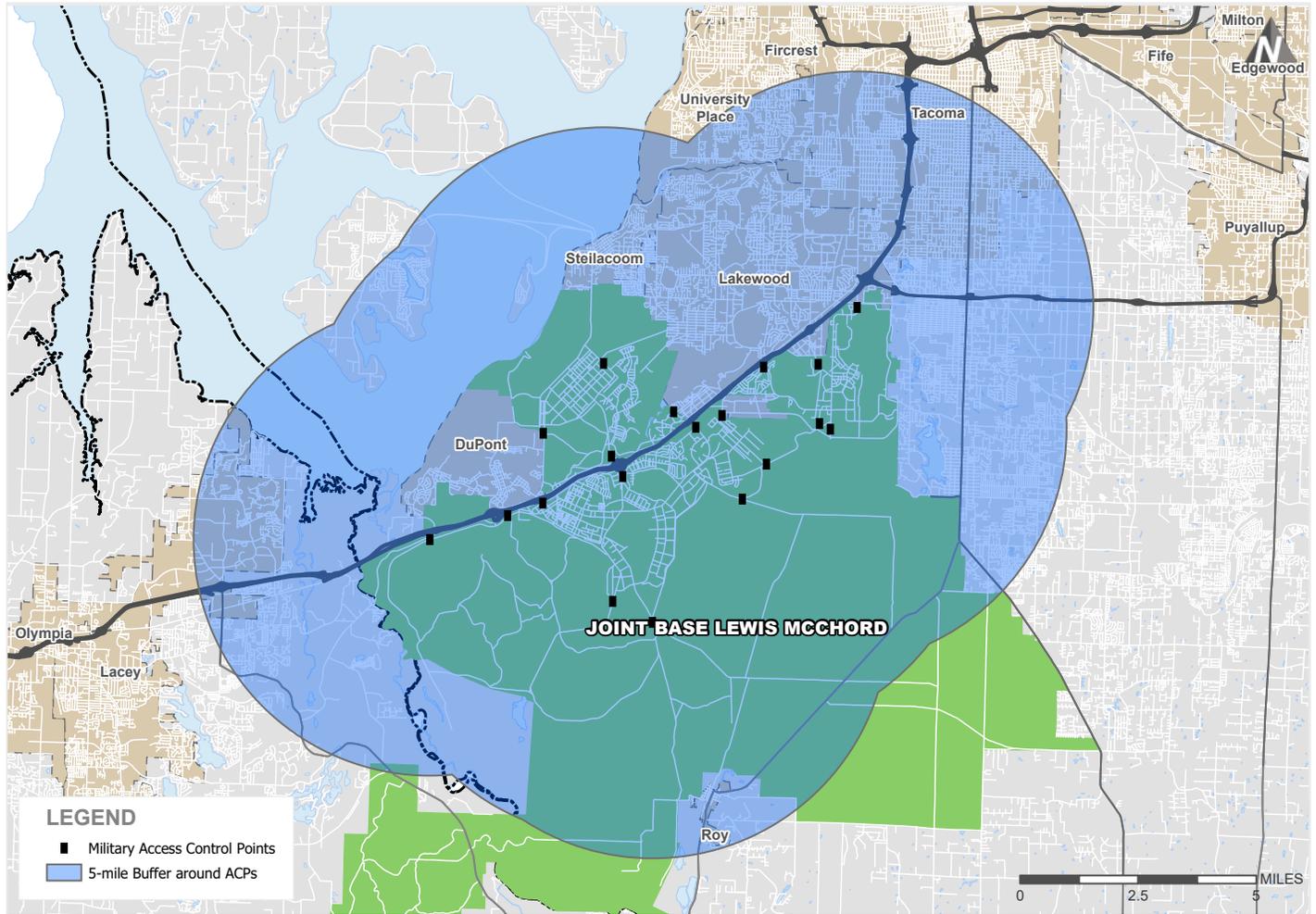


Figure 4 shows that the top 5 most utilized ACP locations are all located along the I-5 corridor and can be accessed directly via I-5 interchanges. In fact, those ACPs with direct access from I-5 as listed above are utilized by the majority (approximately 80 percent) of JBLM traffic. Approximately 44,000 weekly vehicle trips, or 15 percent, use gates located on the southeast side of the base, and approximately 13,000 weekly vehicle trips, or 5 percent, access Lewis North using the D Street gate. Note that the McChord North gate carries the least amount of traffic as this gate opens irregularly and does not follow a specific schedule. It should also be noted that as of Spring 2020, the D Street gate has been closed due to the COVID-19 pandemic. Traffic that previously accessed Lewis North via the D Street gate is expected to shift to the Integrity Gate located 2 miles to the southwest.

As shown on Figure 5, the five-mile radius around all the existing JBLM ACPs captures Nisqually Tribal Lands, DuPont, Steilacoom, Lakewood, South Tacoma, Parkland, Spanaway, Roy, and parts of Lacey.

Travel Patterns

It is important to understand the travel distribution patterns of military personnel who access JBLM when estimating the impact of JBLM-related traffic on the transportation infrastructure within the study area. This study uses several data sources to provide input and guidance in understanding these travel patterns including the 2018 JBLM-Camp Murray Region Survey and StreetLight data.

The South Sound Military and Communities Partnership (SSMCP) conducted a survey to

gather the information about military personnel, including a question about home location. The survey was conducted in Spring/Summer of 2018 and included 2,482 responses through an on-line survey platform, Survey Monkey. The sample of respondents included DOD civilians, active duty service members, and military retirees. The survey indicated that approximately 86 percent of respondents live off the base, with the highest concentration of military personnel living south of JBLM in the Lacey/Olympia area (22 percent), DuPont/Lakewood/Steilacoom area (16 percent), Parkland/Puyallup area (14 percent), Tacoma area (9 percent), and Yelm/Roy area (7 percent).

It is important to note that the civilian and retired military personnel included in the survey do not commute regularly to JBLM area and most likely do not have travel impact on the study area during peak travel periods. Hence, an additional data resource from StreetLight was used to understand peak period travel patterns to and from JBLM. StreetLight is a transportation analytics platform

that uses navigation-GPS and Location-Based Services data and covers about 23 percent of the adult population in the US and Canada. Specifically, trip Origin and Destination-related data was obtained, reviewed and used to augment our understanding of travel patterns to and from JBLM study area. The analysis shows the following travel patterns which are also illustrated in Figure 6.

- 20 percent of JBLM commuters travel to the Lacey and Olympia region
- 17 percent travel to Frederickson
- 16 percent travel to the Lakewood and Steilacoom area
- 15 percent travel to Tacoma and north
- 12 percent travel to south of Nisqually and JBLM
- 9 percent travel to DuPont
- 5 percent travel east of JBLM (Spanaway)

Figure 6. Travel Patterns to and from JBLM



Key Bottlenecks and Travel Times

Weekday PM peak hour congestion hot spots and bottlenecks were reviewed using data from Google Maps. Table 10 summarizes the approximate commute times between JBLM and surrounding areas. PM peak hour commute times range from 12 to 50 minutes.

Table 10. Weekday PM Peak Hour (5:00 pm) Commute Times to JBLM

ROUTE	DISTANCE IN MILES	TRAVEL TIME IN MINUTES
JBLM - Lakewood	8	14-28
JBLM - DuPont	6	12-20
JBLM - Lacey	16	22-40
JBLM - Yelm	14	30-50
JBLM - Parkland	10	16-30
JBLM - Tacoma	16	20-35

Source: Google Maps (January 2020)

Typical areas with high PM peak hour congestion in Pierce County are shown in Figure 7 and include such major corridors as I-5, SR 512, SR 7, and Steilacoom-Dupont Road.

Table 11. Document Inventory

DOCUMENT	JURISDICTION
City of Dupont Six-Year Transportation Improvement Program	DuPont
Pierce County 2019-2024 Transportation Improvement Program	Pierce County
City of Lacey 2019 Capital Facilities Transportation Plan	Lacey
City of Lakewood FEMA Flood Study 2019	Lakewood
City of Lakewood Six-Year Transportation Program 2020-2025	Lakewood
TRPC Regional Transportation Plan 2016	Thurston Regional Planning Council
Draft 2020 TRPC Regional Transportation Plan	Thurston Regional Planning Council
JBLM Master Plan	JBLM
Parkland-Spanaway-Midland Transportation Project Priorities	Parkland
Pierce Transit Development Plan 2019-2024	Pierce Transit
PSRC Regional Transportation Plan 2018	Puget Sound Regional Council
PSRC Regional Transportation Plan 2019	Puget Sound Regional Council
City of Roy Transportation Improvement Plan 2019-2024	City of Roy
Steilacoom Transportation Improvement Plan 2019-2024	Steilacoom
Thurston County 2020-2025 Transportation Improvement Plan	Thurston County
Thurston County Regional Transportation Plan 2040	Thurston County
WSDOT I-5 Tumwater to Mounts Road Study	WSDOT

Source: Transpo Group, 2020

Typical slowdown areas in Thurston County are shown on Figure 8 and include I-5, SR 510 in Lacey, Martin Way E between Marvin Road SE and the I-5 interchange, College Street SE, Old Pacific Highway at SR 510, Steilacoom-Dupont Road, and Center Drive.

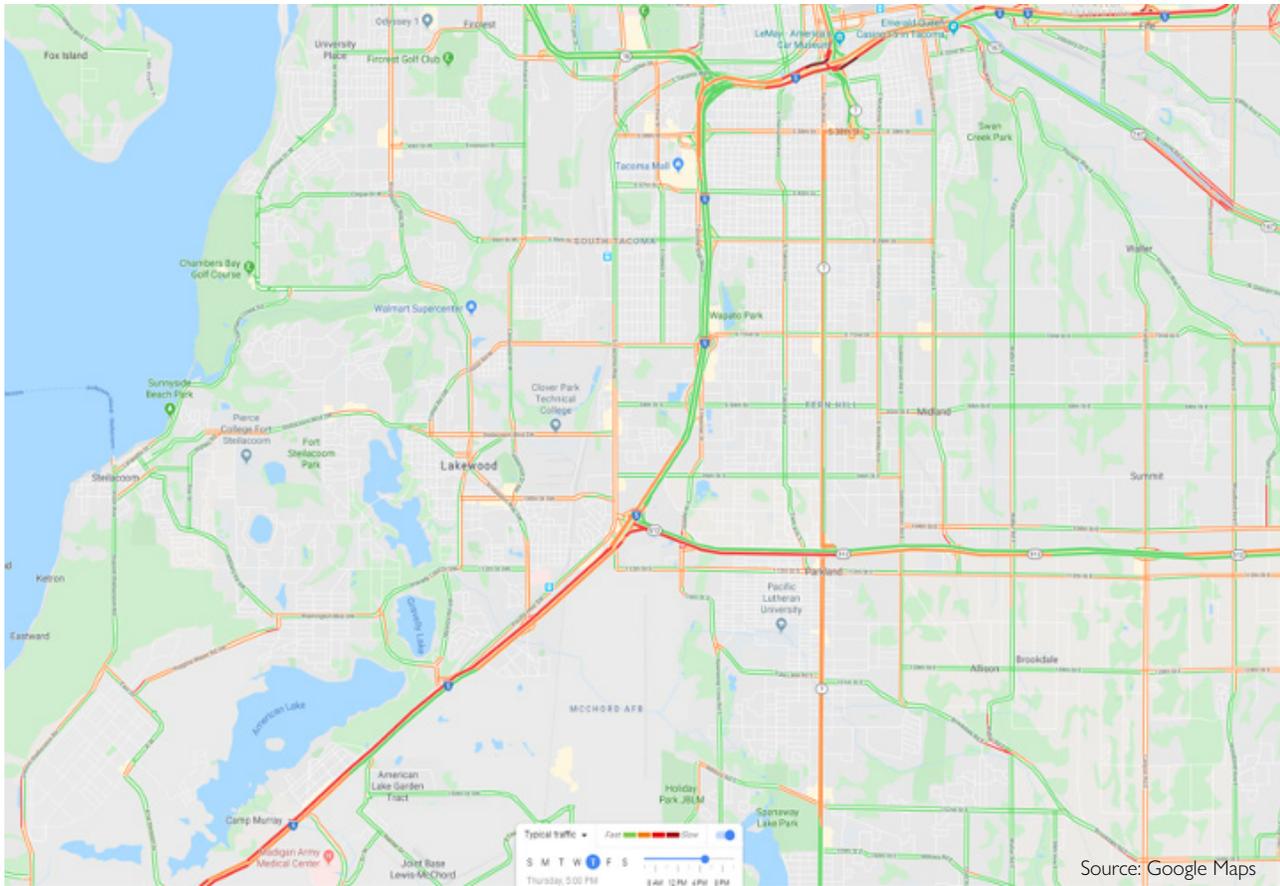
PLANNED PROJECTS AND PROGRAMS

An inventory of documents reviewed for the project identification process are summarized in Table 11. A detailed list of all identified projects is included in Appendix C.



