

CHAPTER 3

Transportation



3 TRANSPORTATION

This chapter summarizes the existing transportation conditions in the study area for the Mukilteo Multimodal Project. It describes the transportation characteristics in the study area and discusses the multimodal connections occurring at the ferry terminal. It also discusses current and future traffic conditions, including ferry, bus, and rail ridership; vehicle and non-motorized volumes; intersection and ferry levels of service (LOS); and safety.

The impact analysis considers long-term changes in terminal operations, the roadway network, non-motorized systems, public transportation, parking, and freight. This chapter also describes the long-term construction impacts associated with each alternative, and identifies planned projects in the vicinity of the Mukilteo ferry terminal that, when combined with the impacts of the Mukilteo Multimodal Project, could contribute to cumulative impacts. Potential mitigation activities are also described that would reduce the impacts of the effects associated with the Mukilteo ferry terminal alternatives.

3.1 Overview of Analysis and Regulatory Context

This section provides a brief overview of analysis methodology and regulatory context; the *Transportation Discipline Report* for this Final EIS contains additional information about the system and design standards assumed in the analysis.

The analysis of local traffic impacts was guided by the policy direction established in the numerous plans or policy documents adopted for the Mukilteo/Everett area. These include, but are not limited to, the Puget Sound Regional Council (PSRC) *Transportation 2040 Plan* (PSRC 2010), *Comprehensive Plans* for the cities of Mukilteo and Everett (City of Mukilteo 2012; City of Everett 2012), the *Six-Year Transportation Improvement Program* for the cities of Mukilteo and Everett (City of Mukilteo 2008; City of Everett 2011), and Community Transit's *Long Range Transit Plan* (Community Transit 2011a).

The transportation analysis uses a variety of technical tools and approaches to evaluate transportation performance across all modes. This evaluation includes forecasts of future travel by mode, as well as travel times and delays, including intersection delays. Travel forecasts are an estimation of how many people will travel in a future year and how those people will choose to travel. To develop travel forecasts for a roadway and ferry network, two demand models were used:

1. *WSDOT Ferries Division Final Long-Range Plan 2009-2030* model was used to determine ferry ridership and distribution of ferry passengers.
2. PSRC 2040 Regional model was used to determine traffic forecasts for the state and regional roadway network.

3.2 Affected Environment

This section summarizes existing transportation characteristics within the study area corridor along SR 525 and at the Mukilteo ferry terminal. It describes the existing road and non-motorized network, traffic volumes, bus and rail operations, parking,

ferry terminal operations and scheduling, ferry ridership, multimodal connections, and freight operations.

3.2.1 Mukilteo Ferry Terminal Facility

Sailings and Scheduling

Ferry service operates weekdays from 4:40 AM to 1:00 AM and weekends from 5:30 AM to 1:05 AM. Sailing time between Mukilteo and Clinton is approximately 15 minutes. Unloading and loading times vary based on the number of passengers and vehicles.

Ridership

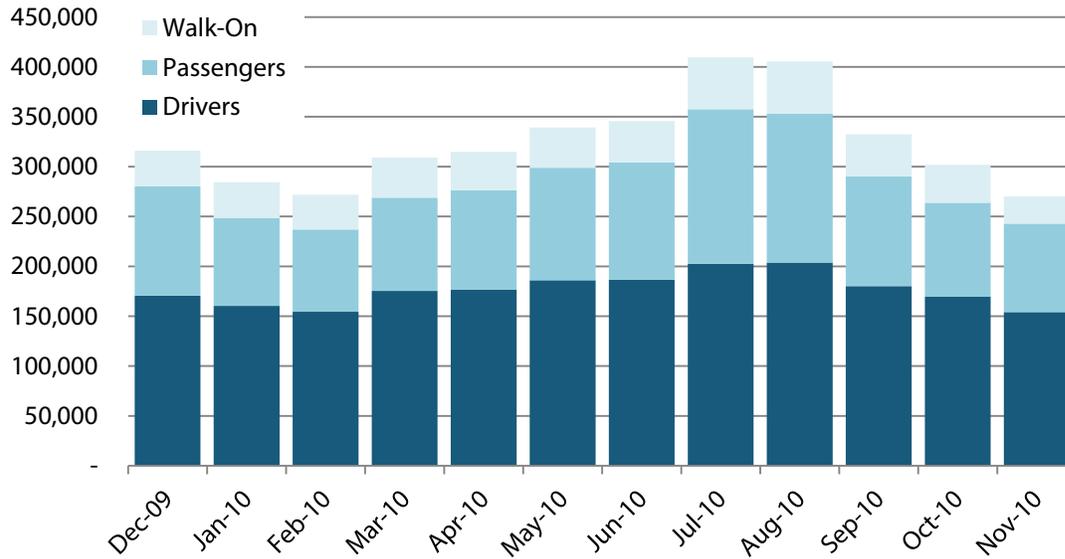
Two ferry vessels operate at a time on the Mukilteo-Clinton route. Each vessel has the capacity to carry up to 1,200 walk-on passengers and approximately 124 vehicles. The number of vehicles permitted on the ferry depends on the size of the vehicles on the ferry as well as how closely they are parked to one another.

In 2012, the Mukilteo-Clinton route had the most vehicle trips and the second-highest total annual ridership in the system (WSDOT 2012). More than 2,090,400 vehicles and 3,835,000 riders (vehicle drivers, vehicle passengers, and walk-on passengers) take the Mukilteo ferry each year.

Ferry ridership on the Mukilteo-Clinton route fluctuates throughout the year, with the highest ridership during July and August and the lowest ridership in November, January, and February (Figure 3-1). The typical or average month for ferry ridership is May.

Total ridership varies only slightly throughout the week (Tuesday through Thursday) and generally increases during the weekend (Friday through Saturday); Sunday and Monday ridership varies. However, walk-on ridership decreases on weekends while vehicle volumes increase, primarily because there are fewer commute trips and more recreational trips on weekends.

Figure 3-1. Monthly Mukilteo-Clinton Ferry Ridership Volumes (December 2009 to November 2010)



Ferry Crossing Levels of Service (LOS)

As a way to identify the point at which demand management or additional capacity investments may be necessary, the *WSDOT Ferries Division Final Long-Range Plan* (WSDOT 2009) identifies a LOS performance standard based on the percentage of total sailings operating at full capacity. When capacity exceeds the Level 1 Standard, the plan recommends pricing and operational measures to spread demand; it recommends additional service when capacity exceeds the Level 2 Standard (see Table 3-1).

Northbound travel in the PM peak period is used to calculate the ferry crossing LOS because it has an overall higher travel demand than the southbound AM peak period. Table 3-1 summarizes the percentage of sailings that were full in 2010 and shows that August exceeded the Level 1 LOS performance threshold but not for Level 2.

Table 3-1. Percent of Sailings at Full Capacity for the Mukilteo-Clinton Ferry Route

Month	2010 Observed Data	Level 1 Standard	Level 2 Standard
January	8%	25%	65%
May	20%	25%	65%
August	35%	30%	75%

Sources: WSDOT 2009; 2010 WSF Fare Box Data

Note: Values are percent of total northbound sailings that are full.

Terminal Operations

The Mukilteo ferry terminal accommodates multiple modes of traffic, each of which arrives at the terminal, loads and unloads, and departs in different manners.

Terminal Arrival

Walk-on passengers include people walking or bicycling from where their trip starts, drivers who park and walk, and transit riders who use bus and commuter rail. All walk-on passengers have an associated walking travel time to the SR 525-Front Street intersection, as well as some level of delay at this intersection prior to entering the passenger loading area. Table 3-2 summarizes the modeled travel times for walking among the Mukilteo Station, bus zone, southern parking lots, and the Mukilteo ferry terminal. The modeled travel times assume a standard distribution of walking speeds, which does not fully account for passengers walking quickly to reach their destinations.

Table 3-2. Walk Travel Times to the Mukilteo Ferry Terminal (PM Peak Period)

Location	To Terminal (minutes)
Mukilteo Station	8.6
Bus Zone/Parking Lot South of Front Street	1.0
Parking Lot South of Second Street	4.8

Source: VISSIM Model 2012

Unlike most other ferry terminals, ferry and non-ferry vehicle traffic are not separated at the Mukilteo ferry terminal area. The Mukilteo ferry terminal transfer span connects directly to the SR 525-Front Street intersection. The intersection is stop-controlled except during ferry offloading when a signal is used to hold traffic on Front Street while WSF staff manage offloading. Front Street and SR 525 also serve non-ferry traffic traveling to destinations along the waterfront. These destinations include Mukilteo Lighthouse Park, Mukilteo Station, Mount Baker Terminal, NOAA Fisheries Service Mukilteo Research Station, park-and-ride lots, private residences, public access and waterfront facilities, and businesses along Front Street.

Ferry Unloading and Loading

Walk-on passengers are allowed to walk off the ferry first while the vehicles remain on board. It takes, on average, 19 seconds for all passengers to reach the passenger terminal (see Table 3-3). Walk-on passengers who do not quickly cross the SR 525-Front Street intersection experience additional delay while the motor vehicles unload. Unloading motor vehicles takes just over 4 minutes, on average.

Table 3-3. Ferry Unloading and Loading Average Duration at Mukilteo

Ferry Arrival	Walk Off	Vehicle Unloading	Walk On	Vehicle Loading
Minutes	0:19	4:10	0:47	8:24

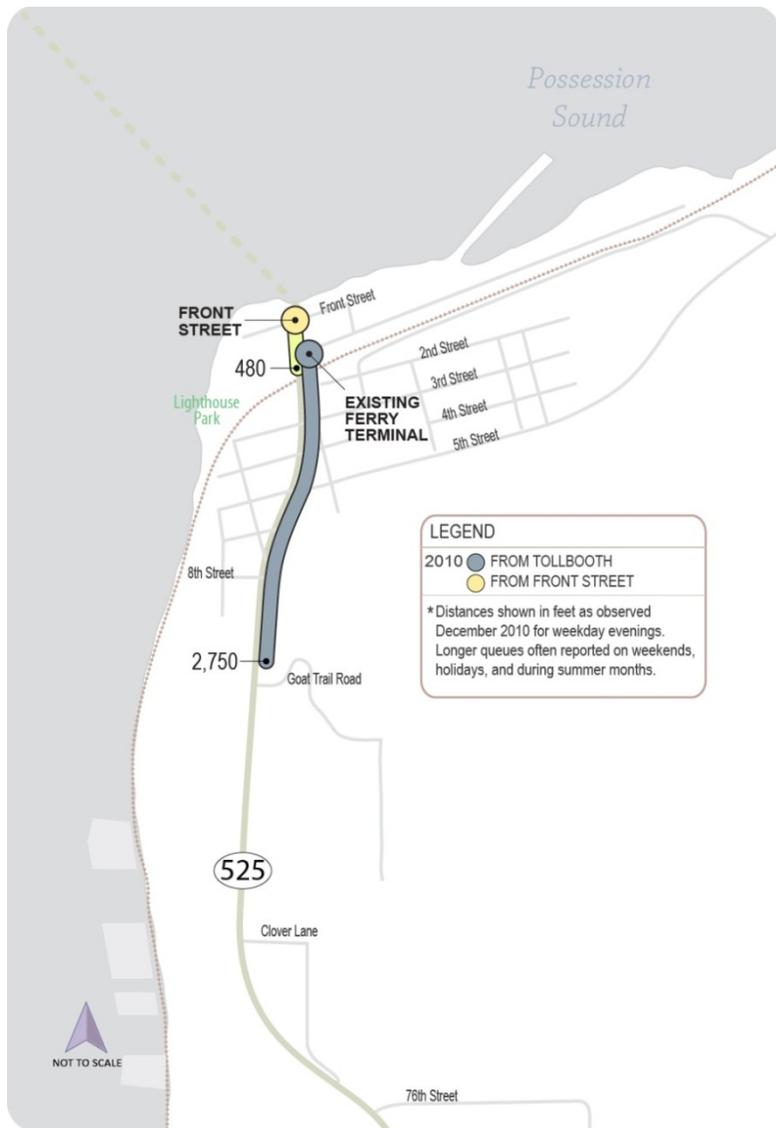
Source: Field Survey, December 2010

During the ferry unloading and loading processes, which take approximately 14 minutes, queues tend to form in the ferry lane and along SR 525.