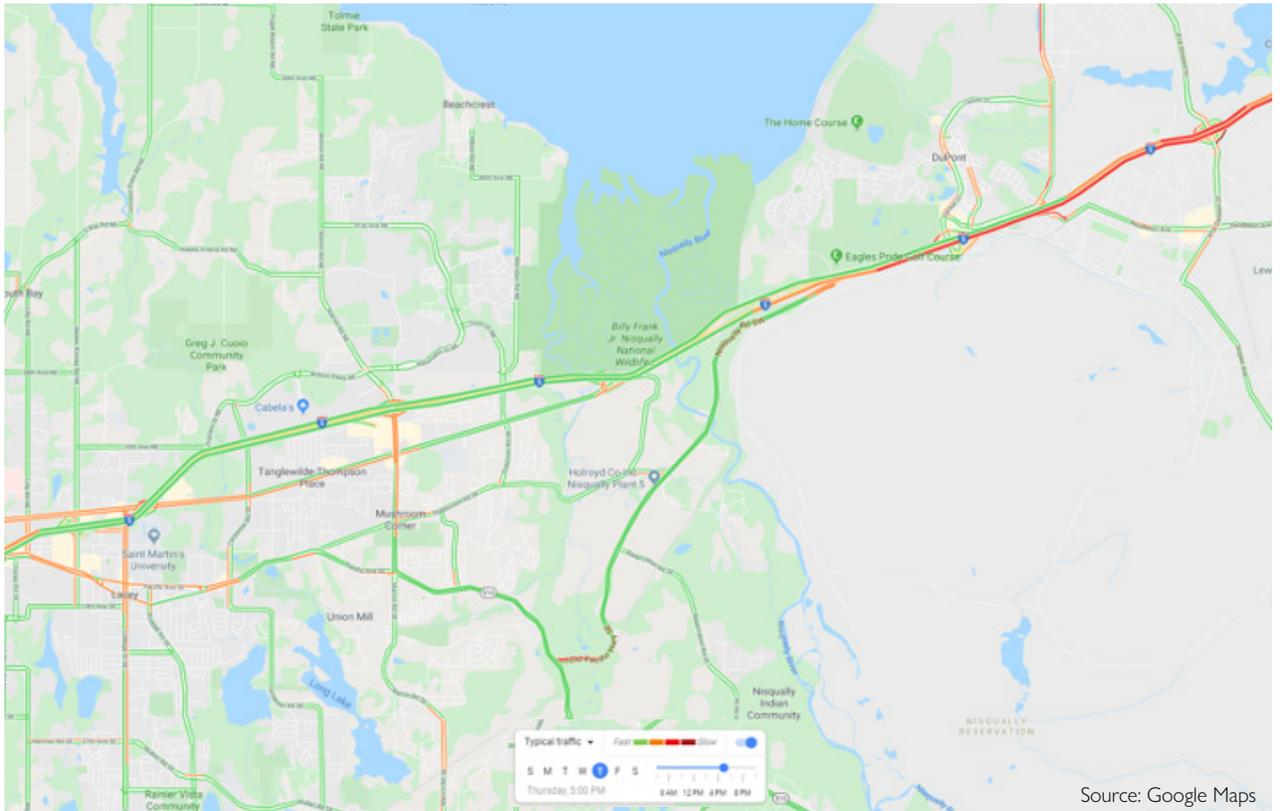
Based on the review of the planning documents, a project list was compiled of 151 possible projects in the area that could benefit access to/from JBLM. The types of projects identified from the documents included Capital Infrastructure Projects, Public Transportation Projects, Transportation Studies, and Travel Demand Management Strategies. The list of projects was used as a starting point to determine which projects would best address the needs of the JBLM workforce.

Figure 7. Typical Pierce County Weekday PM Peak Hour Traffic Congestion



Source: Google Maps

Figure 8. Typical Thurston County Weekday PM Peak Hour Traffic Congestion



Source: Google Maps

CHAPTER THREE TRANSPORTATION NEEDS



BUILDING ON the information presented and discussed in Chapters 1 and 2, this chapter describes the transportation system context for identifying, screening and prioritizing improvements to JBLM access. As noted in Chapter 1, the primary goal of this study is to improve access and mobility for JBLM employees and visitors in support of the mission critical activities of the Base. Equally important is the goal of enhancing mobility for the surrounding communities which are impacted by Base-oriented traffic. Accomplishing these objectives requires a solid understanding of existing and potential future transportation system needs.

Included in this chapter is a discussion of population growth projections for JBLM, Washington State and surrounding communities, as well as a synopsis of key traffic congestion problems along the major corridors approaching the Base. The information presented in this chapter was used to identify and help prioritize transportation corridors that currently limit JBLM access and/or which offer opportunities for improved access through the evaluation and screening of mobility improvements which is further discussed in Chapter 4.

POPULATION GROWTH PROJECTIONS

The south Puget Sound area has experienced rapid population growth over the past 20 years and is expected to continue to grow into the foreseeable future. Table 12 presents population statistics for Washington State, Pierce and Thurston Counties, and various cities in the vicinity of JBLM for 2000 and 2020 (estimated by WA Office of Financial Management).

Table 12. Document Inventory

	2000 POPULATION ¹	2020 POPULATION ³	% CHANGE
JBLM	19,0891	23,700 ²	24.2%
Washington State	5,894,121	7,656,200	29.9%
Pierce County	704,820	900,700	27.8%
DuPont	2,452	9,525	288.5%
Lakewood	58,211	60,030	3.1%
Roy	260	820	215.4%
Steilacoom	6,049	6,505	7.5%
Tacoma	193,556	213,300	10.2%
Thurston County	207,355	291,000	40.3%
Lacey	31,226	52,910	69.4%
Olympia	42,514	54,150	27.4%
Tumwater	12,698	24,600	93.7%
Yelm	3,289	9,400	185.8%
Study Communities	350,255	431,240	23.1%

1. U.S. Census Bureau

2. Source: JBLM. 2015 on-base population

3. Source: Washington State Office of Financial Management, April 1, 2020

Much of the population growth in the study area over the past 20 years has been clustered around the I-5 corridor including an estimated 24 percent growth in population on JBLM, nearly a tripling of growth in DuPont and almost 70 percent growth in Lacey. Both of these two communities serve JBLM employees and dependents and illustrate the underlying roots of growing traffic congestion in the I-5 corridor and along local roads which access the west side of JBLM. Further understanding of the effect of JBLM employment on areawide travel patterns is indicated through a review of zip code of residence data for employees as collected by JBLM. This data indicates that over 20,600 base employees live in Pierce County, and nearly 4,200 live in Thurston County. The characterization of travel patterns through the use of StreetLight data as presented in Chapter 2 further confirms the magnitude of traffic impacts and identifies the key locations that are affected by Base traffic.

Significant growth has also occurred along the east side of JBLM in the SR 507 corridor including nearly a tripling of population in Yelm and over a three times increase in Roy. Between 2000 and 2020 total population in study area communities grew by an average of over 23 percent (based on growth in the cities identified in Table 12).

The south Puget Sound region is expected to continue to grow, with more than an 18 percent population increase in Pierce and Thurston Counties between 2010 and 2040, as indicated in Table 13. The majority of the population within the study area is clustered around the I-5 corridor.

FUTURE TRAFFIC CONDITIONS

As illustrated in Figure 7 and Figure 8 in Chapter 2, existing study area congestion problems are largely concentrated on I-5, both in Pierce and Thurston Counties. I-5 provides the primary access to JBLM and the Washington State National Guard at Camp Murray, both of which are secure military bases. Eight highway interchanges provide access to the secure Access Control Points (gates) into and out of these bases.

In southern Pierce County, I-5 traffic has increased 16 percent between 2003 and 2017, to over 127,000 vehicles per day. Truck volumes during this same time increased 9 percent to over 14,400 trucks per day. Truck volumes on I-5 at the border between Pierce County and Thurston County are some of the highest in the state. The traffic increase in the study area has been influenced both by population and employment growth in the south Puget Sound region, and by increased economic activity at the state level, fostering a rapid rise in freight movement. Prior to initiating the I-5 JBLM Vicinity Congestion Relief Study (Congestion Relief Study), no through lanes had been added to I-5 in the study area since 1975. During that same time, the population in Pierce and Thurston Counties increased by more than 21 percent. As noted in Table 13, this trend is expected to continue in the future which will give rise to increasing levels of traffic congestion on the street and highway system in the vicinity of JBLM.

Table 13. Population Projections

	2010 POPULATION	2030 POPULATION	2040 POPULATION	PERCENT CHANGE 2020-2040
Washington State	6,724,540	7,551,759	7,920,676	11.8%
Pierce County	795,225	881,775	927,797	16.7%
Thurston County	252,264	292,608	312,061	23.7%

Source: Washington State Office of Financial Management, 2018



Traffic Forecasting

To assess the growing congestion problems on both I-5 and the arterial roads surrounding JBLM, the project area travel demand model developed for the WSDOT Congestion Relief Study was used to estimate 2040 PM peak hour volumes on study area roadways. This model was developed following the traditional four-step procedure including trip generation, trip distribution, mode choice and trip assignment. Model output included such information as traffic volumes and congested speed during peak periods. This information has been used to characterize the expected transportation challenges that affect Base access and to evaluate which potential improvements could have the greatest potential benefits for improved corridor mobility.

Congestion on State Routes and Local Arterials

Projected travel conditions for Interstate 5 indicate that congestion levels and travel times along the freeway will increase substantially with added delays at study area intersections where I-5 congestion is expected to spill back into the interchanges during peak periods.

Increased delays in entering or exiting I-5 would tend to push traffic demand growth onto the local roadway system. There are only a few local arterials in the study area, mostly located on the north side of JBLM, that either connect to an I-5 interchange, or run parallel to I-5 and can serve as an alternative route during periods of congestion. Based on the

forecast outputs from the model, existing bottlenecks along those corridors would be exacerbated due to the increase in traffic and delay from I-5 congestion.

In addition to expected future congestion along I-5 and the arterials that connect to or parallel the freeway, the SR 507 corridor on the south and east sides of JBLM is also expected to see substantive growth in volumes and congestion levels. Projected growth on the Base is expected to increasingly rely on segments of SR 507 in the vicinity of the City of Roy. In the southbound direction, SR 507 near Roy is anticipated to operate with stop-and-go conditions during the PM peak period due to both the increase in travel demand in the corridor and the limited intersection and roadway capacity that exists today. Congestion levels are expected to generally be high from the vicinity of Roy to Yelm south of the Nisqually River where more transportation options are available to disburse the projected traffic volumes.

Figure 9 illustrates the expected locations of traffic congestion during the 2040 PM peak hour in southern Pierce County, while Figure 10 shows 2040 PM peak hour congestion in northern Thurston County. The anticipated congestion shown in Figure 9 and Figure 10 is based on TRPC model outputs. As indicated in these figures, other locations where significant congestion is expected include: SR 510 between Yelm and I-5 at the Mounts Road interchange, SR 512 to the east of McChord Field, Steilacoom-DuPont Road to the west of I-5, Military Road and Perimeter Road to the east of McChord Field, and several other locations.