Ferry Shoulder Queuing

Figure 3-2 shows queue lengths from a field survey in December 2010, which provided a representative baseline for the analysis (queues can be longer at other times such as Fridays, holidays, and during the summer, when ferry shoulder queues can extend beyond Goat Trail Road). Queue lengths are a metric for evaluating the roadway operations and they indicate if the operations of one intersection affect an adjacent intersection. The Front Street queue length represents the maximum extent that vehicles spill back onto SR 525 from the Front Street intersection during the peak hour, which includes at least one ferry loading and unloading operation. The queue length on SR 525, south of Front Street, is not long enough to affect downstream intersections. The shoulder queuing from the toll booths along SR 525 affects a number of downstream intersections and driveways, as vehicles move slowly through the shoulder lane during times of higher ferry use.

Figure 3-2. 2010 Queue Lengths along SR 525 at the Mukilteo Ferry Terminal



Source: Field Survey, December 2010

Terminal Departure

Walk-off passengers departing the Mukilteo ferry terminal experience additional delay at the SR 525-Front Street intersection due to local (non-ferry) traffic, and vehicle ferry traffic during loading and unloading operations. Table 3-4 summarizes the travel times for the different destinations of walk-off passengers (similar to Table 3-2, these modeled travel times assume a standard distribution of walking speeds).

Table 3-4. Walk Travel Times from the Mukilteo Ferry Terminal (PM Peak Period)

Location	From Terminal (minutes)
Mukilteo Station	12.8
Bus Zone/Parking Lot South of Front Street	2.1
Parking Lot South of Second Street	8.4

Source: VISSIM Model, 2010

The walk times departing the terminal are longer than the arriving walk times because walk-off passengers crossing SR 525 typically have to wait for unloading vehicle traffic to pass.

Navigable Waterways

The Rivers and Harbors Act defines navigable waters of the United States. The existing Mukilteo ferry terminal is situated in navigable waters and ferries traveling to and from Clinton across Possession Sound pass through an existing shipping lane. The existing Mukilteo-Clinton ferry route does not impede other vessels operating within or outside the shipping lane under general navigation rules.

3.2.2 Traffic Operations

Study area intersections are illustrated in Figure 3-3. As summarized in Table 3-5, during the PM peak period, the SR 525-88th Street SW and SR 525-Front Street intersections operate at an LOS E, which indicates a high level of delay. This LOS fails to meet the City of Mukilteo LOS D standard, which is the maximum level of delay the City has defined as acceptable. All other study intersections operate at LOS D or better during the AM and PM peak hours.

Figure 3-3. Study Area Intersections

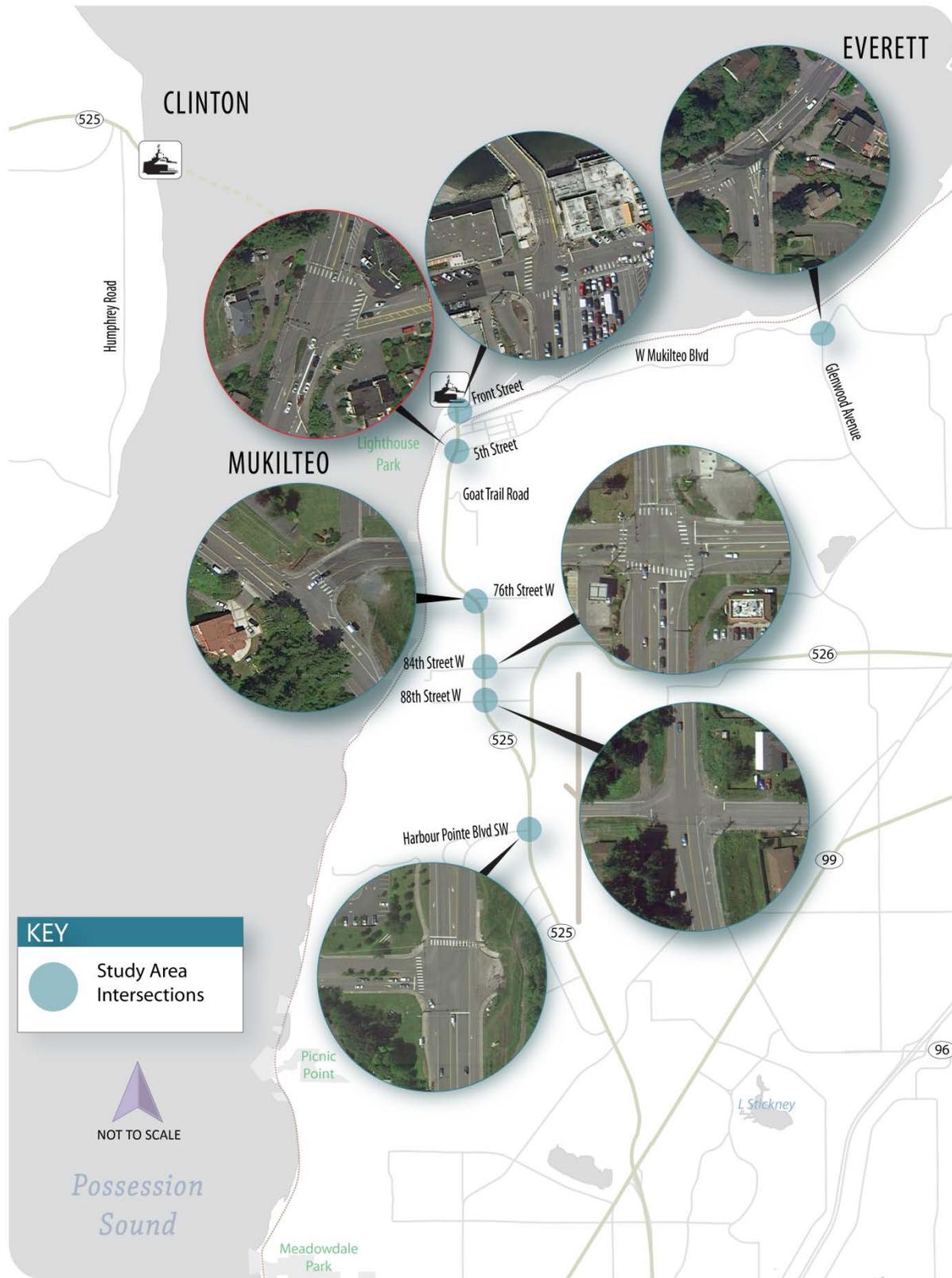


Table 3-5. 2010 LOS Summary

Intersection	Control Type	LOS Standard	AM Peak		PM Peak	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
SR 525/Harbour Pointe Boulevard North	Signal	D	C	23	C	21
SR 525/88th Street SW	Stop Sign	D	C	21	E	43
SR 525/84th Street SW and SR 526	Signal	D	A	6	C	28
SR 525/76th Street SW	Stop Sign	D	C	20	C	20
SR 525/5th Street	Signal	D	B	11	D	51
SR 525/Front Street	Stop Sign	D	n/a	n/a	E	48
West Mukilteo Boulevard/Glenwood Avenue	Signal	D	B	11	B	14

Sources: Existing 2010 Synchro Model and Existing 2010 VISSIM Model for SR 525-Front Street Intersection

n/a = not applicable; sec/veh = seconds per vehicle

3.2.3 Non-Motorized Conditions

Pedestrian Conditions

SR 525 is the only roadway link between the Mukilteo city center and the ferry terminal. The SR 525 pedestrian facilities crossing the BNSF tracks consist of 3-foot-wide sidewalks on both sides of the bridge. These facilities meet some but not all Americans with Disabilities Act (ADA) standards, and do not meet current WSDOT design standards for 4-foot-wide sidewalks.

Pedestrians accessing the ferry terminal or areas west of the terminal from the east side of the terminal must either wait for all vehicles to load or find a safe gap in the loading of vehicles.

Pedestrians who walk off the ferry prior to the vehicles have unrestricted access to cross Front Street. Common destinations include the parking lot behind Diamond Knot Brewery, the bus stop at the SR 525-Front Street intersection, the SR 525 bridge to Mukilteo and to other parking lots, and Mukilteo Station. Some passengers are picked up at the terminal.

The highest pedestrian flows between the Mukilteo ferry terminal and the bus stops occur during peak periods. Approximately 53 percent of all walk-off traffic in the AM peak period is from the ferry to the bus (compared to 12 percent that walk on), and 41 percent of walk-on traffic in the PM peak period is from the bus to the ferry (compared to 12 percent that walk off).

Bicycle Facility Conditions

There is limited bicycle use of the ferry terminal; most cyclists leave the Mukilteo ferry terminal in the AM peak period and return to board the ferry in the PM peak period. None of the streets to or from the ferry terminal has dedicated bicycle lanes. Cyclists can legally use the same roadway space as motorized vehicles. Cyclists disembarking from the ferry bound for Mukilteo or points to the east must ascend SR 525 in mixed vehicular traffic, sharing the outside travel lane. Some cyclists wait for all vehicles to finish unloading from the ferry before ascending SR 525.

3.2.4 Public Transportation Facilities

Community Transit, Everett Transit, Island Transit, and Sound Transit provide transit service in the study area, but only Island Transit operates service on Whidbey Island, serving the Clinton terminal. The primary transit corridors in the study area are SR 525, 5th Street and West Mukilteo Boulevard, SR 526, and the BNSF Railway line. In its *Transit Development Plan* (2012–2017), Community Transit has identified SR 525 as a *transit emphasis corridor*, which is a corridor intended for future service expansion (Community Transit 2011b).

Sound Transit operates Sounder commuter rail service with a station in Mukilteo. Although Amtrak rail service passes through Mukilteo, it does not stop at the Mukilteo Station. Bus service to and from the Mukilteo ferry terminal is operated by Community Transit and Everett Transit, which use a dedicated pull-out bus zone at the Front Street-SR 525 intersection. Community Transit operates a commuter express bus service and all-day local bus service, and Everett Transit operates local bus service. Vanpool service in Mukilteo is provided by Community Transit and Island Transit—there are currently four Community Transit vanpools and 36 Island Transit vanpools. Paratransit service is offered by Community Transit and Everett Transit, with an average of seven and two trips, respectively, to and from the Mukilteo ferry terminal.

Everett Transit and Community Transit have reported that transit buses regularly encounter deficiencies in the capacity of the bus zones. The primary bus zone, on southbound SR 525, just south of Front Street, accommodates only two buses at a time. Because six routes terminate at the Mukilteo ferry terminal and fare payment causes long wait times, arriving buses must proceed to Mukilteo Lighthouse Park to turn around, which is not a preferred location by the transit agencies or the City of Mukilteo.

Island Transit buses serve the Clinton ferry terminal on Whidbey Island and the park-and-ride lots nearby.

3.2.5 Parking

Near the Mukilteo ferry terminal, parking for various uses is provided at a number of locations, including on-street parking spaces, off-street parking lots that are for public or paid use, ferry employee parking, and dedicated Sound Transit parking for Sounder commuter rail. Figure 3-4 and Table 3-6 show the number and type of parking spaces in the Mukilteo ferry terminal vicinity.

On-street parking near the Mukilteo ferry terminal is regulated by two residential parking zones; parking permits are available to Mukilteo residents but not available to ferry commuters. The public parking area located in the southwest corner of the Front Street-Park Street intersection (Lot C) is reserved for Ivar's restaurant patrons. On-street parking on First Street east of Park Avenue (Lot E) is restricted to Mukilteo Station patrons.

Figure 3-4. Designated Parking Areas near the Mukilteo Ferry Terminal



Table 3-6. Parking Areas near the Mukilteo Ferry Terminal

Existing Parking at Mukilteo			
PARKING LOT	Parking Location		Notes
A	Southwest corner of SR 525 and Front Street	98	Off-Street private lot / paid (total does not include 5 vendor and 6 unmarked stalls)
B	Second Street between SR 525 and Park Avenue	40	Off-Street private lot / paid
C	Former Buzz Inn property (southwest corner of Front Street and Park Avenue)	n/a	This 45-space lot for Ivar's Mukilteo Landing is not included in totals because its use would be displaced
D	Port of Everett Mount Baker Terminal	30	Combined Port of Everett and public lot
E	Mukilteo Station Parking	63	Sound Transit park-and-ride lot
		Subtotal	231
ON-STREET			
F	First Street between SR 525 and Park Avenue	25	On-street / time restrictions / parking passes
G	Park Avenue between Front Street and First Street	18	On-street / time restrictions / parking passes
H	Front Street between SR 525 and Park Avenue	26	On-street / time restrictions / parking passes
		Subtotal	69
		Total Parking Lot and On-Street Parking Spaces	300
WSF PARKING			
I	WSF employee parking (west of SR 525)	20	
J	WSF employee parking (at Mukilteo ferry terminal)	23	WSF employees only
		Subtotal	43 WSF employees only

3.2.6 Freight

The BNSF Railway mainline runs generally along the eastern edge of Puget Sound and passes through the project area. This railway connects Seattle to British Columbia, Canada. Amtrak passenger rail and Sounder commuter rail share this railway with freight service. Only Sounder service stops at Mukilteo Station. The Port of Everett's Mount Baker Terminal is located to the east of the Mukilteo ferry terminal.

Truck freight uses multiple roadways in the study area, most notably SR 525. Between 4 million and 10 million metric tons per year are carried on the SR 525 corridor.

3.3 Transportation Effects

This section summarizes the transportation effects within the study area corridor along SR 525 and at the potential ferry terminal locations in Mukilteo. It describes the project's impacts on the existing motorized and non-motorized network, bus and rail operations, parking, ferry terminal operations and scheduling, multimodal connections, and freight operations.

3.3.1 Mukilteo Ferry Terminal

Sailings and Scheduling

For all alternatives, daily ferry service would continue, and sailing time between Mukilteo and Clinton would remain approximately 15 minutes each way. None of the alternatives would affect ferry scheduling for the Mukilteo-Clinton route.

Ridership

One set of future travel demand volumes was developed for all 2040 alternatives because none of the alternatives is likely to change the total number of people traveling or how they choose to travel.

Ferry Crossing Levels of Service

Table 3-7 summarizes the percentage of sailings that were full in 2010 and are estimated to be full in 2040. Forecasts were based on 2010 data and projected to 2040. By 2040, the travel forecasts indicate that capacity in all 3 analysis months (including January, a less busy month) would exceed the Level 1 Standard but not the Level 2 Standard. The impacts of this capacity forecast are longer travel times for passengers, longer peak periods, and longer queues on adjoining roadways.

The projected growth in travel led WSDOT to consider how best to address peak period travel demand and related impacts on this route, as described in *Chapter 1 Purpose and Need*. Because performance in 2040 is not anticipated to exceed the Level 2 Standard, the route does not warrant additional capacity investments above the already planned replacement of the current 124-vehicle ferries with new 144-vehicle ferries. Measures to manage demand to the Level 1 Standard are described in *Section 3.7.2*.

Table 3-7. Percent of Future Sailings at Full Capacity for the Mukilteo-Clinton Ferry Route

Month	2010 Observed Data	2040 Forecast	Level 1 Standard	Level 2 Standard
January	8%	32%	25%	65%
May	20%	48%	25%	65%
August	35%	58%	30%	75%

Sources: WSDOT 2009; 2010 WSF Fare Box Data; WSF Model Forecast

Note: Values are percent of total northbound sailings that are full in the PM peak period.

Terminal Operations

Access Lanes and Vehicle Holding Area

The No-Build, Existing Site Improvements, and Elliot Point 1 alternatives include a holding area that can accommodate approximately one and a half of the vehicle-holding capacity of the new ferries, which is approximately 216 vehicles. The Preferred Alternative includes a larger holding area, which accommodates approximately 266 vehicles and provides additional storage capacity during peak periods, particularly if all four toll booths are open.

Because the Preferred Alternative and Elliot Point 1 Alternative have fewer and longer holding area lanes plus a motorcycle bypass lane, HOV users and trucks may need to be mixed with other ferry traffic to maximize holding space during peak periods. All Build alternatives would permit registered HOV users to bypass some or all of the ferry shoulder queuing to access the toll booths. Elliot Point 1 Alternative would merge HOV users into the general vehicle queue before they reach the toll booths.

Overhead Passenger Loading

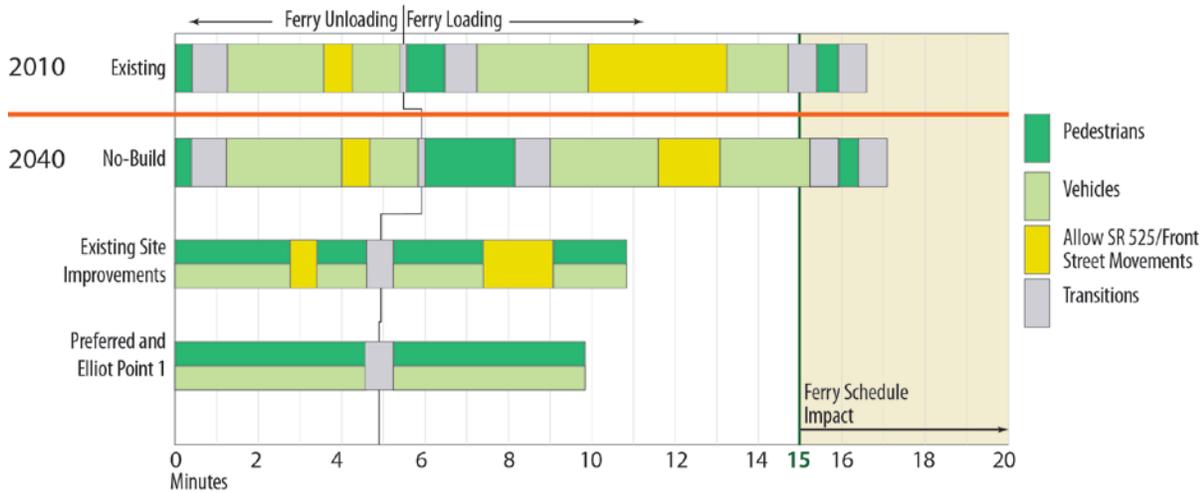
All Build alternatives include overhead passenger loading, which allows pedestrian and vehicle loading to occur simultaneously by separating vehicles and pedestrians. The No-Build Alternative does not include overhead passenger loading. Overhead passenger loading reduces unloading and loading times, which improves ferry schedule reliability. Overhead passenger loading would be provided by a structure connecting the upper ferry deck to an on-land passenger area and would maintain safe ADA grades during low and high tides, unlike the existing condition. Overhead passenger loading would also improve pedestrian safety by reducing conflicts with pedestrians and vehicles on the transfer span and where the transfer span meets the nearest roadway.

Ferry Loading and Unloading Times

The location of the ferry terminal in relation to the local street system and the presence of overhead passenger loading affect ferry turnaround time. To maintain the 30-minute headways between Mukilteo and Clinton, the ferries have about 15 minutes to unload and load passengers at either terminal. When the turnaround time exceeds this threshold, ferry vessels fall behind schedule, causing (1) reduced connection reliability, and (2) reduced cross-Sound capacity.

As illustrated in Figure 3-5, field observations found existing ferry terminal unloading and loading times can exceed the 15-minute threshold in the PM peak period. These observations occurred in winter 2010 and the results were used to predict future unloading and unloading times for other alternatives.

Figure 3-5. Mukilteo Ferry Terminal Unloading and Loading Times (Observed Winter 2010, PM Peak Period)



Under the No-Build scenario, increased ferry ridership and the absence of overhead loading means that it would take longer to load and unload passengers. In 2040, it is estimated that the No-Build terminal configuration would take PM peak period ferries, on average, approximately 17 minutes to unload and load passengers before leaving for Clinton (see Figure 3-5). This would affect the overall ferry schedule during the PM peak period.

The Preferred Alternative and Elliot Point 1 Alternative eliminate the time required to stop ferry traffic at the SR 525-Front Street intersection to allow local traffic to clear. Providing a continuous off-loading process helps meet the objectives of reliability and efficiency. The average load and unload time is almost 7 minutes faster than the No-Build Alternative and would enable the ferries to maintain their schedules.

As illustrated in Figure 3-5, the addition of overhead passenger loading for the Existing Site Improvements Alternative would reduce the time to load and unload each ferry to approximately 11 minutes, almost 6 minutes faster than the No-Build Alternative, and would enable the ferries to better maintain their schedules. However, some conflicts with street traffic and pedestrian crossings would remain, which would affect reliability.