Figure 9. Typical Pierce County 2040 Weekday PM Peak Hour Traffic Congestion

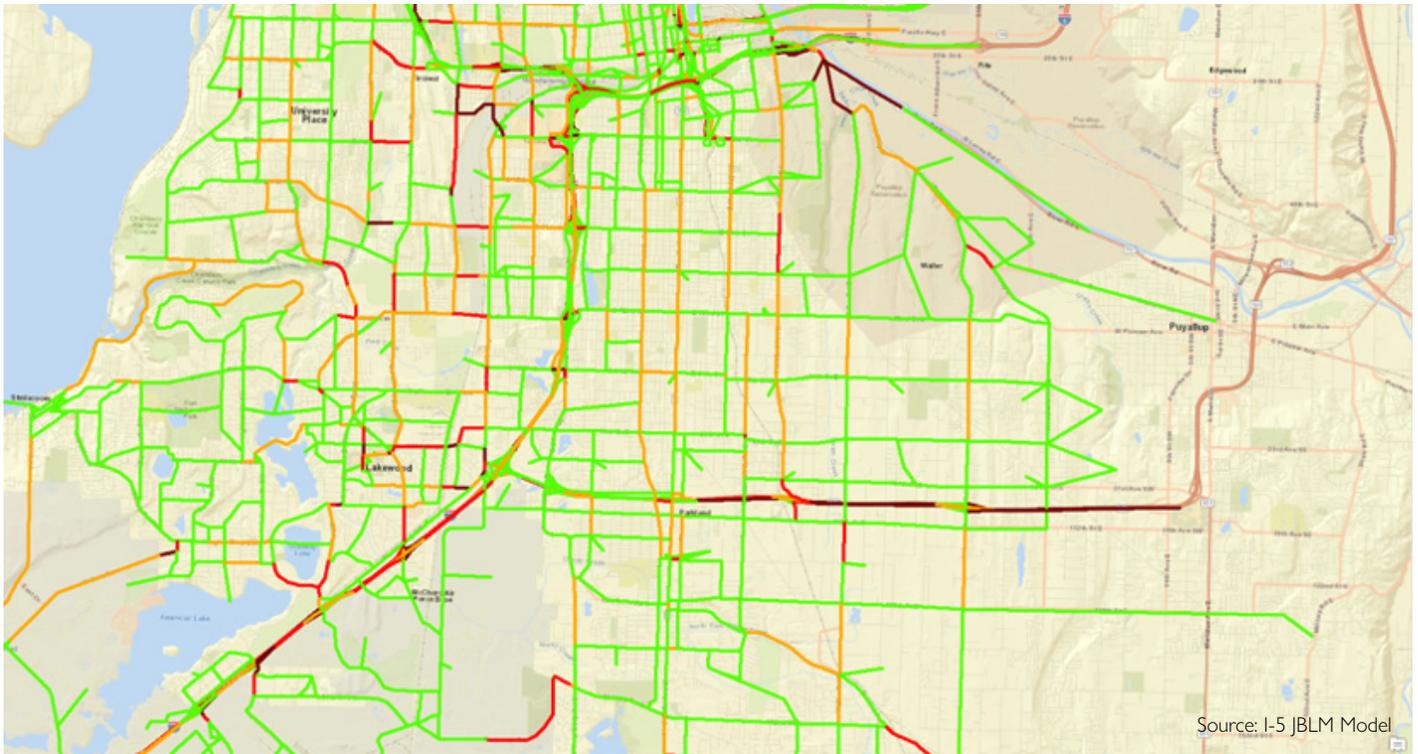
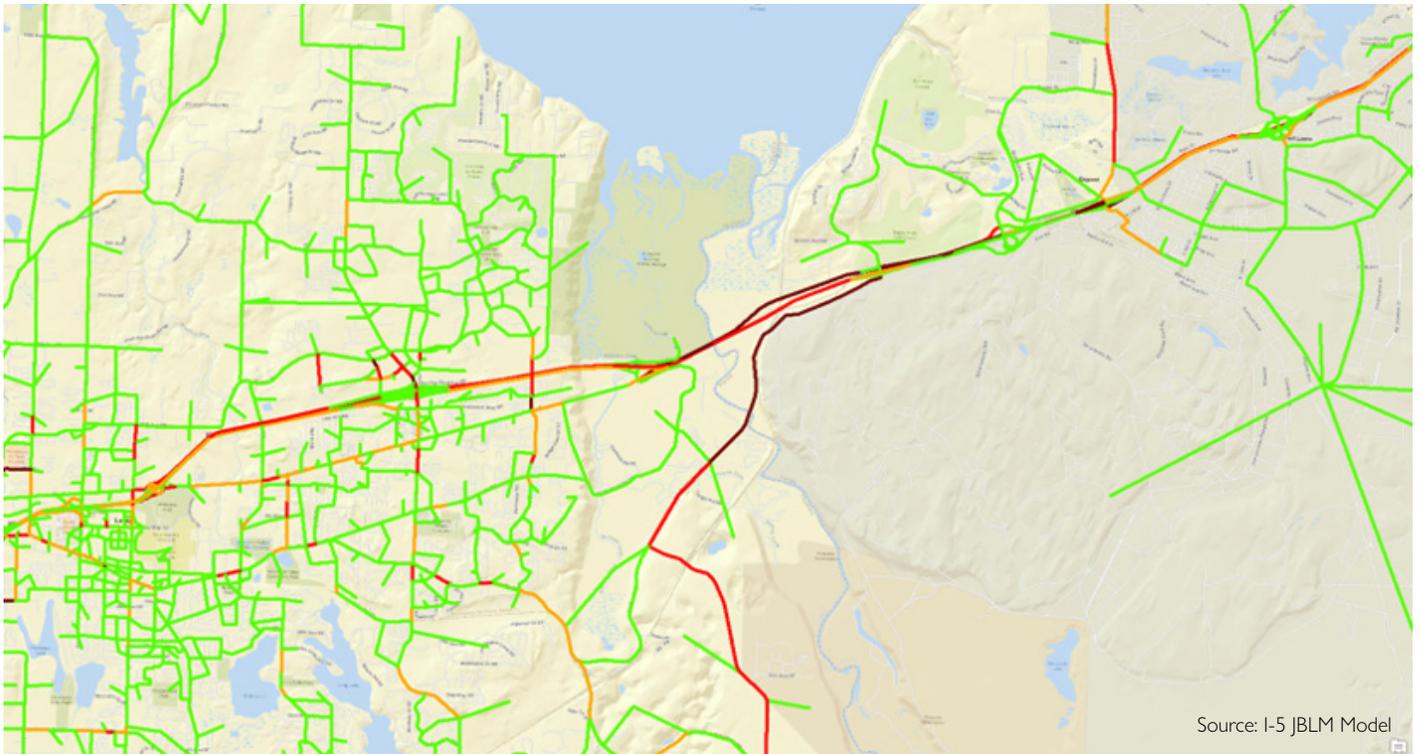


Figure 10. Typical Thurston County 2040 Weekday PM Peak Hour Traffic Congestion

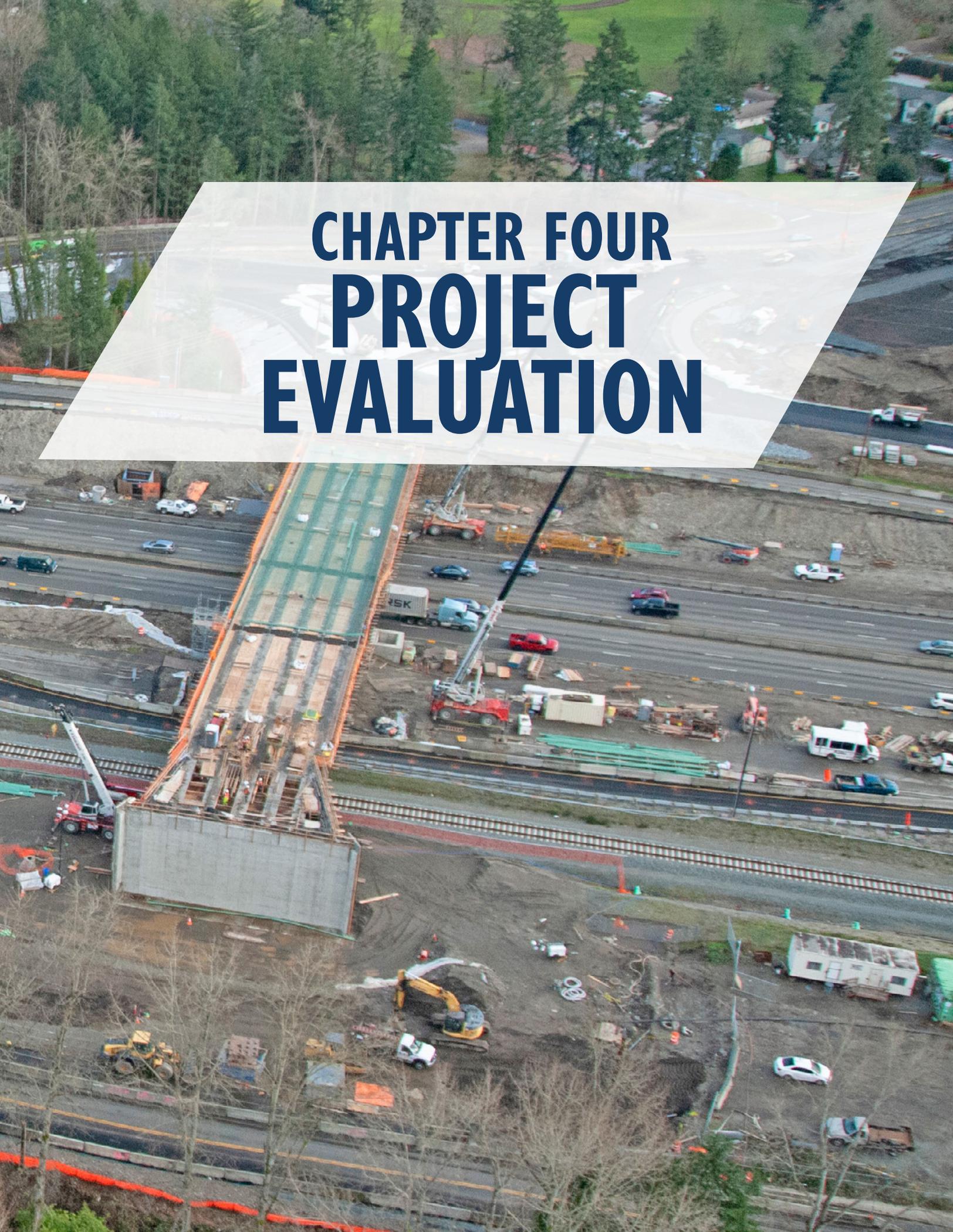


SUMMARY OF TRANSPORTATION NEEDS

Through the I-5 JBLM Congestion Relief Project, as well as state and local transportation plans and improvement programs, a clear need for transportation system improvements has been identified in the study area. The substantial improvements to the I-5 corridor that are currently underway will be of key importance in maintaining good long-term accessibility to and from JBLM. However, there is also a need to address growing traffic congestion on local arterial streets and non-freeway state highways all around the Base to ensure that travel needs for both the Base and local communities are adequately addressed. Chapter 4 documents the process of identifying and evaluating a range of arterial and non-freeway state highway improvements to address this need and leads to the development of a recommended course of action.



I-5 Congestion



CHAPTER FOUR PROJECT EVALUATION

A DETAILED

screening process was developed and utilized to identify a recommended set of projects to improve access to JBLM and maintain a safe and reliable transportation system both on- and off-JBLM.

This section summarizes how projects were identified and screened, and the evaluation criteria that were utilized to arrive at a set of recommended projects.

PROJECT SCREENING PROCESS

To identify and rank local, regional and state improvements that met the goals and objectives of the study, a multi-step project development and evaluation process was conducted as shown in Figure 11. Steps included in the process involved three increasing detailed levels of evaluation as follows:

- **Level 1** analysis included developing a list of 151 transportation improvement options that were subjected to an initial screening based on their responsiveness to two key criteria: were the projects already funded and did they serve the key corridors leading to/from JBLM, The initial project list was developed by relying largely on local, regional and state transportation plans and improvement programs that included a wide variety of projects in the vicinity of JBLM.
- **Level 2** screened projects that remained after the Level 1 screen to determine projects that would be most effective in meeting the overall purpose and goals of the study.
- **Level 3** involved an in-depth assessment of the projects that survived Level 2 screening to further narrow the project list to a prioritized series of recommended improvements that should be advocated for funding by SSMCP.

As shown in Figure 11, the screening process narrowed down the project list with each level of evaluation. At the start of the process, the project list consisted of 151 projects. After the Level One Screening process, the list narrowed to 56 projects to advance to Level Two. After the Level Two Screening process, the list narrowed to 20 projects that were further evaluated in Level Three Screening, prioritized, and included in the action plan.