Ferry Shoulder Queuing

The ferry shoulder queues that typically occur during the weekday PM peak period are projected to increase for the 2040 No-Build, Preferred, and Existing Site Improvements alternatives, compared to 2010 conditions. Elliot Point 1 is the only alternative where vehicle queues from the toll booth would not extend to SR 525 during the PM peak period on a daily basis. Under all alternatives, higher weekend

and seasonal travel would continue to create longer queues. The analysis assumed that three toll booths were operating and the fourth was held in reserve, which is typical for daily operations.

The differences in queue lengths during the weekday evening peak period among the alternatives result primarily from the ability of some of the alternatives to store vehicles before the queue extends back to the SR 525-5th Street intersection, as shown in Figure 3-6. After the queue extends back onto SR 525, the queue lengthens even more because vehicles must keep clear of driveways and intersections. For example, the Preferred Alternative queue on SR 525 is shorter than the No-Build and Existing Site Improvement alternatives because the typical peak period queue can be held within the extended First Street. The No-Build and Existing Site Improvements alternatives are generally similar, but the queue for the Existing Site Improvements Alternative is slightly longer because of a traffic signal added at the SR 525-First Street intersection just south of the toll booths.

Navigable Waterways

The effects on navigation for ferries crossing the shipping lane would be similar to existing conditions and would not vary significantly among alternatives. Other effects on navigable waterways would also be similar to existing conditions.

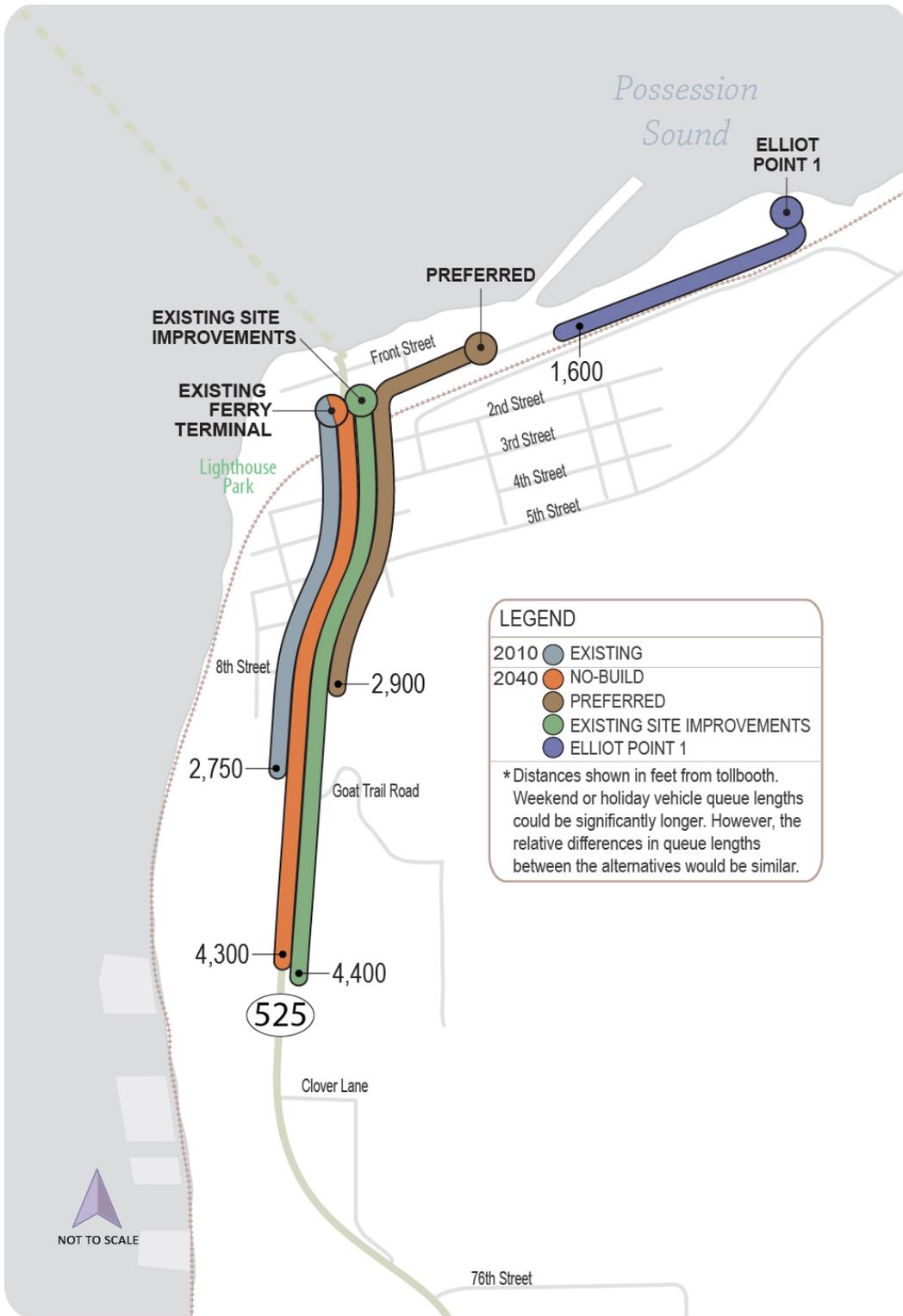
Mukilteo Terminal Facility Safety and Security

Overhead passenger loading, which separates vehicles and pedestrians during ferry passenger loading and unloading, reduces the risk of collisions. For the Preferred and Elliot Point 1 alternatives, passengers could travel between the ferry and the transit center without crossing a roadway, which would eliminate any conflict with vehicle traffic.

For the Build alternatives, the proposed transit center would provide space for six separate bus bays and would eliminate buses blocking roadways such as Front Street. Properly sized bus zones would ensure that bus passengers wait, load, and unload in designated areas.

The Preferred and Elliot Point 1 alternatives would include security fences and gates to allow the holding area to be secured during periods of higher security.

Figure 3-6. Typical Weekday Peak Period Ferry Shoulder Queue Length in Mukilteo



3.3.2 Traffic Operations

Conditions Common to All Alternatives

Roadway improvements occurring prior to 2040 that are common to all alternatives include a northbound right-turn lane at the stop-controlled SR 525-Front Street intersection. This is the primary intersection that would be affected differently among the alternatives. Because projected 2040 roadway volumes are the same for all alternatives, intersection operations are projected to be similar for intersections along SR 525 between 5th Street and Harbour Pointe Boulevard, and the Mukilteo Boulevard-Glenwood Avenue intersection. The LOS for the study area intersections south and east of 5th Street is summarized in Table 3-8. Also, the No-Build and Build alternatives would maintain a similar break in off-loading traffic to allow side street traffic to turn onto SR 525.

Table 3-8. 2040 Level of Service Summary (PM Peak Hour)

Intersection	Control Type	2010 LOS	2010 Existing Delay (sec/veh)	2040 LOS	2040 No-Build and Build Alternatives Delay (sec/veh)
SR 525/Harbour Pointe Boulevard	Signal	C	21	D	51
SR 525/88th Street SW	Stop Sign	E	43	F	> 200
SR 525/84th Street SW/SR 526	Signal	C	28	D	52
SR 525/76th Street SW	Stop Sign	C	20	D	29
SR 525/5th Street	Signal	D	51	E	55
West Mukilteo Boulevard/ Glenwood Avenue	Signal	B	14	C	24

As shown in Table 3-8, vehicle delay at intersections increases from 2010 to 2040, which is caused more by increases in background traffic volumes than by the small increase in ferry vehicle traffic. In 2040, the SR 525-88th Street SW and SR 525-5th Street intersections have a projected failing LOS service because they exceed the standard set by the City of Mukilteo of LOS D or better. Traffic turning from 88th Street SW or crossing SR 525 would experience a long delay because of insufficient gaps in traffic along SR 525.

No-Build Alternative

Roadway improvements occurring prior to 2040 include the relocation of the existing signal on the Mukilteo ferry terminal transfer span south towards the SR 525-Front Street intersection.

The No-Build Alternative LOS for the SR 525-Front Street intersection is summarized in Table 3-9 and is projected to remain at LOS E. The vehicle delay would increase slightly during the PM peak hour, which includes the time vehicles at the intersection are stopped during the ferry unloading and loading process.

Table 3-9. No-Build Alternative Level of Service Summary (PM Peak Hour)

Intersection	Control Type	Existing 2010		No-Build 2040	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
SR 525/Front Street	Stop Sign	E	48	E	52

Vehicle delay at the Park Avenue-Front Street and Park Avenue-First Street intersections would increase slightly due to increased pedestrian traffic between the Mukilteo ferry terminal and Mukilteo Station.

Preferred Alternative

People driving to the Mukilteo ferry terminal would turn at a new SR 525-First Street intersection and travel east to the toll booth entrance-First Street intersection. Vehicles would queue along the curb lane of SR 525, as they do today and along First Street. Authorized HOV users would drive in the inside lane, bypassing the shoulder queuing, and enter into mixed traffic immediately before the toll booths.

The LOS for intersections in the immediate vicinity of this alternative is summarized in Table 3-10. Delays at the SR 525-Front Street intersection would decrease almost 38 seconds compared to the No-Build Alternative because the ferry terminal would be relocated and the loading and unloading operations would no longer affect this intersection directly. The modified intersections resulting from the First Street extension would operate at an acceptable LOS.

Table 3-10. Preferred Alternative Level of Service Summary (2040 PM Peak Hour)

Intersection	Control Type	No-Build Alternative		Preferred Alternative	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
SR 525/Front Street	Stop Sign	E	52	B	14
SR 525/First Street	Signal	n/a	n/a	A	7
Park Avenue/First Street	Stop Sign	n/a	n/a	A	10
Toll booth/First Street	Signal	n/a	n/a	B	11

Existing Site Improvements

Vehicle drivers going to the Mukilteo ferry terminal would enter the holding area after passing through a new signal at the SR 525-First Street intersection. Authorized HOV users, such as vanpools, would bypass the shoulder queuing lane and proceed to the short queue at the toll booths.

The LOS for intersections in the immediate vicinity of this alternative is summarized in Table 3-11. Overhead passenger loading would slightly reduce the duration of intersection blockage during ferry loading and unloading compared to the No-Build Alternative because pedestrian trips from the terminal to the bus stop would no

longer cross this intersection. The modified intersections resulting from the First Street extension would operate at an acceptable LOS.

Table 3-11. Existing Site Improvements Alternative Level of Service Summary (2040 PM Peak Hour)

Intersection	Control Type	No-Build Alternative		Existing Site Improvements Alternative	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
SR 525/Front Street	Stop Sign	E	52	E	48
SR 525/First Street	Signal	n/a	n/a	B	17
Park Avenue/First Street	Stop Sign	n/a	n/a	A	10

Elliot Point 1 Alternative

The route for drivers to the ferry terminal for the Elliot Point 1 Alternative would be very similar to the Preferred Alternative from SR 525 to the Mukilteo Tank Farm.

The LOS for intersections in the immediate vicinity of this alternative is summarized in Table 3-12. The delay at the SR 525-Front Street intersection would decrease by almost 38 seconds compared to the No-Build Alternative. This is because the ferry terminal would be relocated and the loading and unloading operations would no longer affect this intersection directly. The modified intersections resulting from the First Street extension would operate at an acceptable LOS.

Table 3-12. Elliot Point 1 Alternative Level of Service Summary (2040 PM Peak Hour)

Intersection	Control Type	No-Build Alternative		Elliot Point 1 Alternative	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
SR 525/Front Street	Stop Sign	E	52	B	14
SR 525/First Street	Signal	n/a	n/a	A	6
Park Avenue/First Street	Stop Sign	n/a	n/a	A	10
West driveway/First Street	Stop Sign	n/a	n/a	A	9
East driveway/First Street	Signal	n/a	n/a	A	1

3.3.3 Non-Motorized Transportation

Each Build alternative changes travel flows and travel distances for non-motorized users connecting to and from the Mukilteo ferry terminal, compared to the No-Build Alternative. Forecasted distributions for pedestrians and bicyclists are presented in the *Transportation Discipline Report*.

Pedestrian Connections

Tables 3-13 through 3-15 and Figure 3-7 show the distance and estimated average time for pedestrians to walk to and from the terminal and common destinations in

the project vicinity. The average walk time to the Mukilteo ferry terminal does not include the time to purchase a ticket or the time to travel from the passenger building to the ferry. The average walk time from the Mukilteo ferry terminal includes the time to exit the ferry via the overhead loading ramps to calculate the connection time (walk times) to other modes.

Figure 3-7. Pedestrian Pathways to the Mukilteo Ferry Terminal



Table 3-13. Estimated Walk Distances

Alternative	Mukilteo Station to Passenger Building (feet)	Ferry to Mukilteo Station (feet)	Bus Stop /Transit Center to Passenger Building (feet)	Ferry to Bus Stop/ Transit Center (feet)	Second Street to Passenger Building (feet)	Ferry to Second Street (feet)	Between Bus Stop/Transit Center and Mukilteo Station (feet)
Existing/ No-Build	1,730	1,960	190	430	880	1,120	1,850
Preferred	745	1,040	225	545	2,325	2,660	970
Existing Site Improvements	1,650	2,040	590	990	840	1,240	1,190
Elliot Point 1	1,610	1,970	540	900	3,550	3,920	1,080

Table 3-14. Walk Travel Times to the Mukilteo Ferry Terminal (2040 PM Peak Period)

Alternative	Mukilteo Station to Passenger Building (minutes)	Bus Stop/Transit Center to Passenger Building (minutes)	Second Street to Passenger Building (minutes)	Between Bus Stop/Transit Center and Mukilteo Station (minutes)
Existing	8.6	1.0	3.5	9.3
No-Build	8.9	1.0	3.6	9.7
Preferred	3.8	0.9	11.1	4.9
Existing Site Improvements	8.5	3.0	4.6	6.1
Elliot Point 1	8.3	2.5	15.8	5.6

Table 3-15. Walk Travel Times from the Mukilteo Ferry Terminal (2040 PM Peak Period)

Alternative	Ferry to Mukilteo Station (minutes)	Ferry to Bus Stop and Transit Center (minutes)	Ferry to Second Street (minutes)
Existing	10.4	2.0	6.3
No-Build	10.6	2.1	6.6
Preferred	5.2	2.3	12.8
Existing Site Improvements	10.0	4.7	6.4
Elliot Point 1	10.3	4.8	17.8

No-Build Alternative

Pedestrian walk times under the No-Build Alternative would be similar to existing conditions. While walk times to the ferry would be similar to existing conditions, walk times from the ferry could increase due to higher pedestrian volumes leaving the ferry.

Preferred Alternative

The average walk time from Mukilteo Station to the passenger building would be approximately 4 minutes (see Table 3-14) and the return trip would be approximately 5 minutes (see Table 3-15); both are more than 4 minutes shorter compared to the No-Build Alternative.

Pedestrians walking from the proposed transit center, located east of the ferry terminal, to the passenger terminal would travel along a walkway on Possession Sound's shoreline. Bus passengers would be provided with an overpass to cross the transfer span for access to the passenger terminal. Because the transit center would provide a long curb zone for buses to drop off passengers, the distance and associated walk time to the passenger building would depend on bus position. The average walk time from the transit center to the passenger building or from the ferry to the transit center would be slightly longer than the No-Build Alternative.

Pedestrians walking from upper Mukilteo would either cross the railroad using the SR 525 bridge to the First Avenue extension or use the Mount Baker crossing. The primary walk route would be along the First Avenue extension, which includes sidewalk, bicycle, and safety improvements. This alternative would increase the walk time between the Second Street parking lot and the Mukilteo ferry terminal by more than 6 minutes because the walk distance would increase by approximately 1,400 feet.

Existing Site Improvements Alternative

As shown in Table 3-14, walk times for pedestrians traveling to the passenger building from Mukilteo Station would decrease. Because the passenger building would be relocated to the east side of the SR 525-Front Street intersection, pedestrians walking from Mukilteo Station would no longer have to wait for the ferry vehicle loading and unloading process. The walk time between the transit center and the passenger building would increase because the distance between the destinations would increase by approximately 400 feet.

Elliot Point 1 Alternative

The average walk time between Mukilteo Station and the Mukilteo ferry terminal would increase because of the longer distance, but pedestrians would have improved facilities and fewer potential conflicts with vehicles.

Pedestrians walking from the proposed transit center, located west of the ferry terminal, to the passenger terminal would travel along a walkway on Possession Sound's shoreline. Bus passengers would not have to cross vehicle traffic to access the passenger terminal because it would be located on the western edge of the ferry dock. Because the transit center would provide a long curb zone for buses, the distance and associated walk time to the passenger building would depend on bus position.

Pedestrians walking from locations south of Second Street would likely use Mukilteo Lane and cross the railroad tracks at the existing Mount Baker crossing. The average walk time from these parking lots to the passenger building would be approximately 16 minutes, and from the ferry to the Second Street park-and-ride lot would be approximately 18 minutes. The increase in walk time for both directions would be about 11 minutes because the distance between these connections would increase by more than 2,600 feet.

Bicycle Facility Conditions

The addition of bicycle lanes to the roadway network varies by Build alternative. Under all alternatives, bicycles crossing the SR 525 bridge would share the lane with vehicle traffic, similar to existing conditions. Bicyclists would continue to use the vehicle toll booths to pay their ferry fare.

No-Build Alternative

The manner in which bicycles arrive at the Mukilteo ferry terminal, are processed through the toll booths, are directed to the managed holding area lanes, and are loaded onto the ferry for the No-Build Alternative would remain the same as existing conditions.

Preferred Alternative

This alternative would provide an eastbound bicycle lane on First Street between SR 525 and the west transit center driveway. A westbound bicycle lane would be provided along the terminal area exit lanes to First Street and continue west to SR 525.

Existing Site Improvements Alternative

Bicycle facility conditions for this alternative are similar to the No-Build Alternative.

Elliot Point 1 Alternative

This alternative would provide bicycle lanes in both directions along First Street between SR 525 and the Mount Baker crossing.

3.3.4 Public Transportation

Through 2040 and for all alternatives under consideration, Community Transit, Everett Transit, Island Transit, and Sound Transit are anticipated to continue providing bus and rail transit service connecting to the Mukilteo-Clinton ferry route.

No-Build Alternative

Access to the Mukilteo ferry terminal and the performance of transit facilities would remain essentially unchanged as shown by the transit travel times in Table 3-16.

Table 3-16. Transit Travel Times Serving Mukilteo Ferry Terminal (2040 PM Peak Period)

Alternative	From First Street to Bus Stop/Transit Center (minutes)	From Bus Stop/Transit Center to First Street (minutes)
Existing	0.6	0.2
No-Build	0.6	0.2
Preferred	1.7	1.8
Existing Site Improvements	0.6	0.9
Elliot Point 1	1.4	1.8

Note: These travel times do not include additional time to serve a potential bus stop closer to the First Street-Park Avenue intersection.

Preferred Alternative

A new transit center on the waterfront east of the new terminal would have six bus bays and would serve scheduled routes and paratransit service. Its passenger amenities would include a waterfront promenade, benches, shelters, passenger information, and lighting. The facility would meet Everett Transit and Community Transit bus zone and layover space requirements.

This alternative would relocate the current bus stops at the SR 525-Front Street intersection to the new transit center. This relocation would increase the walking distance to Mukilteo Lighthouse Park and businesses along Front Street. Additional bus zones on First Street near Park Avenue are discussed in *Section 3.7.3*.

Transit signal priority would be provided at intersections along First Street. However, transit signal priority would not interrupt ferry vehicle unloading and may be of limited use where nearside bus stops are located. Because the transit center is farther than the existing stop location and buses pass through two new signals, the route time would increase by 1.1 minutes to the transit center and by 1.6 minutes away from the transit center compared to the No-Build Alternative.

The transit center would be approximately 770 feet closer to Mukilteo Station than the existing SR 525 bus stops near Front Street. Sounder passenger pick-up/drop-off would likely occur in the revised Mukilteo Station parking lot or along First Street.

Existing Site Improvements Alternative

A new transit center east of the holding lanes would include a ferry employee parking lot in between the bus stops. The transit center would serve scheduled bus routes.

Paratransit service would use parking spaces on Front Street. The facility could include passenger amenities such as benches, shelters, passenger information, and lighting. Space for six buses would also be provided at the transit center. Because the site is constrained, only some of the buses would be able to depart before the bus in front departs.

Because the transit center would be slightly farther than the existing stop location and buses would pass through a new signal, the outbound route time would increase by 0.7 minute compared to the No-Build Alternative.

The transit center would be closer to Mukilteo Station than the existing SR 525 bus stops near Front Street (see Table 3-16). The facility would meet Everett Transit and Community Transit bus zone and layover space requirements. This alternative would have no impact on the Mukilteo Station parking area or passenger pick-up/drop-off area.

Elliot Point 1 Alternative

A new transit center on the waterfront west of the new terminal would have six bus bays and passenger amenities, including a waterfront promenade, benches, shelters, passenger information, and lighting. This transit center would serve scheduled routes and provide paratransit service. The facility would meet Everett Transit and Community Transit bus zone requirements, but separate layover space is not included on the site.

This alternative would relocate the current bus stops at the SR 525-Front Street intersection to the new transit center. This relocation would increase the walking distance to Mukilteo Lighthouse Park and businesses along Front Street. The potential for providing additional bus zones on First Street near Park Avenue is discussed in *Section 3.7.3*.