Figure 11. Screening Process Overview

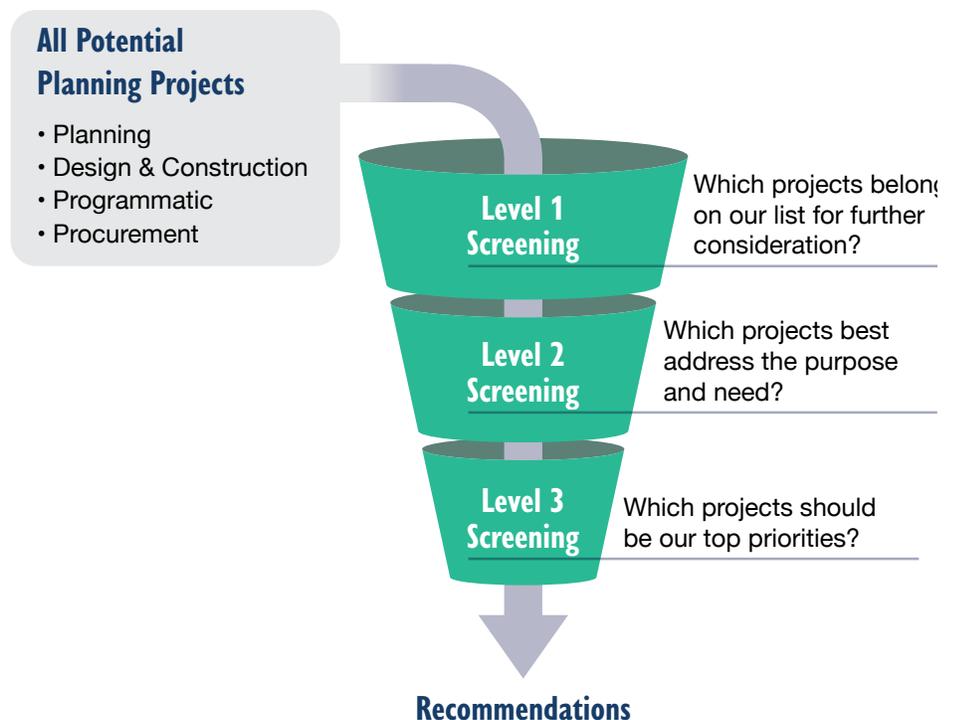
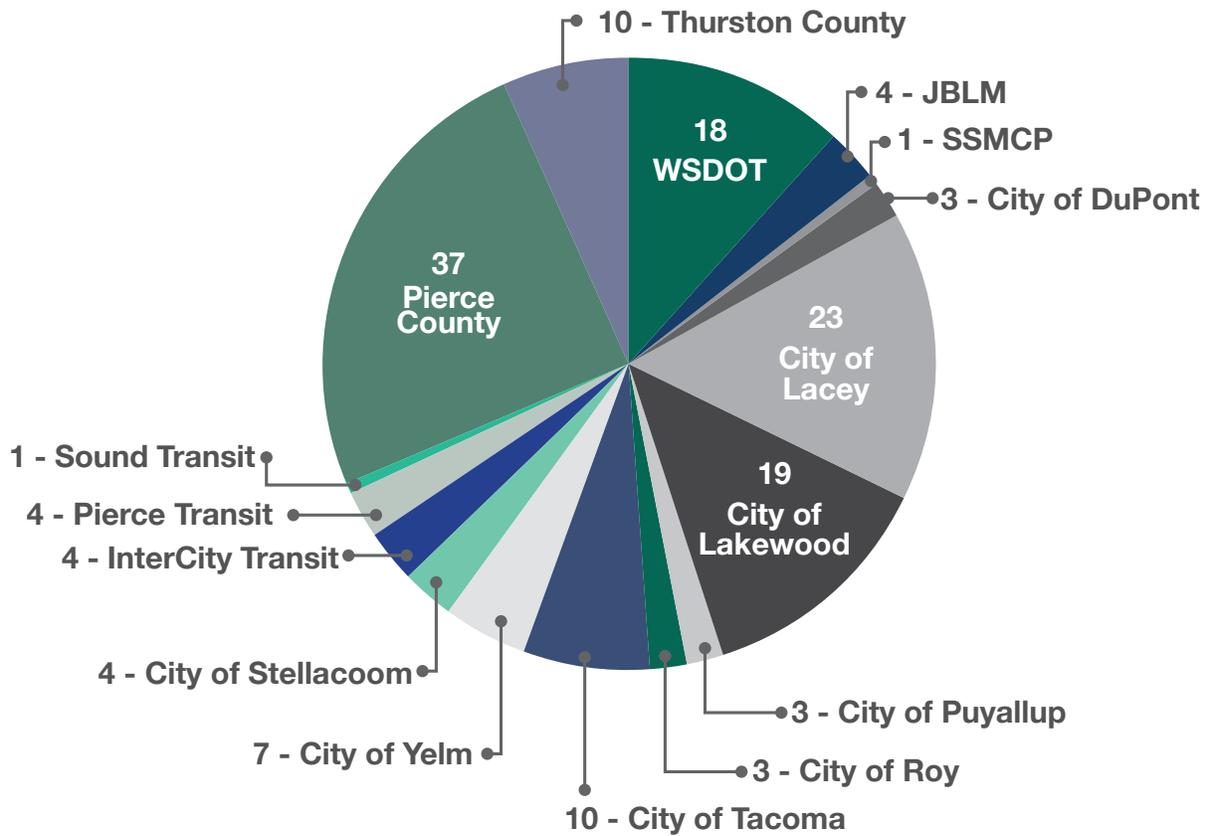


Figure 12. Projects Summarized by Agency



LEVEL ONE SCREENING

During the Level 1 screening process short- and long-term transportation plans and improvement programs of stakeholder agencies were reviewed, and a range of potential projects were identified along with key data related to project type, locations, funding, cost and estimated year of construction (where available). A total of 151 individual projects were identified which are summarized by agency in Figure 12. As shown in Figure 12, the agencies with the most projects identified include Pierce County, City of Lacey, City of Lakewood, and WSDOT.

 Appendix C provides the complete list of the 151 project options that entered the screening process.

Figure 13 summarizes projects by type. As shown in this figure the majority of projects are corridor and intersection projects, with corridor projects at 59 percent and intersection projects at 16 percent.

The Level 1 screening process is depicted in Figure 14. During Level 1 screening, an assessment of the initial 151 projects was conducted to identify whether the project was currently funded and/or whether it was located on or along a key corridor between JBLM and its surrounding communities. Out of the 151 projects identified, 21 currently funded projects were eliminated from further consideration and a further 74 projects were removed as they would not benefit a key corridor. Key study area corridors are identified in Figure 1. A total of 56 projects advanced to Level 2 screening. The process outlined in Figure 14 includes input from stakeholder agency comments.

Figure 13. Projects Summarized by Type

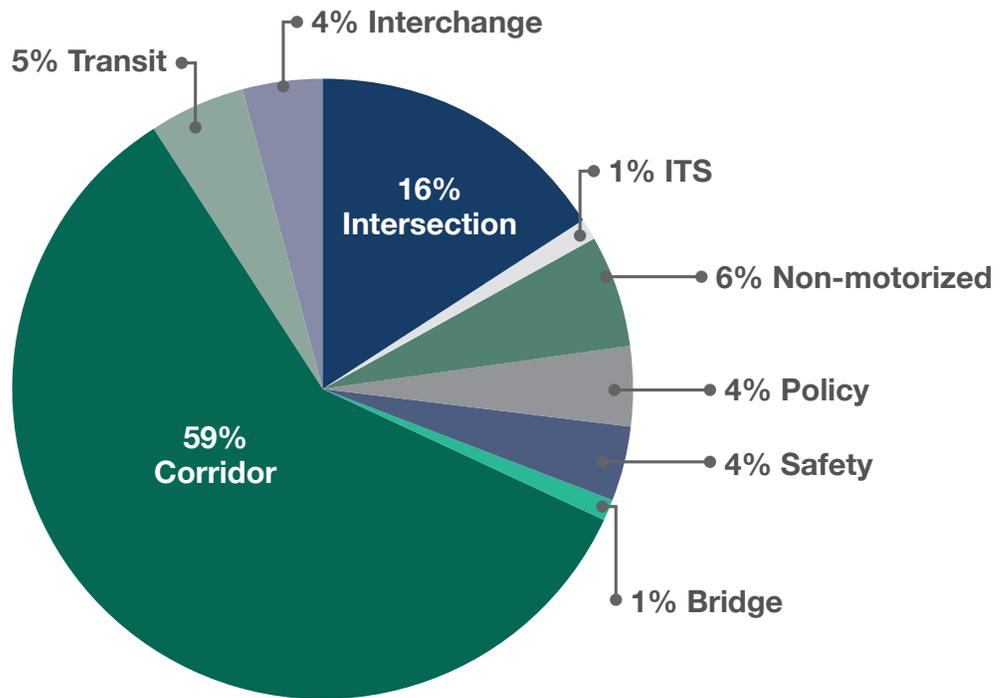
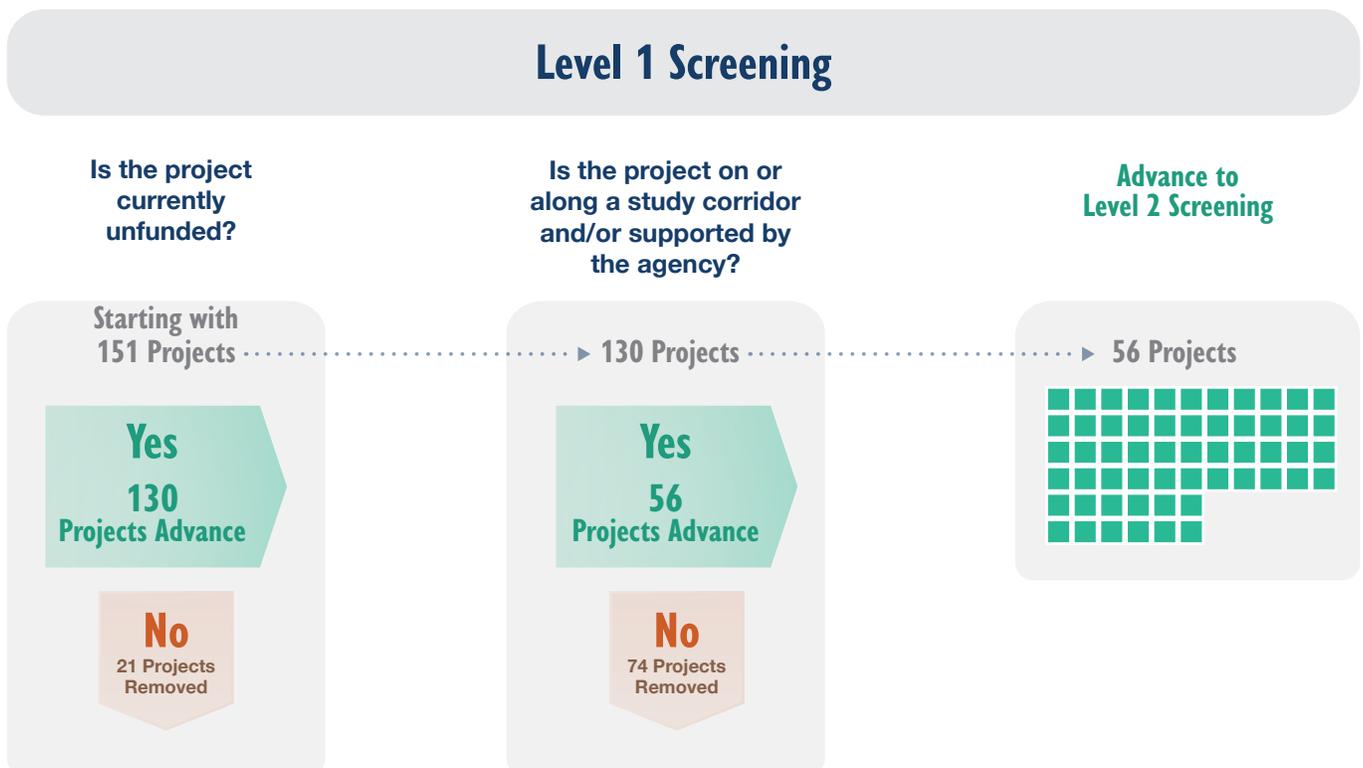


Figure 14. Level One Screening Process



LEVEL TWO SCREENING

Level 2 screening was based on criteria that attempted to address elements of the project purpose. Each of these criteria are summarized in Table 14 and are further defined in the paragraphs that follow.



**ENSURE
MOBILITY**



**PROVIDE
ALTERNATIVES**



**READY TO
IMPLEMENT**



**REGIONAL
SIGNIFICANCE**



**PROMOTE
RESILIENCY**

Table 14. Recommended Criteria for Transportation Project Evaluation and Prioritization

CRITERIA	EVALUATION
Ensure Mobility	Is project located on a congested corridor or corridor projected to have congestion in 2040?
	Does project construction improve efficiency/performance of existing system?
Provide Alternatives	Does project include bicycle/pedestrian facilities?
	Enhances transit service or access to transit
Promote Resiliency	Project readiness in terms of permitting/design status and/or availability of matching money
	Promotes partnerships
Regional Significance	Benefits multiple jurisdictions
	Percent of traffic accessing JBLM using Streetlight O-D data
Promote Resiliency	Facilitates emergency or mission critical access
	Environmental consequences

Source: Washington State Office of Financial Management, 2018

Discussion of Level 2 Evaluation Criteria



Ensure Mobility

1. Is the project located on an existing congested corridor or a corridor projected to have heavy congestion by 2040?

Existing - For existing conditions various levels of congestion were identified through the use of historical travel speed information available from Google Traffic. Data was presented for a location at or within the vicinity of each project which is measured as follows:

- **Intersections:** Included areas within 500 feet upstream and downstream of the intersection on each leg
- **Streets:** Included actual length of the project plus a 500-foot buffer on each end of the project

Existing operations was stratified based on four different speed categories as shown in Table 15.

Table 15. Mobility Scoring Criteria

EXISTING OPERATIONS	SCORE
Green (Fast), 85% to 100% of free flow speed	1
Orange (Moderate), 65% to 85% of free flow speed	3
Red (Slow), 45% to 65% of free flow speed	5
Dark Red (Stop-and-Go), 0% to 45% of free flow speed	7

Future 2040 - For 2040 conditions congestion was identified by travel speeds from the I-5/JBLM travel demand model for each intersection or roadway segment that included or bracketed an individual project as described above. As with existing conditions, congestion was defined as speeds within four categories and was scored in the same manner as presented in Table 15.

2. Would the project improve operations of the existing transportation system or would it involve substantive modifications to the existing system? A qualitative assessment was conducted in response to these two questions with results indicated as either Yes or No. Improvements were categorized as follows:

Existing System Yes – Transit, bicycle/pedestrian, ITS, signal enhancements, minor channelization (i.e., turn lanes), or replacement of existing facilities.

- **Substantive Modification Yes** – Construct new road or add a lane(s), major widening, new access
- A No response would not meet the definition for Yes as described above.

A Yes response to both questions was scored with 5 points, a Yes/No response was scored with 3 points, and a No/No was scored with 1 point.



Provide Transportation Alternatives

1. Does the proposed project include the addition of bicycle and/or pedestrian facilities?

Evaluation was based on a Yes/No response with 3 points for Yes and 1 point for No.

2. Is the project located on an existing transit route, does it provide additional transit service, and/or would it improve access to existing transit services?

Evaluation was based on a Yes/No response with 3 points for Yes and 1 point for No.



Pierce Transit Bus

Photo cred: Pierce Transit



Be Readily Implementable

1. Can project funding be obligated within five years?

This was determined by availability of local matching funds and permitting/design status as identified by sponsoring jurisdiction. Evaluation was based on a Yes/No response with 3 points for Yes and 1 point for No. Where information was not readily available from source documents, it was assumed that the project could not be obligated within five years.

2. Does the project provide an opportunity for multi-jurisdiction sponsorship?

Sponsorship may include participatory funding or simply a cooperative working relationship. Multi-jurisdictional projects were given higher priority. Evaluation categories included: High (involving more than 2 jurisdictions); Medium (involving 2 jurisdictions); and Low (involving just a single jurisdiction). As shown in Table 16, evaluation categories included High, Medium and Low with scoring that reflected these ratings.

Table 16. Mobility Scoring Criteria

JURISDICTIONS INVOLVED	SCORE
High (2 or more jurisdictions)	3
Medium (2 jurisdictions)	2
Low (1 jurisdiction)	1



Provide Regionally-Significant Benefits

1. Does the project provide positive benefits to more than one jurisdiction?

Evaluation categories were based on the percent of average weekday daily trips through the project area which started or ended in another jurisdiction. The information was based on Streetlight Origin-Destination (O-D) data obtained for the project. Scoring criteria is summarized in Table 17.

Table 17. Scoring Based on Positive Benefit to More than One Jurisdiction

PERCENT OF AVERAGE WEEKDAY DAILY TRIPS THROUGH PROJECT AREA WHICH START OR END IN ANOTHER JURISDICTION	SCORE
High (More than 30%)	3
Medium (Between 10% and 30%)	2
Low (Less than 10%)	1

2. What percentage of the average weekday daily traffic using the project is traveling to/from JBLM?

The criterion also evaluated the percentage of average weekday daily traffic volumes at the project location that were heading to or coming from JBLM. Analysis was based on Streetlight O-D data. Scoring was based on a tiered approach, depending on the percentage calculated in with Streetlight Data. The scoring criteria is summarized in Table 18.

Table 18. Scoring Based on Percentage of Daily Traffic to and from JBLM

DAILY TRAFFIC TO/FROM JBLM	SCORE
Less than 1%	0
1% to 5%	1
5% to 10%	2
Greater than 10%	3



Promote Resiliency

1. *Would the project provide improved access and traffic circulation for emergency or mission critical activities on JBLM?*

Improved access included provision of enhanced or redundant routing to serve one or more of the following locations: the Emergency Operations Center at Camp Murray (statewide significance), Madigan Hospital or McChord Air Traffic Control Center? Evaluation was based on review of potential vehicle routes to/from these locations in relation to project location(s). Evaluation was scored using a Yes/No response with 3 points for Yes and 1 point for No.

2. *Would the project promote the most efficient use of natural resources and would have the lowest impact on the surrounding environment as measured in two ways?*

Length of the project – this factor considered the actual project length in feet for roadway segments and assumed 250-foot impact area for each leg of an intersection. Distance was categorized and scored as shown in Table 19.

Table 19. Scoring Based on Length of Project

PROJECT IMPACT AREA	SCORE
Potential Slight Impact (0 to 1,000 feet)	7
Potential Low Impact (>1,000 feet to 5,000 feet)	5
Potential Moderate Impact (>5,000 feet to 10,000 feet)	3
Potential High Impact (>10,000 feet)	1

Type of project – this factor categorized projects by an assumed degree of potential impact associated with each project type. The various project types identified were intended to represent a surrogate for project footprint which helps to define the magnitude of a potential environmental impact. Project types were grouped and scored as shown in Table 20.

Table 20. Scoring Based on Project Type

PROJECT IMPACT	SCORE
Potential Slight Impact (Signal, intersection, or roundabout, bicycle/pedestrian improvements, safety project, transit)	5
Potential Moderate Impact (Widening, reconstruction, trails, or high capacity transit)	3
Potential High Impact (Added lanes, new road, replacement bridge, park-and-ride lots, interchange modifications)	1
Impact Cannot be Determined (typically planning studies)	0

The scores for the two resiliency criteria were averaged to obtain a final environmental score. These final scores were categorized as shown in Table 21.

Table 21. Average Score for Resiliency Criteria

PROJECT IMPACT	SCORE
Slight Impact	3 or more
Moderate Impact	2 to < 3
High Impact	1 to <2
Cannot be Determined	Less than 1

Level 2 Scoring and Weighting of Results

The second part of Level 2 screening analysis involved weighting the results from the screening process described above. Before this weighting was applied all policy or planning studies included on the project list were pulled onto a separate list and automatically advanced to Level 3 screening. The remaining projects for which weighting options were explored were all capital improvements.

Weighting the results of the initial Level 2 screening allowed for emphasis on specific criteria deemed to be more important than other criteria in identifying a recommended list of projects. Four weighting alternatives were developed and used to assess the scoring results for each project. These options are illustrated in Figure 15 and vary from equal weighting for all criteria to weighting that emphasized specific criteria such as mobility and/or regional significance.

Review of the total scores for each project using the four weighting options showed that there was a consistent set of projects that ranked within the top 20 scores. Thirteen of these projects ranked among the top 20 projects regardless of the weighting option applied. Two more projects ranked in the list of top 20 projects 75 percent of the time (or for three of the of the four criteria), seven projects ranked on this list 50

percent of the time (for two of the four criteria), and four projects ranked 25 percent of the time (for one of the four criteria). The value of this comparison among weighting alternatives was to identify an optimal break point or cut-off that determines which of the capital improvement projects should be carried forward into Level 3 screening. While interesting, the actual scores for each project resulting from the Level 2 screening process are not the major focus of this screening process. Rather, the most important take-away is how the projects score in comparison with each other.

Level 2 Evaluation Results

In summary, the Level 2 screening process focused on identifying projects that best met the purpose and need of the overall study using such criteria as mobility, multimodal enhancements, readiness for implementation, regional significance, and transportation system resiliency. The outcome of Level 2 screening was a shortlist of twenty projects – seventeen that included capital improvements and three studies that were carried forward into Level 3 screening which is described in the following section. A summary of Level 2 screening results is illustrated in Figure 16.

The locations of the seventeen capital projects are presented in Figure 17.

Figure 15. Level Two Options for Weighting the Scoring of Potential Improvements

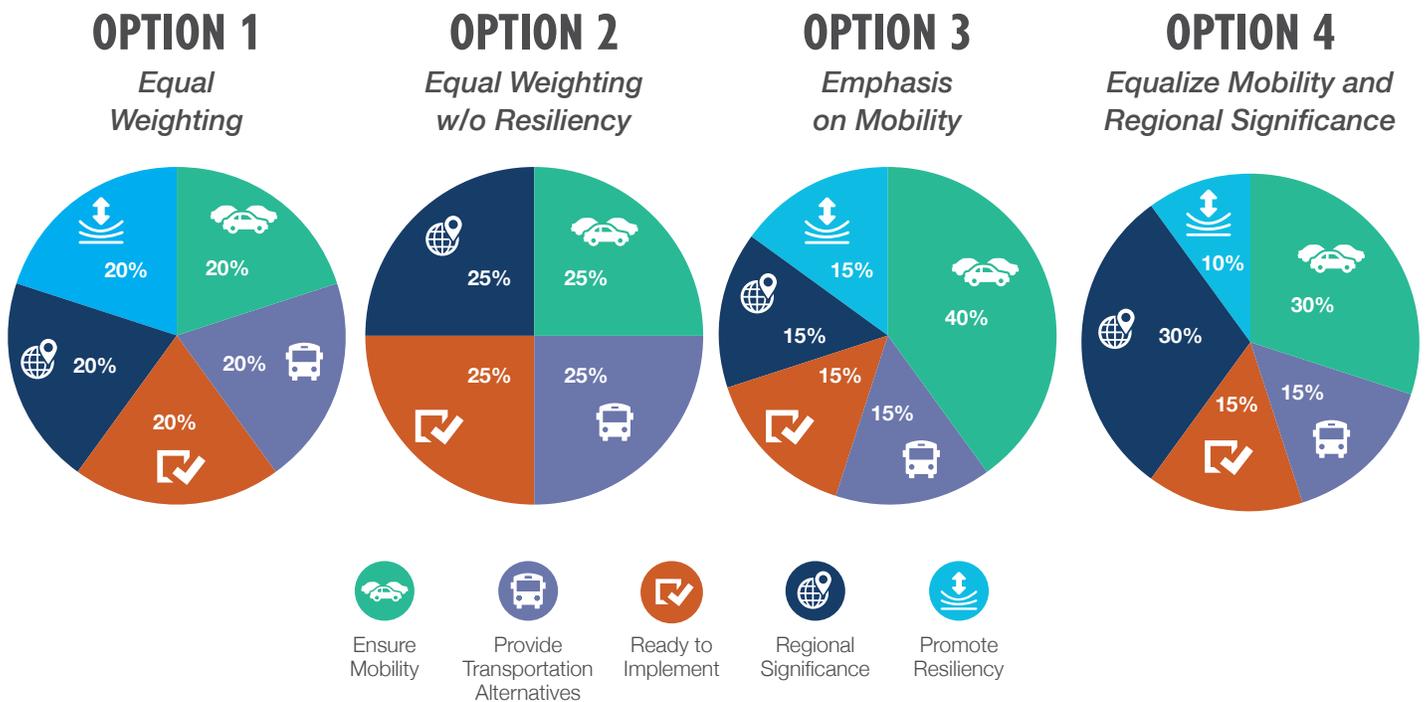
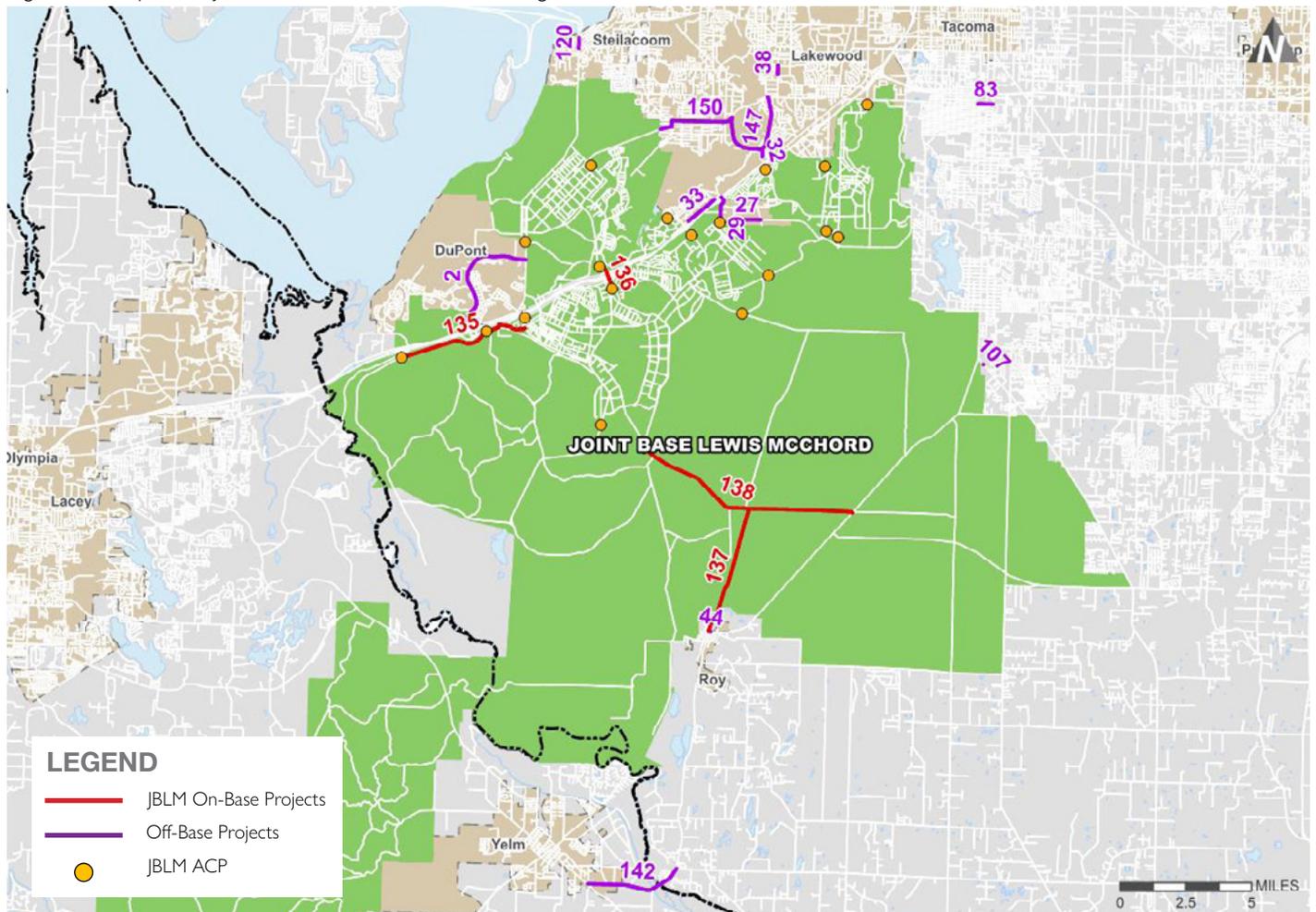


Figure 16. Outcome of Level Two Screening Process



Figure 17. Map of Projects Carried into Level 3 Screening



LEVEL THREE SCREENING

The Level 3 screening process was intended to further narrow the project list to a prioritized series of improvements to be recommended for funding by SSMCP.