Transit signal priority would be provided at intersections along First Street; however, transit signal priority would not add time to the ferry vehicle unloading process. Because the transit center is farther than the existing stop location and buses would pass through three new signals, the route time would increase by 0.8 minute to the transit center and by 1.6 minutes away from the transit center compared to the No-Build Alternative.

The transit center would be located approximately 290 feet closer to Mukilteo Station than the existing SR 525 bus stops near Front Street. This alternative would not affect the Mukilteo Station parking lot because the roadway would be modified and the existing pick-up/drop-off area would be eliminated.

3.3.5 Parking

No increase in paid parking space is projected for the No-Build and Build alternatives, and on-street parking restrictions in Mukilteo were assumed to remain unchanged. Changes in parking by alternative are shown in Table 3-17. The projected increase in ferry-related park-and-ride demand from 2010 to 2040 was 43 percent or an additional 62 vehicles. Based on the December 2010 survey of how many spaces are typically occupied, adequate capacity would exist to accommodate this increase in demand.

Table 3-17. Parking Space Change by Alternative

PARKING LOT	Parking Location	No-Build	Preferred	Existing Site Improvements	Elliot Point 1	Notes
		Number of Spaces				
A	Southwest corner of SR 525 and Front Street	98	109	109	109	Off-Street private lot / paid (total does not include 5 vendor and 6 unmarked stalls)
B	Second Street between SR 525 and Park Avenue	40	40	40	40	Off-Street private lot / paid
C	Former Buzz Inn property (southwest corner of Front Street and Park Avenue)	n/a	n/a	n/a	n/a	This 45-space lot for Ivar's Mukilteo Landing is not included in totals because its use would be displaced
D	Port of Everett Mount Baker Terminal	30	30	30	33	Combined Port of Everett and public lot
E	Mukilteo Station Parking	63	63	63	59	Sound Transit park-and-ride lot
K	New Lot at Terminal	--	--	--	43	Off-Street public lot
	Subtotal	231	242	242	284	
	Net change compared to No-Build		11	11	53	
ON-STREET/GENERAL PUBLIC PARKING						
F	First Street between SR 525 and Park Avenue	25	43	0	0	On-street / time restrictions / parking passes
G	Park Avenue between Front Street and First Street	18	17	13	12	On-street / time restrictions / parking passes
H	Front Street between SR 525 and Park Avenue	26	26	26	26	On-street / time restrictions / parking passes
	Subtotal	69	86	39	38	
	Net change compared to No-Build		17	-30	-31	
Total Parking Lot and On-Street Parking Spaces		300	328	281	322	
Net change compared to No-Build			28	-19	22	
WSF PARKING						
I	WSF employee parking	20	40	40	40	WSF employees only
J	WSF employee parking (at Mukilteo ferry terminal)	23	0	13	0	WSF employees only
	Subtotal	43	40	53	40	
	Net change compared to No-Build		-3	10	-3	

No-Build Alternative

This alternative would not change parking capacity near the Mukilteo ferry terminal (see Figure 3-8 and Table 3-17). The No-Build Alternative would provide slightly more than the minimum of 40 spaces needed for ferry employee parking.

Figure 3-8. No-Build Parking Area Map



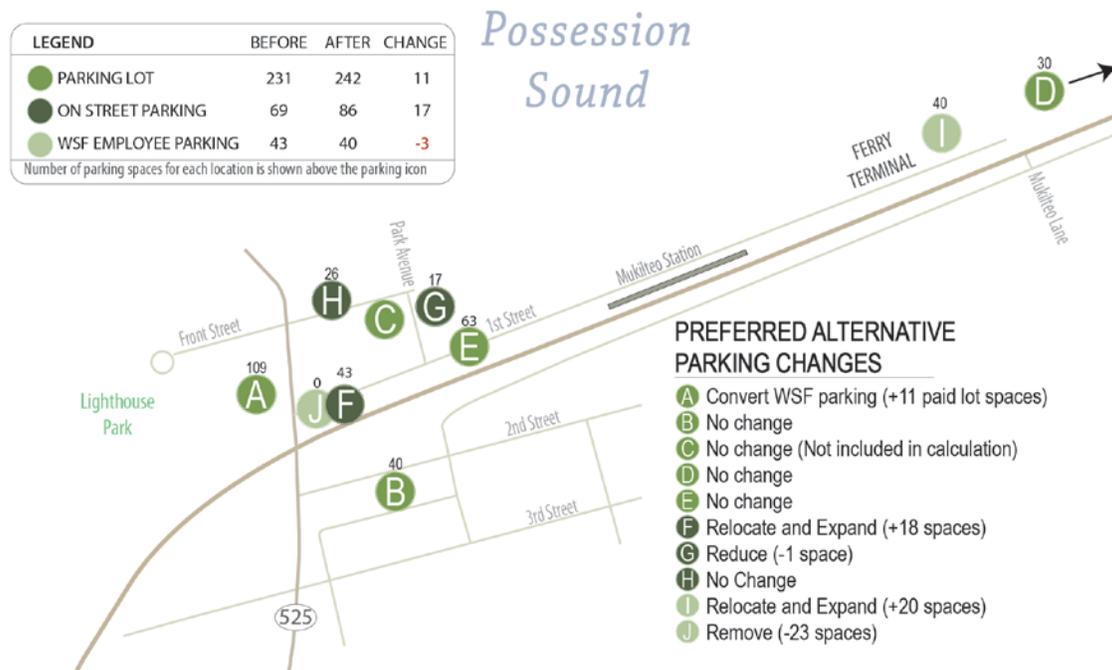
Preferred Alternative

This alternative would increase the amount of public on-street parking and parking lot capacity by 28 spaces (see Table 3-17).

On-Street Parking

This alternative would remove approximately 26 on-street parking spaces (see Figure 3-9) due to the widening and realignment of First Street. This would reduce the number of on-street parking spaces along Park Avenue and eliminate parking on First Street between SR 525 and Park Avenue. This action could place additional parking demand on parking spaces west of Park Avenue, but replacement parking would be provided in a new parking lot south of the First Street-Park Avenue intersection.

Figure 3-9. Preferred Alternative Parking Area Map



Parking Lots

The number of parking spaces provided in parking lots would increase by up to 54 spaces. A new parking lot would be provided to the west of the Mukilteo Station parking lot. In addition, the parking spaces at the Mukilteo ferry terminal would be signed and managed for ferry employee parking only.

The Preferred Alternative would increase the walk time from parking areas to the Mukilteo ferry terminal, such as the Second Street parking lot, by approximately 6 minutes compared to the No-Build Alternative. However, ferry riders affected by this travel time increase represent a small portion of total ferry ridership. Potential business ramifications are discussed in *Section 4.2 Land Use and Economics*.

Ferry Employee Parking

Ferry employee parking would be co-located with the transit center east of the Mukilteo ferry terminal, and approximately 40 spaces would be provided. The existing holding area and the existing ferry employee parking area would be vacated. There are 11 parking spaces adjacent to Mukilteo Lighthouse Park that ferry employees currently use, and those could be converted to regular lot spaces, which would expand that lot’s capacity from 98 spaces to 109 spaces.

Existing Site Improvements Alternative

This alternative would reduce the amount of on-street and parking lot parking capacity by approximately 19 spaces.

On-Street Parking

This alternative would reduce the amount of on-street parking spaces near the Mukilteo ferry terminal by approximately 30 spaces (see Table 3-17).

Parking Lots

The parking capacity in lots would be increased by approximately 11 spaces. The removal of Ivar's restaurant would reduce parking demand in the area.

Ferry Employee Parking

The parking area for ferry terminal employees could accommodate approximately 53 spaces. This amount exceeds the design criteria for 40 spaces but provides the flexibility to add capacity if needed, such as if a second slip is ultimately developed. Currently, ferry employees use 20 parking spaces in the existing parking lot (Lot A), which would no longer be needed. Eleven of the 20 parking spaces adjacent to Mukilteo Lighthouse Park would be converted to regular lot spaces, which would expand the parking lot (Lot A) from 98 spaces to 109 spaces. The other 9 spaces would likely revert to BNSF Railway use.

Elliot Point 1 Alternative

This alternative would increase the amount of on-street and parking lot parking capacity by approximately 22 spaces (see Table 3-17).

On-Street Parking

The Elliot Point 1 Alternative would result in a net loss of approximately 31 on-street parking spaces. The widening and realignment of First Street would reduce the number of on-street parking spaces along Park Avenue and eliminate parking in the area between SR 525 and Park Avenue. The loss of on-street parking could place additional parking demand on parking spaces west of Park Avenue.

Although some of the on-street parking would be replaced with the new parking lot at the Mukilteo ferry terminal, those spaces would be over 2,000 feet east of the Park Avenue-First Street intersection. This could increase the walk time to destinations by approximately 8 to 9 minutes. Because this parking lot would be used to access local businesses and the shoreline, there would be little impact on ferry passengers.

Parking Lots

The number of parking spaces provided in parking lots would increase by approximately 53 spaces. To improve safety, the Mukilteo Station parking lot would be redesigned to switch the orientation of the parking stalls and improve the vehicle approach angle to the driveway exit onto First Street. This would result in a loss of approximately four parking spaces. A new public parking lot at the Mukilteo ferry terminal would be constructed west of the holding area and Japanese Creek. ADA-compliant parking spaces would be provided at the adjacent transit center. The terminal parking would replace some of the lost on-street and Mukilteo Station parking. The Mount Baker Terminal parking area would be improved and provide

approximately 33 spaces for Port of Everett employees and the public. This area would provide parking spaces for the public to use when accessing the shoreline.

The Elliot Point 1 Alternative would increase the walk time from parking areas in Mukilteo, such as the Second Street parking lot, by approximately 11 to 12 minutes compared to the No-Build Alternative. However, ferry riders affected by this travel time increase represent a small portion of total ferry ridership. Potential business ramifications are discussed in *Section 4.2 Land Use and Economics*.

Ferry Employee Parking

Currently, ferry employees use 20 parking spaces in the existing parking lot (Lot A), which would no longer be needed. Ferry employee parking would be provided in a new parking lot at the Mukilteo ferry terminal, which would have 40 spaces. The existing 11 parking spaces adjacent to Mukilteo Lighthouse Park would be converted to regular lot spaces, which would expand the existing parking lot. The other 9 spaces would likely revert to BNSF Railway use.

3.3.6 Freight

Rail Operations

Rail operations would not be affected by any of the Build alternatives. The rail spur crossing Mukilteo Lane, which connects the Port of Everett and Paine Field, would experience an increased number of pedestrian crossings. However, it is used irregularly, and the indirect increase in foot traffic due to the opened shoreline access area would not affect rail operations.

Truck Freight

At the Mukilteo ferry terminal, truck freight traffic would continue to be directed to the designated holding area freight lanes for the No-Build and Existing Site Improvements alternatives. These lanes permit trucks to load independently of other ferry vehicle traffic. For the Preferred and Elliot Point 1 alternatives, truck freight could be required to mix with other ferry traffic in the holding area during peak periods because there would be fewer lanes to manage traffic.