Level 3 Criteria for Screening Capital Projects

Level 3 screening was based on criteria that attempted to address in greater detail how each remaining project is expected to meet the purpose and need of the project. Two sets of criteria were developed, the first of which focuses on evaluating and ranking capital improvement projects. The second set of criteria focuses on policy or study projects. Each of these criteria are summarized in Table 22 and further defined in the paragraphs that follow.



**ENSURE
MOBILITY**



**READY TO
IMPLEMENT**



**MINIMIZE
ENVIRONMENTAL ISSUES**



**ENHANCE
SAFETY**



**SERVE JBLM
PRIORITY GATE**



**GEOGRAPHIC
EQUITY**

Table 22. Criteria for Level 3 Transportation Capital Project Evaluation and Prioritization Project

CRITERIA	EVALUATION
Ensure Mobility	Does the project improve vehicular mobility in the affected corridor?
	Does the project improve multimodal circulation in the affected corridor?
Ready to Implement	Is the project a high priority for sponsoring jurisdiction?
	Would funding provide the impetus necessary for the project to advance?
	Is the project clearly defined?
Minimize Environmental Issues	What would be the potential magnitude of natural environmental impacts, mitigation and permitting?
	What would be the potential magnitude of impacts on the built environment?
Enhance Safety	Does the project serve an area with an identified safety concern?
	Would the project help address existing safety concerns?
Serve Priority JBLM Gate	Does the project improve access to JBLM priority gates?
Provide Geographic Equity	Does the project short list ensure diversity of jurisdictions?



Ensure Mobility

This criterion would measure how effective the project would be in improving mobility in the affected corridor. Two metrics

were used – improvements in vehicular operations (measured in terms of delay) and improvements to the multimodal system (measured in terms of potential transit riders, bicyclists, and pedestrians).

Vehicular Mobility Benefits

Project-related benefits to vehicular mobility were measured in terms of the potential reduction in delay that could be attributable to the project. These estimates were developed using a multistep process as follows:

- Step 1: Estimates of delay were produced for conditions with and without the project with the difference reflecting the magnitude of an expected benefit. This analysis was based on future year PM peak hour conditions and relied on several data sources including the JBLM travel demand model developed for the study area, forecasts from local transportation plans or project specific traffic analysis.
- Step 2: Expected improvements in vehicular delay for each project were divided by the sum of benefits estimated for all other projects to determine how each project ranked in comparison with the others. Based on this calculation, points ranging from 0.0 to 3.0. With zero points no specific benefits were expected with a particular project. 3.0 points represented the high end of potential project benefits.
- Step 3: Based on the project-related points calculated under Step 2, each project was scored

in the manner identified in Table 23. Results were stratified as High, Medium, and Low with scores ranging from zero (representing the least benefits) to three (representing the greatest potential benefits).

Multimodal Benefits

The estimation of multimodal benefits for each project was based on its potential positive effect on transit ridership, bicyclists, and pedestrians. Analysis used a five-step process as described below:

- Step 1: Journey to Work (JTW) data from the 2010 US Census was used to determine the likely modal split for each Census Tract within the study area. Identified data included vehicular, transit, bicycle, and pedestrian trips. Other modal trips that were included in the JTW data were not considered in this analysis. The relevant Census Tract for each project was identified and mode split percentages relevant to that project were determined.
- Step 2: Census Tract population was identified, and relevant mode split percentages were applied to this number to estimate the potential market for vehicular, transit, bicycle, and pedestrian trips that could be associated with each project within that Census Tract.
- Step 3: A qualitative determination was made as to whether a project could potentially benefit transit, bicycle, or pedestrian trips with Yes scoring 1 point and No scoring zero points.
- Step 4: Multiplying the population data derived under Step 2 by the Yes/No qualitative assessment determined under Step 3, resulted in an estimate of the number of persons who could potentially benefit from transit, bicycle or pedestrian enhancements associated with each project.

Table 23. Mobility Criteria Scoring

VEHICULAR DELAY	SCORE	MULTIMODAL PATRONAGE	SCORE
No Benefit	0	No Patronage	0
Moderate Impact	1	Low (1.0 to 1.5 points)	1
High Impact	2	Medium (>1.5 to 2.0 points)	2
Cannot be Determined	3	High (?2.0 points)	3

- Step 5: The result of Step 4 for each travel mode was totaled to identify a total potential multimodal travel market associated with each project. Multimodal benefits were scored based on their comparison with all projects as identified in the table above. Results were stratified as High, Medium, and Low with scores ranging from zero (representing the least benefits) to three (representing the greatest potential benefits). Projects where a multimodal benefit was not identified were scored as 0.

The vehicular and multimodal scores identified for each project based on the foregoing analysis were added to identify a total mobility score for each project. Total mobility scores ranged from a low of zero to a high of six as shown in Table 23.

 Details of the mobility scoring process are included in Appendix D.



Readiness to Implement

Readiness to implement was measured based on input from the sponsoring jurisdiction

and addressed three key questions:

1. Is the project a high priority for sponsoring jurisdiction?
2. Would identification of the project for the SSMCP funding source provide the fundamental impetus needed to advance the project, or could the project likely proceed with other funding sources?
3. Is the project sufficiently defined to allow evaluation?

Results were stratified as Yes or No and scored as identified in Table 24. Values were added to obtain an aggregate score for this evaluation criterion. This final score ranged from zero to

six with the latter reflecting projects that are expected to be the most “ready-to-implement”.

Factors that were considered in conducting this screening focused on the approach for each question that is described below:

- **Agency High Priority** - A key indicator that was used to identify agency priorities related the projects going through Level 3 screening was whether the agency’s Transportation Improvement Program (TIP) included funding for the project within the next five to six years and whether the agency was seeking additional funding to complete the project. In addition, conversations were held with key agency staff related to the importance of each project relative to other agency projects in the local TIP. Based on this assessment, at least one project was identified as a priority for each jurisdiction.
- **Funds Needed to Advance the Project** – To determine the relative importance of funding under the DOD program, agency staff and the TIP were consulted, and an assessment was made of the likelihood of alternative funding and/or project development opportunities being available to advance a project. In many instances it appeared that project could be developed using other sources of funding and that agency staff had the resources necessary to carry out project development activities without DOD funding. Four projects were identified as likely being dependent on DOD dollars as a condition of advancing to implementation.
- **Project Clearly Defined** – The third factor considered in the assessment of “Readiness to Implement” related to how clearly the project had been defined. The objectives and component elements of some projects were very clear while others would likely require some or even a lot of further analysis to arrive at a concise project

Table 24. Readiness to Implement Criteria Scoring

AGENCY HIGH PRIORITY	SCORE	ADVANCE PROJECT	SCORE	PROJECT DEFINED	SCORE
Yes	2	Yes	2	Yes	2
No	0	No	0	No	0

definition. In most instances, projects were clearly defined either in TIPs or in Regional Transportation Plans. In a few instances, project definition was more aspirational and would require substantial refinement, as well as concurrence regarding project need from other teaming partners.



Minimize Environmental Issues

The potential effect of a project on the environment was evaluated using a GIS-based assessment of key built and natural environmental features in each project area.

Evaluation of Potential Natural Environmental Impacts

For the natural environment evaluation included the following metrics:

- Mapped stream crossings or wetland areas
- Unstable lands
- Hydrological impacts
- Archaeological resources
- Priority species habitat

Each of these factors may require permitting and/or mitigation, some of which could be substantial and could affect both the cost and timeline of project implementation. Scoring was based on comparison of analysis results for each project in relation to all other projects as measured by such data as number of stream crossings and/or square footage of potential impact for the other metrics. It should be noted that this analysis is based on the best available information from GIS files or aerial mapping and does not reflect a precise estimate of the potential impact area of each project, field reconnaissance results, or in-depth literary research. Where square footage estimates of potential impacts were calculated, only data within the existing roadway right of way was considered as specific details about

right of way expansion requirements for any project could not be ascertained at this level of analysis.

Scoring of potential natural environmental impacts was based on points assigned to reflect the magnitude of potential impact for each metric. For streams, scoring was based on the number of crossings. For the other metrics scoring was based on various ranges of square footage impacts that differed for each metric, reflecting a relative comparison among all of the projects.



Details of this scoring approach are provided in Appendix E which summarizes the environmental evaluation process.

The points assigned for each metric typically ranged from one through five which were added to identify a point total for potential natural environmental impacts. Total points ranged from a low of zero to a high of 15, with a lower point total reflecting the least potential environmental impact and/or project risk, while the highest point totals reflect the highest potential risk. Point totals were translated into project scores of one to three, consistent with the scoring approach of all other evaluation criteria. The range of points that characterize High, Medium, and Low potential environmental impacts are illustrated in Table 25. A maximum score for the natural environmental evaluation was three.

Evaluation of Potential Built Environmental Impacts

Evaluation of the potential impact of a project on the built environment focused on areas outside of the existing roadway right of way and considered three primary metrics:

- Potential visual impacts
- Potential need for property acquisition
- Potential impact to structures

Table 25. Environmental Criteria Scoring

NATURAL RESOURCE IMPACTS	POINTS	SCORE	BUILD ENVIRONMENT IMPACTS	SCORE
Potential Low Impacts	0-4	3	Potential Low Impacts	3
Potential Medium Impacts	>4-9	2	Potential Medium Impacts	2
Potential High Impacts	>9	1	Potential High Impacts	1

Analysis was based largely on review of aerial mapping in the project area and qualitatively considered both the existing built environment in the vicinity of a project and the likelihood that the project would impact areas outside of the right of way. Points were assigned based on the assessment of each metric for each project based on a Yes/No impact determination, with Yes being awarded zero points and No being awarded one point. The points for all three metrics were added and scoring was conducted as identified in Table 25. A maximum score for the built environmental evaluation was three. Coupled with the natural environmental scores, projects could score anywhere from zero to six with six reflecting projects that are expected to have the least environmental impact or associated project risk due to environmental factors.

evaluated to identify predominate crash types, locations or contributing factors and to determine if the project would reasonably offer a potential safety benefit. Most projects would be expected to have at least a nominal benefit for safety, but some may have more significant benefits at locations where crash rates were higher and/or there was a history of serious injury crashes or fatalities.

Potential project safety benefits were scored as shown in the following table. The values in each scoring column were multiplied to identify a final safety score. This final score ranged from zero to six with the latter reflecting projects that are expected to address locations where there is a significant existing safety problem.

 Details about the safety criteria scoring process are included in Appendix F.



Enhance Safety

The safety benefits of proposed projects were assessed using the following approach:

Step 1: Crash rates were developed rates for each project influence area (i.e., intersection or corridor) using available traffic volume information and the most recent five year crash data covering the period between January 1, 2015 and December 31, 2019. Severity of crashes was also reviewed to identify if serious injury and/or fatal collisions had occurred within the project area.

Step 2: Crash rates were stratified into ranges to reflect the magnitude of the existing safety problem in the project area. These ranges were associated with an assessment of high, moderate, and low existing crash experience as summarized in Table 26.

Step 3: For each project that could have a potential safety benefit, the prevailing crash problem(s) were



Serve JBLM Priority Gate

This criterion focused on determining the extent to which a project improves access to one or more of JBLM's priority gates based on a list provided to the team by JBLM staff in April of 2020. The details of this list are presented in Table 27.

Scoring for this criterion included points to reflect the following two factors:

- How JBLM identifies the importance of the gate which is assumed to be served by the project
- The proximity of the project to its closest gate and the directness of travel between the project and that gate.

In most instances, the gate assumed to be served by the project would be the physically closest gate. However, based on input from JBLM, it was assumed

Table 26. Safety Criteria Scoring

EXISTING SAFETY PROBLEM	SCORE	EXPECTED PROJECT SAFETY BENEFITS	SCORE
Significant Crash History - crash rate above 5.0 or serious injury/fatal collision(s)	3	Safety issues specifically addressed by project	2
Moderate Crash History – crash rate 1.0 to 5.0	2	Expected nominal safety benefit	1
Low Crash History – crash rate less than 1.0	1	No expected safety benefit	0

that the D Gate would not be operational in the longer-term, so this gate was not included in the analysis. Additionally, it was assumed that the Main Gate flyover project (#136) would not affect or benefit the gate to Lewis Main but would benefit the gate to the North Lewis facility. Thus, the priority of the 41st Division Gate (Priority #2) was used for this evaluation.

Scoring of criteria related to JBLM priority gate access is presented in Table 28. The two scores were added to identify a single aggregate score for this criterion. Scores ranged from a low of zero (to reflect the finding that the project would likely have little benefit for JBLM gate access to a possible high of six reflecting projects that could significantly benefit JBLM access.



Provide Geographic Equity

The purpose of this criterion is to promote the widest spread of funding opportunities among the state, regional and local jurisdictions in the vicinity of JBLM. Scoring occurred after all other criteria have been assessed and limited each jurisdiction to no more than two projects in the final recommended project shortlist.

Table 27. JBLM Access Gates in Priority Order

JBLM ACCESS CONTROL POINT (GATE)	LOCATION	JBLM PRIORITY	HOURS OF OPERATION
Liberty Gate to Lewis Main	I-5/Exit 120	1	24/7
Madigan Gate to Army Medical Center	I-5/Exit 122	1	27/7
McChord Gate to McChord Field	I-5/Exit 125	1	24/7
41st Division Gate to Lewis North	I-5/Exit 120	2	24/7
East Gate which connects to SR 507 on the east side of the base	East Gate Road	2	24/7
DuPont Gate to Lewis Garrison	I-5/Exit 119	2	M-F 5am-9pm S+S 8am-9pm
D Street Gate to Lewis North ¹	Steilacoom-DuPont Road	3	M-F 5am-9pm S+S 8am-9pm
Integrity Gate to Lewis North	Steilacoom-DuPont Road	3	M-F 5am-7pm
Barnes Gate to McChord Field	Perimeter Road	3	5am-8pm
Transmission Line Gate to Lewis Main	Transmission Line Road	4	5:30am-6pm
RCF Gate to Lewis Garrison	Mounts Rd in/ Center Drive out	4	M-F 5-8am in/3-7pm out
Woodbrook Housing Gate to McChord Field Housing	I-5/Exit 124	4	M-F 5-9am/3-6pm S+S 8am-5pm

1. Gate has been closed during COVID-19 lockdown and is likely to be permanently closed.

Table 28. JBLM Priority Gate Access Criteria Scoring

PRIORITY OF PHYSICALLY CLOSEST GATE	SCORE	DISTANCE/DIRECTNESS TO GATE	SCORE
Priority #1	3	Direct route in relatively close in proximity to a gate	3
Priority #2	2	Direct route located relatively further from a gate	2
Priority #3	1	Neither on a direct route or in close proximity	0
Priority #4	0		

Screening Results for Capital Projects

Based on the Level 3 screening process discussed above, seventeen capital improvement projects were evaluated and ranked according to how well they maximized their potential benefits and minimized potential impacts in meeting the overall goal of improved access to JBLM. The results of this screening process are organized by jurisdiction and presented in Table 29.

Table 29. Level 3 Projects

PROJECT NO.	PROJECT NAME	LIMITS	DESCRIPTION
City of Dupont			
2	Center Drive Traffic Signal/Interconnect	I-5 Exit 118 to Steilacoom-DuPont Road	Traffic signal coordination
City of Lakewood			
27	150th Street Corridor	Spring Street to Woodbrook Drive	Widen, ped/bike facilities
29	Murray Road Corridor	1-5 to 15th Street	Widen, ped/bike facilities
32	Gravelly Lake Drive	Pacific Hwy to Nyanza Road	Curb, gutter, sidewalk, bike lanes
33	Union Avenue	Thorne Lane to Spruce Street	Turn lane, sidewalk, bike lanes
38	Gravelly Lake Drive	At Avondale Road	Traffic signal
147	Nyanza Road SW	Gravelly Lake Dr to Gravelly Lake Dr	Curb, gutter, sidewalk, bike lanes
150	Washington Blvd	North Gate Road to Gravelly Lake Dr	Curb, gutter, sidewalk, bike lanes
Town of Steilacoom			
120	Union Avenue	At Rainier Street	Roundabout
Pierce County			
83	112th Street Corridor	A Street to C Street	Widen, turn lanes, sidewalks
City of Roy			
44	SR 507/Water Street	SR 507 to Muck Creek Bridge	Curb, gutter, sidewalk, bike lanes
JBLM / SSMCP			
135	Perimeter Road	Mounts Road to Kaufman Avenue	Widen and enhance
136	I-5/Main Gate	Lewis Main to Lewis North over I-5	Connect via flyover to avoid interchange
137	Roy Cutoff Road	East Gate Road to Roy City Limits	Widen, non-motorized
138	East Gate Road	East Gate ACP to SR 507	Widen, non-motorized
Pierce Transit			
107	Pacific Avenue	Pacific Avenue at SR 7	Park-and-ride lot/bus turn-around
WSDOT			
142	SR 507	Bald Hills Road, Vail Road, SR 702	Three roundabouts

Weighting Analysis for Capital Projects

The project list presented in Table 29 was based on equal weighting of the five evaluation criteria discussed in this report. However, based on input from the project’s Transportation Working Group (TWG) and individual stakeholders, consideration was also given to various other weighting options. These options were intended to identify how project priorities might change if more emphasis was given to a specific criterion. A total of four weighting options were considered, one of which was carried forward for further discussion with the TWG along with equal weighting. This option emphasized the importance of projects that would improve mobility and be the most-ready to implement. The two weighting options used to assess capital projects are illustrated in Figure 18.

The results of Option #1 (Equal Weighting) and Option #2 (Emphasize Mobility/Ready to Implement) are presented in Table 30 and have been combined to provide an aggregate priority ranking. While the scores identified under the two weighting options provide a direct indicate of priority ranking, the combined weighting score reflects the average of all scores received for each evaluation criterion.

As indicated in Table 30, there are clear break-points between the top three ranked projects, the next three projects and the remaining ten projects. As also noted in the table, project #33 has been dropped from the priority list in conformance with the Geographic Equity criterion described earlier in this report. Based on this criterion, a single jurisdiction may have no more than two projects advance into the final, prioritized project list.

Figure 18. Weighting Options for Level 3 Screening

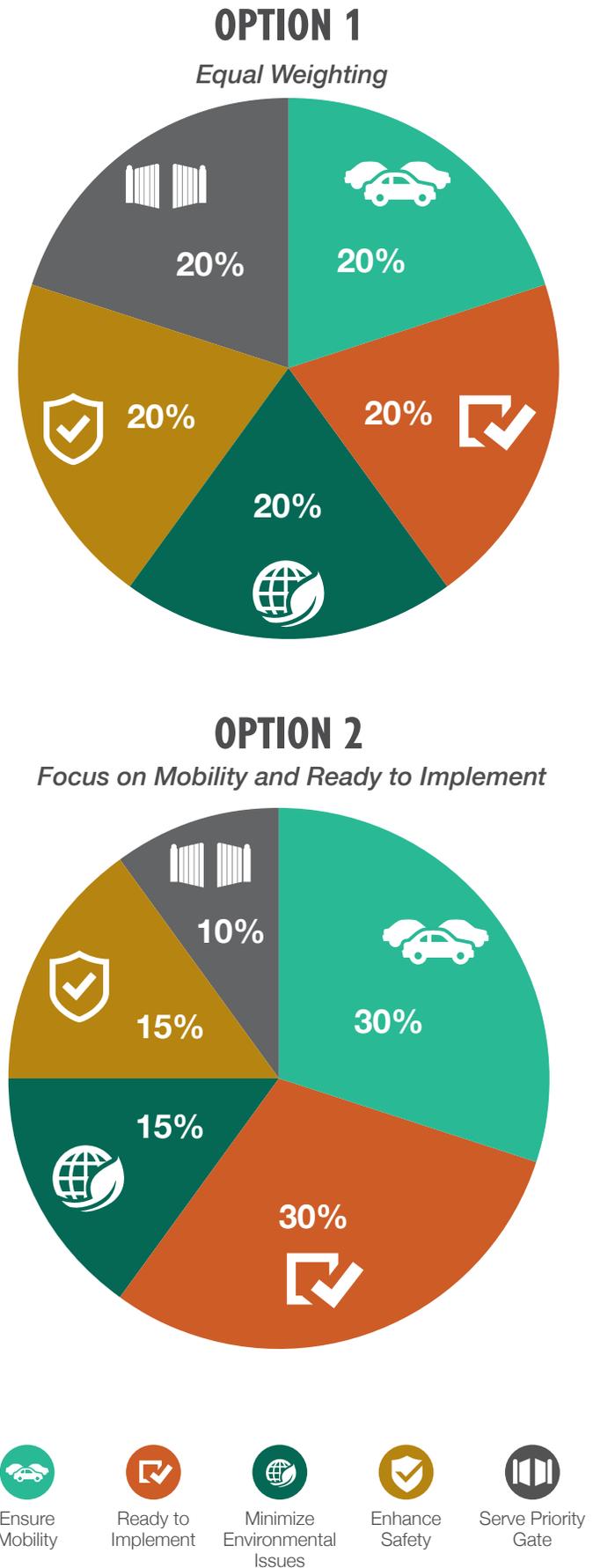


Table 30. Comparison of Project Weighting Options

PROJECT NO.	PROJECT NAME	OPTION #1	OPTION #2	COMBINED WEIGHTING	JURISDICTION	ESTIMATED COST
150	Washington Blvd	1	1	9.0	City of Lakewood	\$19,000,000
44	SR 507/Water Street	1	2	8.5	City of Roy	\$2,000,000
142	SR 507 Roundabouts	1	3	8.4	WSDOT	\$19,000,000
2	Center Drive Traffic Signal/Interconnect	5	4	7.7	City of DuPont	\$360,000
27	150th Street Corridor	4	6	7.5	City of Lakewood	\$2,150,000
83	112th Street Corridor	7	5	7.2	Pierce County	\$5,200,000
137	Roy Cutoff Road	8	9	6.6	JBLM	Unknown
120	Union Avenue/Rainier Street Roundabout	11	8	6.4	Town of Steilacoom	\$1,141,000
136	I-5/Main Gate Flyover	9	10	6.1	JBLM	\$135,000,000 ¹
29	Murray Road Corridor	9	10	6.1	City of Lakewood	\$1,648,000
32	Gravelly Lake Drive Corridor	11	12	5.7	City of Lakewood	\$1,792,000
38	Gravelly Lake Drive/Avondale Road Signal	13	13	5.3	City of Lakewood	\$773,000
138	East Gate Road	13	16	4.8	JBLM	Unknown
147	Nyanza Road SW Corridor	15	15	4.7	City of Lakewood	\$4,666,000
107	Pacific Avenue Park-and-Ride	16	14	4.6	Pierce Transit	\$10,000,000
135	Perimeter Road Corridor	16	17	3.9	JBLM	Unknown

1. This project has been rescoped as a \$1.5 million study to further refine project elements, see Table 31.

Note 1: Option #1 reflects equal weighting of the five evaluation criteria, while Option #2 reflects emphasis given to mobility and readiness to implement scores.

Note 2: Project #33 has been crossed off the priority list the application of the geographical equity criterion which provides that a single jurisdiction may have no more than two projects identified on the priority list.

Screening Analysis for Policy/ Study Projects

For the Level 3 screening process, policy/study projects were qualitatively assessed to identify their potential benefits to improved JBLM access relative to each other. This qualitative assessment is summarized in Table 31 and discussed in the paragraphs below:

- #141 – WSDOT, I-5 Tumwater to Mounts Road Alternatives Analysis, Tumwater to Mounts Road: Complete NEPA on planning study (\$2,500,000). The scope and scale of this study includes a significant length of interstate highway which accesses JBLM at its southernmost entrance. The purpose of this study is to address highway congestion and safety issues to enhance a broad spectrum of freight and passenger mobility. This would incidentally also improve access to JBLM from the growing areas of Thurston County where a high percentage of JBLM civilian staff and military personnel live. When compared with some of the other policy projects or studies evaluated in the Level 3 screening, this study is not solely driven by JBLM access needs and would likely be conducted regardless of funding availability that could be enabled with SSMCP advocacy.
- #148 – City of Lakewood, Clover Creek Floodplain Study: study and evaluate methods to prevent Clover Creek flooding of NB/SB I-5 from Bridgeport Way to railroad trestle north of 47th Avenue SW (\$75,000). Based on input received from WSDOT, the need for this project may not be evident. The study is also a low cost study, that

Lakewood could likely fund using existing City resources, and is not necessarily a project that needs to be widely advocated for by the SSMCP.

- #149 – JBLM/SSMCP, Perimeter Road Corridor Study, Military Road to Barnes Gate: develop project concept for improved multimodal public access through the corridor and to/from Barnes Gate (\$350,000). This project was evaluated using some of the criteria identified for capital projects (including priority gate service, safety, and readiness to implement) and scored well. It is anticipated that it may also have scored well using mobility and environmental metrics. Accordingly, there appear to be potential positive benefits to JBLM access that could accrue from an improvement to this portion of Perimeter Road and it is recommended for SSMCP advocacy.

In addition to these previously identified policy/study projects, review of project #136-Main Gate Flyover identified the need for a substantially further refined definition of project limits and component elements. This recommendation is consistent with a recent DDCA funding application submitted by SSMCP and JBLM for \$1,500,000 to conduct such a study. This project was ranked number 4 in the statewide application process. It is recommended that JBLM consider modifying the description for Project #136 in this report to first study the purpose and need for this improvement and to determine its optimal location and connections to the existing transportation system. If such a project is fully-funded through the DDCA process, then it should be dropped from the priority list of projects in this study effort.