3.4 Construction Impacts

This section describes the anticipated impacts from construction of the No-Build and Build alternatives. All project alternatives would involve both physical and operational changes to existing ferry terminal facilities and other facilities in the project area. Also, construction activities would sometimes increase congestion on SR 525 during peak travel periods.

3.4.1 General Considerations for all Alternatives

Limited Access to the Mukilteo Ferry Terminal

An unavoidable challenge with construction activities for the Mukilteo ferry terminal is the limited access to the site; it can only be accessed from SR 525. Construction

access through the Mount Baker Terminal crossing is impossible because the roadway has load limit restrictions, is subject to landslides, is designated as a quiet zone, and would require trucks to use residential streets.

Construction Timing and Activities

The project would comply with WSDOT Ferries Division policy, which generally limits construction activities to the off-peak season. Although construction activities would have less impact during the off-peak season between September and May, the off-peak season still has substantial demands during evening commute periods. Ferry shoulder queuing on SR 525 could extend past Goat Trail Road and passengers could be waiting for over an hour to board the ferry during construction activities.

Duration of Construction

The No-Build Alternative would still involve construction activities for replacement of the Mukilteo ferry terminal's aging infrastructure. The No-Build Alternative construction would consist of smaller projects lasting approximately 3 to 6 months over the next 20 years. All of the Build alternatives would remove the existing terminal and construct an improved terminal and supporting facilities with either a different layout (Existing Site Improvements Alternative) or at a new site (Preferred and Elliot Point 1 alternatives). The Existing Site Improvements Alternative would have construction activities lasting 1 to 2 years; the Preferred and Elliot Point 1 alternatives have more construction activities and would last about 3 to 4 years, although major activities would last only about 2 years.

The estimated length of construction could be either longer or shorter depending on design, permit conditions, phasing, and the contractor's construction approach. Construction timing and duration would also depend on the availability of funding and other approvals. Site development and site preparation activities, such as property acquisition, demolition, and some utility relocation activities, could occur any time after the environmental process is complete. Major activities for any of the Build alternatives could begin by 2015, and the terminal could begin operation in 2018 or 2019.

Duration of Mukilteo Ferry Terminal Closure

The duration of the Mukilteo ferry terminal closure, which would divert ferry trips from Mukilteo to Edmonds during construction activities, varies by alternative. WSDOT could stage the No-Build Alternative to consolidate closures. While the smaller individual projects would last for 3 to 6 months, consolidating construction under the No-Build Alternative could close the terminal for 3 to 9 months. Construction activities for the Existing Site Improvements Alternative are anticipated to close the terminal for 1 to 2 months. The Preferred and Elliot Point 1 alternatives construction could occur without closure or with a short overnight or weekend closure.

3.4.2 No-Build Alternative

For this alternative, the construction activities associated with maintenance and structure replacements that would close the terminal are anticipated to last 3 to 9 months.

During initial construction, activities requiring temporary facility closure could be scheduled for weekends and nights to minimize disruptions to ferry users. During the ferry terminal closure, ferry service would be diverted to Edmonds. Passenger-only service could be maintained between Clinton and Mukilteo. Commuters would see an increase in their travel times and, potentially, need to change how they travel during this period.

Because the sailing time between Clinton and Edmonds is approximately 50 minutes compared to the 15-minute sailing time between Clinton and Mukilteo, travel time across Possession Sound would increase by approximately 35 minutes. This increased sailing time also means that fewer ferry trips per day would occur with the current number of ferries serving the routes. Currently, there are 37 ferry trips a day between Mukilteo and Clinton; the number of daily trips would be reduced to approximately 18 trips when sailing between Edmonds and Clinton. With fewer ferry trips, it is likely that more ferries would sail full, increasing the potential wait times for passengers who would need to wait for the next sailing.

In response, people would likely change their travel patterns in the following ways:

- **Driving:** Vehicles would be redirected to Edmonds, which would reduce the amount of traffic on SR 525 in Mukilteo and increase traffic on SR 524 and SR 104 in Edmonds. Cross streets connecting to SR 524 and SR 104 would experience negligible, if any, changes in traffic volumes. However, those streets would nevertheless experience delay because of the increased vehicular traffic on SR 524 and SR 104. Some of the people who previously chose to take their vehicles on the ferry may decide to drive around the north end of Whidbey Island on SR 20 or shift to a walk-on passenger mode because of the increase in ferry wait times.
- **Rail Passengers:** When the Mukilteo-Clinton route is diverted to Edmonds, passengers who continue their trip on the Sounder commuter rail would be able to connect at the Edmonds Station. The Sounder commuter rail would still provide service to Mukilteo.
- **Bus Passengers:** People making a connection between bus transit and the Mukilteo ferry terminal would need to alter their bus route to use existing Community Transit routes. This would require a transfer to complete the connection. People could also use Sounder train service to connect from Mukilteo to Edmonds during the AM peak and from Edmonds to Mukilteo during the PM peak. A direct bus shuttle service could also be provided between the two ferry terminals.
- **Park-and-Ride:** People who travel from Mukilteo to Clinton and leave their vehicles in parking lots in Mukilteo may not be affected if passenger-only service is maintained between Mukilteo and Clinton. The lack of passenger-

only ferry service could cause some people to seek park-and-ride space near the Edmonds ferry terminal.

- ***Bicycles:*** The distance between the Mukilteo and Edmonds ferry terminals is approximately 14 miles. Some bicyclists may choose alternative modes of travel.
- ***Walk-on Passengers:*** The majority of walk-on passengers would experience the effects described for rail, bus, and park-and-ride passengers. The remaining portion of walk-on passengers would need to use another mode of transportation because the distance between the Mukilteo and Edmonds ferry terminals is too far to walk.
- ***Trip Avoidance or Disruption:*** Some people may elect not to take some ferry trips during this time. These trips would tend to be elective and recreational trips and not work commute trips; however, work trips could also decrease. Closure during the peak summer season would have more impact on ferry users traveling in vehicles than the fall to spring season.

During the full closure periods, construction truck trips along SR 525 to the Mukilteo ferry terminal would peak for fill, asphalt, and concrete deliveries. These trips would likely be subject to travel restrictions during peak ferry times. This increase in truck traffic is not anticipated to greatly affect roadway operations because of the decrease in ferry vehicle traffic during the terminal closure.

Some of the on-street parking along Front Street closest to SR 525 would be temporarily removed during construction activities.

3.4.3 Preferred Alternative

The existing terminal would remain fully functional until the new multimodal facility is ready. The shift to the new terminal could occur overnight or with a short closure at night or on a weekend. Demolition of the existing facility would cause a short-term increase in truck traffic on SR 525. Construction-related truck traffic on SR 525 would primarily be for material deliveries and removal of demolition debris.

Depending on work phases, construction of the First Street extension could affect access to the Mukilteo Station parking lot and detours or route revisions would be needed, but access throughout the waterfront area would be maintained.

3.4.4 Existing Site Improvements Alternative

Although various portions of the existing site would need to be reconfigured and the area roadways would be modified, the Mukilteo ferry terminal would continue to operate during construction of most terminal replacement elements. Construction activities would still require schedule changes, including limited evening or weekend sailings, or weekend closures, but most of the site and facilities could be developed without affecting ferry operations. Full closure would be required for 1 to 2 months to replace the transfer span and other terminal elements. During this time, ferry service would be re-routed to Edmonds with effects similar to those described for the No-Build Alternative.

Some short-duration lane closures could occur; traffic operations would be maintained by a one-way flagger control. Because SR 525 provides the only access over the BNSF tracks, there are no detour options. Construction-related truck traffic on SR 525 would primarily be for material deliveries and removal of demolition debris.

Construction activities for the First Street extension would require temporary short-term closures of one or two lanes on SR 525, which would likely occur during non-peak ferry periods. This activity could be phased towards the end of the project to minimize disruption to the regular ferry operations. The First Street extension construction would last 3 to 4 months.

The transit center could be constructed early. Buses could then temporarily use Front Street and Park Avenue to access the relocated bus zones. Some parking along Front Street would be temporarily removed to accommodate the larger turning radius required for buses.

3.4.5 Elliot Point 1 Alternative

The construction impacts to transportation for the Elliot Point 1 Alternative would be similar to those described for the Preferred Alternative.

3.5 Indirect and Secondary Impacts

Indirect effects result from one project but, unlike direct effects, typically involve a chain of cause-and-effect relationships that can take time to develop and can occur at a distance from the project site. Induced growth or growth-inducing effects are terms used to mean indirect effects related to changes in land use, population density, or growth rate.

The base land use assumptions used to develop the future travel demand forecasts for this project (using the *WSDOT Ferries Division Final Long-Range Plan* model) are consistent with the GMA plans in Island County and Snohomish County. Therefore, the potential for “induced growth” is already incorporated into the forecasts as “planned growth” consistent with GMA plans. Also, because future vehicle volume increases are constrained by vessel capacity and there is a large estimated increase in walk-on passengers compared to vehicles in the future, the potential for any induced vehicle travel would be very small for this project.

3.6 Cumulative Impacts

Most cumulative transportation impacts are already assumed in the future year transportation projections used for the direct impact analysis in *Section 3.4*. This includes expectations for increased growth in local and regional population and employment, as well as the resulting increases in travel. Some of the other future development actions in the area could result in other impacts that could create different cumulative effects.

3.6.1 Sound Transit Mukilteo Station

Sound Transit's Mukilteo Station is being developed in phases. A second phase of the project, which will be under construction from mid-2013 to fall 2014, will add a platform on the south side of the tracks, and provide a pedestrian bridge to connect the two platforms.

Sound Transit and the City of Mukilteo are continuing to study potential options for expanding parking; a specific site and layout designs have not yet been confirmed. More commuter parking for the Mukilteo Station would improve access to commuter rail service, which could increase local vehicle trips during the peak period.

To evaluate cumulative effects associated with parking at Mukilteo Station, the project team considered traffic impacts if parking is expanded by up to 130 stalls. Analysts assumed expanding parking would add 75 vehicle trips traveling to the parking area, and 20 vehicle trips leaving the parking area during the PM peak hour. The SR 525-5th Street intersection is anticipated to have slightly more delay but would operate better than the City's LOS D standard with or without expanding parking.

3.6.2 NOAA Fisheries Service Mukilteo Research Station Expansion

NOAA Fisheries Service operates a laboratory immediately east of the Mukilteo ferry terminal and plans to upgrade the facility to include public outreach and education activities. These plans are not likely to result in a high number of vehicle trips to the facility beyond future levels already assumed in the traffic analysis in *Section 3.4*.

3.6.3 Port of Everett Mount Baker Terminal

The Preferred Alternative would extend First Street to the Mount Baker crossing. This extension would form part of a planned permanent public access road connecting to the Mount Baker Terminal. The Elliot Point 1 Alternative would extend completely to the Mount Baker Terminal. The Existing Site Improvements Alternative would not alter access to the Mukilteo Tank Farm or Mount Baker Terminal. If the Port of Everett improves access to the Mount Baker Terminal independent of the Mukilteo Multimodal Project, traffic conditions would be similar to those already assumed for this proposed project.