Table 31. Summary of Screening Results for Policy/Study Projects

PROJECT NO.	STUDY NAME	DESCRIPTION	ESTIMATED COST	RANKING
141	WSDOT, I-5 Tumwater to Mounts Road Alternatives Analysis	Evaluate alternatives to improve capacity and safety along I-5 between DuPont and Lacey	\$2,500,000	3
148	Lakewood, Clover Creek Floodplain Study	Identify actions to prevent Clover Creek from flooding a portion of I-5	\$75,000	4
149	JBLM/SSMCP, Perimeter Road Study	Improve multimodal access along corridor from Military Road to Barnes Gate	\$350,000	2
136 Revised	Main Gate Flyover	Provide connection between Lewis Main and Lewis North in vicinity of I-5/Exit 120 interchange	\$1,500,000	1

An aerial photograph of a university campus. The campus features several large, multi-story brick buildings with gabled roofs, interspersed with green lawns and numerous evergreen trees. In the foreground, there are parking lots with several cars. The background shows a range of blue mountains under a clear sky. A white, trapezoidal graphic overlay is positioned in the upper center of the image, containing the text 'CHAPTER FIVE RECOMMENDATIONS' in a bold, dark blue font.

CHAPTER FIVE RECOMMENDATIONS

THIS CHAPTER

presents a summary of recommendations arising out of the three-step evaluation process described in Chapter 4.

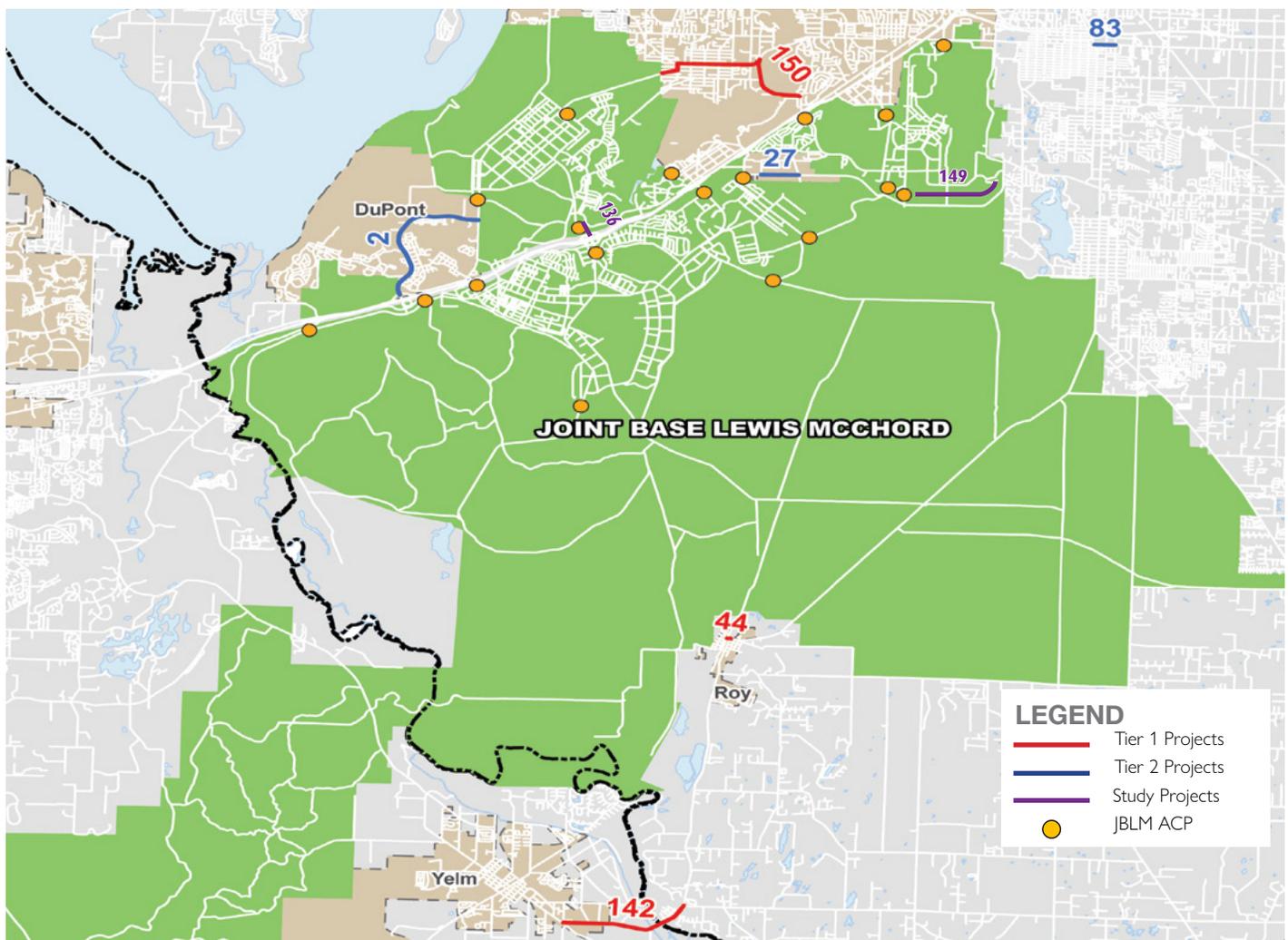
As noted previously, recommendations include a series of capital projects and studies that have been identified as best meeting the intended goals and purpose of improving access to and from JBLM. The focus of this effort has been on identifying enhancements to the arterial roadway system and supporting multimodal transportation facilities. The discussion presented in this chapter includes highlights of:

- Capital Project Recommendations
- Recommended Studies
- Implementation Strategies

CAPITAL PROJECT RECOMMENDATIONS

Based on the analysis process, findings, and conclusions of this report, it is recommended that a Two-Tiered approach be taken to prioritizing projects that should be advanced for funding with assistance from the SSMCP. Projects within the first tier would be recommended and supported by the Steering Committee and its associated jurisdictions to

Figure 19. Map of Level Three Screening Results



submit funding applications. Projects in the second tier would be recommended and supported by the Steering Committee and its associated jurisdictions for funding if a Tier One project drops off the list for whatever reason or if there is expected to be sufficient funding available to pursue grants for more than the top three projects. Recommended Tier One and Tier Two capital projects, along with recommended studies are illustrated in Figure 19, summarized in Table 32 and described in the following paragraphs.

As shown in Figure 19, six of the eight total identified projects are located on the north side of JBLM, near the I-5 corridor. One project is located south of JBLM near Roy, and one is located south of JBLM in Yelm. The projects are clustered around major points of entry into and out of the base, and focused on local arterial corridors off of I-5 but which provide important access to JBLM. All the project locations generally have a high proportion of JBLM traffic compared to project locations farther away from the installation. Additionally, all the projects are within or close to major population centers that surround the installation such as Lakewood, DuPont, and Yelm.

 Cut sheets that more fully describe each of the recommended Tier One and Tier Two projects are included in Appendix G.

Tier One

Tier One projects are summarized in Table 32 and described below. As shown in Table 32, recommended Tier One Projects include:

- #150 – Washington Boulevard, North Gate Road to Gravelly Lake Drive: Provide intersection improvements and curb, gutter, sidewalk and bike lane corridor improvements along with traffic control, street lighting, drainage and pavement overlay (\$19,000,000)
- #44 – SR 507/Water Street, SR 507 to Muck Creek Bridge: Provide curb, gutter, sidewalk, bike lane and traffic control improvements (\$2,000,000)
- #142 – SR 507 at Bald Hills Road, Vail Road and SR 702: Install roundabouts along SR 507 that would include improved pedestrian crossings (\$19,000,000)

Tier Two

Tier Two projects are summarized in Table 33 and described below.

As shown in Table 33, recommended Tier Two projects include:

- #2 – Center Drive, I-5/Exit 118 to Steilacoom-DuPont Road: Install traffic signal at Steilacoom-DuPont Road and interconnect/coordinate signals through the corridor (\$360,000)
- #27 – 150th Street Corridor, Spring Street to Woodbrook Drive: Widen street, add bike lanes and sidewalks, and center turn lane (\$2,150,000)
- #83 – 112th Street Corridor, A Street to C Street: Widen to provide left turn lanes, install pedestrian facilities and illumination (\$5,200,000)

Recommended Studies

Recommended studies are summarized in Table 34 and described below. Recommended studies include:

- #149 – JBLM/SSMCP, Perimeter Road Corridor Study, Military Road to Barnes Gate: develop project concept for improved multimodal public access through the corridor and to/from Barnes Gate (\$350,000)
- Modified #136 – Main Gate Flyover in Vicinity of I-5/Exit 120 interchange: identify purpose and need for this improvement and to determine its feasibility, including optimal location and system connections (\$1,500,000)



Table 32. Recommended Tier One Projects

PROJECT NO.	STUDY NAME	DESCRIPTION	AGENCY	ESTIMATED COST	RANKING
150	Washington Blvd/N. Gate Rd/Edgewood Ave SW Improvements	Construct curbs, gutter, sidewalks, traffic control, bike lanes, street lighting, drainage, overlay	City of Lakewood	\$19,000,000	1
44	JBLM Access from SR 507 to Muck Creek Bridge	Construct curbs, sidewalks, traffic control, bike lanes	City of Roy	\$2,000,000	2
142	SR 507/Bald Hills Rd to SR 702 Intersection Improvements	Construct roundabouts at Bald Hills Rd, Vail Rd and SR 702 intersections	WSDOT	\$19,000,000	3

Table 33. Recommended Tier Two Projects

PROJECT NO.	STUDY NAME	DESCRIPTION	AGENCY	ESTIMATED COST	RANKING
2	Center Drive Traffic Signal Coordination & Modernization	Traffic signal coordination for through traffic during peak periods from I-5 Exit 118 to DuPont Steilacoom-Rd	City of DuPont	\$360,000	4
27	150th Street Corridor Improvements	Widen to include bike/ped facilities, structural pavement improvements from Spring St to Woodbrook Dr	City of Lakewood	\$2,150,000	5
83	112th Street S Corridor Improvements	Widen to provide turn lane(s), install pedestrian facilities, and illumination from C St S to A St S	Pierce County	\$5,200,000	6

Table 34. Recommended Studies

PROJECT NO.	STUDY NAME	DESCRIPTION	AGENCY	ESTIMATED COST	RANKING
149	JBLM/SSMCP, Perimeter Road Study	Improve multimodal access along corridor from Military Road to Barnes Gate	JBLM/SSMCP	\$350,000	2
136 Revised ¹	Main Gate Flyover	Provide connection between Lewis Main and Lewis North in vicinity of I-5/Exit 120 interchange	JBLM/SSMCP	\$1,500,000	1

1. SSMCP requested \$1.5 million in funding from the State Defense Community Compatibility Account (DCCA) program in 2019.

IMPLEMENTATION STRATEGIES

To implement the six recommended projects and two recommended studies prioritized by the evaluation process, the following strategies can be used to promote the coordination and project funding advocacy that will be necessary for success:

- Establish and maintain coordination among agencies
- Conduct on-going monitoring using the established Transportation Working Group (TWG)
- Carry out Legislative Advocacy
- Identify and Pursue Funding Sources

Recommended implementation strategies are summarized below.

Agency Coordination

The six recommended projects and two recommended studies fall under the jurisdiction of six agencies: the City of Lakewood, the Town of Roy, WSDOT, the City of DuPont, Pierce County, and JBLM/SSMCP. These agencies will need to continue to coordinate and partner with SSMCP and adjoining agencies to move the recommended projects forward. Partnerships can include the pursuit of joint funding applications, grants, legislative appropriations and other outside funding. Together, agencies can increase the potential to receive grants for the recommended projects. In addition, agencies can incorporate and acknowledge the recommended projects in their future planning documents, such as Transportation Improvement Programs and long-range plans.

Transportation Working Group Monitoring

Monitoring the recommended projects on a regular basis can provide an opportunity for stakeholders to frequently check in and advocate for a project's funding and implementation. The SSMCP meets regularly as a Transportation Working Group (TWG). Through these meetings, leads can be identified to track and monitor how each project is progressing. Continually assessing the progress of these key projects within a regularly scheduled meeting setting will encourage communication and further coordination to shepherd the projects to completion.

SSMCP Legislative Advocacy

Legislative advocacy from the SSMCP will be required to promote funding and implementation of the recommended projects. The recommended projects will require funding from both state and federal governments. To secure this funding, the SSMCP will need to advocate for the recommended projects within the partnership's legislative priorities. In addition, the SSMCP can advocate with local agencies to include these projects in agency legislative priorities as well. Through regular advocacy from the SSMCP, project funding can be secured from a variety of sources.

Identify and Pursue Funding Sources

A new funding source or combination of local revenues may be needed to fund the identified projects and studies. For example, DOD OEA funds can be pursued for the study projects. This funding source is similar to that which was used to conduct the evaluation documented in this report. The two study projects recommended in this study would be good candidates for federal DOD OEA funding.



For more information

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