3.6.4 Mukilteo Tank Farm Land Transfer and Mount Baker Crossing

The transfer of the Mukilteo Tank Farm to the Port of Everett allows the Port to complete access improvements to the site. *Chapter 2 Alternatives* provides background on this site and its transfer from U.S. Air Force control to the Port of Everett and NOAA.

The Mount Baker crossing is an improved at-grade crossing of the BNSF tracks connecting Mukilteo Lane in the city of Mukilteo to the Mukilteo Tank Farm. This crossing is currently gated, but would be open for access to the public shoreline area near the Mount Baker Terminal when the Port has ownership of the tank farm and can complete the final roadway connection.

The City of Mukilteo intends for the Mount Baker crossing to be open to general-purpose traffic, but this could conflict with Elliot Point 1 Alternative operations. Project concerns would include intersection safety and potential ferry queue jumping. The Preferred Alternative would support the City's plans without ferry operation conflicts because turn movements could be restricted; the Existing Site Improvements Alternative would not affect the crossing.

3.6.5 SR 525 Bridge

The SR 525 bridge over the BNSF railroad has been evaluated by WSDOT bridge engineers. Its current structural capacity and condition do not warrant rehabilitation or replacement at this time even though it does not fully meet ADA standards. The City of Mukilteo has expressed an interest in accelerating the replacement of the SR 525 bridge, but its replacement is not currently funded.

Eventually, construction of a new bridge with current ADA design standards could improve the safety and quality of pedestrian travel in the area. In addition, it would complement the other multimodal investments related to the Mukilteo Multimodal Project. Enhanced pedestrian facilities could increase walk trips by residents traveling from downtown to waterfront destinations, but volumes would likely remain similar to those assumed for the project alternatives. Construction of the bridge would likely require closure of SR 525, temporarily affecting access to the waterfront, Mukilteo ferry terminal, and Mukilteo Station.

3.7 Mitigation Measures

This section discusses measures that could mitigate the adverse effects identified above.

3.7.1 Intersections Projected to Exceed Level of Service Standards

This section describes potential mitigation actions to improve the operations at intersections that would not meet the City of Mukilteo standards. Most of the delay at study area intersections is due to background growth and not the Mukilteo ferry terminal. Therefore, the proportionate share for mitigating the increase in delay is also small.

SR 525-Front Street Intersection

No-Build and Existing Site Improvements Alternatives

The 2040 forecast of LOS E for this intersection is for non-ferry traffic, which would experience most of its delay during the ferry loading and unloading process. When ferry traffic is not being loaded or unloaded, this intersection would operate at or better than the LOS D standard. The proportionate share of ferry vehicle traffic growth through this intersection for all 2040 traffic is 12 percent.

To reduce the delay to non-ferry traffic during ferry loading and unloading, the following mitigation actions could be taken:

- ***Allow northbound SR 525 vehicles to turn left during ferry loading.***
Currently, some vehicles are able to make this turn during the loading process; however, to be conservative in the intersection analysis, it was assumed the northbound left turn was prohibited. Evaluation of vehicle turning radii is needed to ensure there is adequate space for turning movements (two westbound right-turn lanes, one northbound left-turn lane, and an eastbound right-turn lane).
- ***Provide additional breaks in the loading and unloading process.***
Although this would benefit non-ferry traffic, adding time to the ferry turnaround process (loading and unloading) could cause some ferries to miss their scheduled sailings and passengers to miss their connections to the bus or train. When ferries miss scheduled sailings, the shoulder queuing length on SR 525 would increase and the amount of time ferry passengers wait for their ferry would increase.

Preferred Alternative and Elliot Point 1 Alternative

The SR 525-Front Street intersection is projected to operate at LOS B for these alternatives; therefore, no mitigation is needed.

SR 525-88th Street SW Intersection

The SR 525-88th Street SW intersection is a two-way stop-controlled intersection; only traffic on 88th Street SW is required to stop. By 2040, the operating conditions at this intersection are projected to degrade to LOS F for all alternatives because of the projected increase in vehicles passing through this intersection. The vehicle traffic from 88th Street SW represents 3 percent (65 vehicles) of this intersection's volume during the 2040 PM peak hour. The estimated proportion of ferry traffic passing through this intersection is approximately 21 percent, but the growth in traffic from 2010 to 2040 attributed to ferry traffic would be approximately 5 percent.

Preferred Alternative and All Other Alternatives

WSDOT would work with the City of Mukilteo to develop final agreements on the improvements needed to reduce delay; potential measures to reduce delay for 88th Street SW movements include:

- ***Convert lanes to right-turn pockets on 88th Street SW.***
- ***Disallow left turns and through movements from 88th Street SW, diverting traffic to 92nd Street or 84th Street traffic light.*** This would improve operations for eastbound and westbound right-turning vehicles from LOS F to LOS C.

SR 525-5th Street Intersection

The SR 525-5th Street intersection would operate at LOS E during the 2040 PM peak period for all alternatives. Delay for all movements at this intersection would be increased because the northbound ferry and non-ferry traffic movements have separate signal controls. Because ferry vehicle traffic would queue in the shoulder lane, a red

light would stop ferry traffic so northbound right turns could be completed safely. The estimated proportion of ferry vehicle traffic passing through this intersection is approximately 46 percent in the 2040 PM peak hour, but the growth in traffic from 2010 to 2040 attributed to ferry traffic is approximately 11 percent.

No-Build, Preferred, and Existing Site Improvements Alternatives

WSDOT would work with the City of Mukilteo to define the specific improvement needed to reduce delay, but the following measures would be effective:

- ***Convert the 5th Street westbound right-turn only lane into a shared left-turn/right-turn lane and extend the merge area on SR 525 south of this intersection.*** This would provide additional merge space for traffic turning onto southbound SR 525 from 5th Street southbound. This action would improve the intersection operations to LOS D.

Elliot Point 1 Alternative

During the 2040 PM peak period, the modeled vehicle queue from the toll booths would not extend to SR 525. If ferry and non-ferry traffic combined into the local lane (a shared through/right-turn lane) at the SR 525-5th Street intersection, it would operate at LOS C. However, the improvement described above for the other alternatives would likely be needed during the summer months.

3.7.2 Ferry Crossing Level of Service

By 2040, regardless of whether or not the Mukilteo Multimodal Project is implemented, the Mukilteo-Clinton ferry route is projected to be above the capacity standards described in *Section 3.2.1*. When the standards are exceeded, WSDOT would consider operational strategies identified in the ferry system *Long-Range Plan* to encourage demand to shift to other transit modes such as buses and commuter rail. The Mukilteo Multimodal Project alternatives, including the Preferred Alternative, already incorporate a number of the recommended strategies, including improved transit and non-motorized facilities.

3.7.3 Transit

No-Build and Existing Site Improvements Alternatives

The No Build and Existing Site Improvement alternatives would not require mitigation.

Preferred Alternative

The Preferred Alternative would relocate the current bus stops at the SR 525-Front Street intersection to a transit center east of Mukilteo Station. This relocation would increase the walking distances for some waterfront area destinations. During final design, WSDOT would coordinate with the City of Mukilteo, Sound Transit, Everett Transit, and Community Transit to consider adding new bus stops on the First Street extension.

Elliot Point 1 Alternative

The Elliot Point 1 Alternative would relocate bus stops on SR 525 to the new transit center, and could include the same mitigation measures as the Preferred Alternative.

3.7.4 Parking

This section describes how mitigation measures could reduce the loss of parking capacity near the Mukilteo ferry terminal.

No-Build Alternative

No mitigation is required for this alternative because there is no change in the parking supply.

Preferred Alternative

No mitigation is required because the alternative would create additional public parking spaces to replace public spaces that would be removed.

Existing Site Improvements Alternative

The preliminary design for this alternative would result in a loss of 30 on-street parking spaces near the Mukilteo ferry terminal. Mitigation to offset the loss could be difficult due to the lack of available land, but some spaces could be created on First Avenue or as off-street spaces in coordination with the City of Mukilteo.

Elliot Point 1 Alternative

No mitigation is required because the alternative would create additional public parking spaces to replace public spaces that would be removed.

3.7.5 Construction Mitigation

General Construction Mitigation

Preferred Alternative

As part of permits required by the City of Mukilteo, WSDOT would develop a construction traffic control plan. Anticipated elements of the plan include:

- Scheduling construction activities to minimize traffic disruptions
- Scheduling major activities such as larger concrete pours or large volume deliveries to be outside of peak seasonal or peak commute periods
- Enforcing time restrictions for truck traffic
- Managing truck traffic to avoid multiple trucks traveling simultaneously on local streets, such as Front Street and Park Avenue
- Constructing First Street improvements first and routing all construction traffic on First Street

Elliot Point 1 Alternative

Construction mitigation for the Elliot Point 1 Alternative would be the same as for the Preferred Alternative.

No-Build and Existing Site Improvements Alternatives

A construction traffic control plan would be developed. The No-Build and Existing Site Improvements alternatives would reroute all ferry-related traffic to the Edmonds ferry terminal during Mukilteo ferry terminal closures. The closures would vary in duration for these alternatives. For longer closures of the Mukilteo ferry terminal, WSDOT would do the following:

- ***Communication and education campaign.*** This strategy would alert and educate ferry passengers on how to complete their trip. The campaign would focus on ways to complete a trip without taking a vehicle on the ferry.
- ***Signage.*** Signage elements throughout the region (such as I-5) would redirect traffic to Edmonds. Additional signage around the Edmonds ferry terminal would be needed to provide direction for local circulation and to instruct ferry traffic not to block driveways and intersections.
- ***Passenger-only service from Clinton to Mukilteo.*** During construction it may be feasible to run a passenger-only ferry service from Clinton to Mukilteo to maintain connections to park-and-ride, bus, and rail transit.
- ***Bus service from Edmonds to Mukilteo.*** Bus or shuttle service from the Edmonds ferry terminal to existing bus routes at the Mukilteo ferry terminal or key destinations would maintain multimodal connectivity during construction.
- ***Extended Edmonds ferry terminal shoulder queuing area.*** Based on WSDOT experience in March 2011 with the temporary routing of Mukilteo-Clinton ferries to the Edmonds ferry terminal, additional space for queuing and separating vehicle traffic would be necessary. Two lanes on SR 104 from Dayton Street south to Paradise Lane could be used to separate vehicle traffic destined to Clinton or Kingston.

For short-term closures, WSDOT would provide a broad-based communication program to inform travelers and others, and to minimize disruptions.

Additional Mitigation for Mukilteo Station Parking Impacts

To mitigate the construction impacts of the Preferred and Elliot Point 1 alternatives on access and parking for Mukilteo Station, temporary parking may be needed. WSDOT would coordinate with Sound Transit and the City of Mukilteo to identify additional temporary parking supply and to develop construction staging plans that would minimize impacts on access and parking.