

3.0 Transportation Affected Environment and Environmental Consequences

This section discusses the potential for changes in construction and operational impacts to transportation from the changes in I-90 operations conditions and the Transit Integration configurations described in Section 2.0, Changed Conditions and Project Refinements. Mitigation measures are provided where applicable. Findings are then compared to those in the Final EIS.

As a result of evaluating the changes to I-90 conditions, the following assumptions and inputs have been updated from the analysis completed in the 2011 Final EIS:

- Design year updated from 2030 to 2035
- Updated PSRC land use forecasts and travel demand model (2020 and 2035)
- Updated Sound Transit ridership forecasts and travel demand model (2020 and 2035)
- Tolling on SR 520
- Updated background projects, such as the WSDOT Connecting Washington package
- Updated existing conditions year (2016) with recent transportation data

The transportation assumptions and the methods used for analysis are documented in Attachment B to Appendix A, Transportation Technical Report.

Section 3.2, Transit, describes the proposed changes in bus routes for the Mercer Island Bus Transit Integration configurations that were assumed for the analyses described in this section. This section also describes the number of buses that would be stopping on Mercer Island with each configuration.

3.1 Regional Travel

This section analyzes potential impacts on regional travel based on the changes in I-90 operations and the Transit Integration configurations. The measures for regional travel include vehicle miles of travel (VMT), vehicle hours of travel (VHT), vehicle volume-to-capacity (v/c) ratio, and mode share (see text box). Results are presented for the AM and PM peak periods, which generally have the most congested conditions on a weekday.

Impacts would be similar among the three Transit Integration configurations and therefore they are not discussed in this section.

Regional Travel Analysis Terms

Vehicle miles traveled (VMT): Total number of vehicle miles traveled in a specific geographic area over a given period of time.

Vehicle hours traveled (VHT): Total vehicle hours expended traveling on the roadway network in a specified area during a specified time period.

Average daily traffic (ADT): Total volume of traffic during a given time period divided by the number of days in that time period, representative of average traffic in a one-day time period.

Vehicle volume-to-capacity (v/c) ratio: Ratio of vehicle demand compared to roadway capacity, used as the performance measure to assess travel conditions on the regional facilities in the study area. A v/c ratio of 0.9 and above indicates capacity deficiencies and the need for improved travel efficiency

Peak hour: Hour of the day in which the maximum demand for service is experienced, accommodating the largest number of automobile or transit patrons.

Mode share: Percentage of people using a particular type of transportation (single occupant vehicles [SOV], HOV, or transit).

3.1.1 Affected Environment

Today, the Puget Sound region has almost 76 million VMT daily and over 2 million VHT daily for all users of the transportation system. Forty percent of the daily VMT occurs in the weekday AM (6 to 9 a.m.) and PM (3 to 6 p.m.) peak periods, and over 45 percent of all daily VHT occurs in the AM and PM peak periods.

I-90 connects various freight routes and state highways originating in Seattle, through Mercer Island and Bellevue, to the eastern side of the state and beyond. In 2015, average daily traffic (ADT) volumes on the I-90 floating bridges between Seattle and Mercer Island were about 160,000 vehicles and about 174,000 on the East Channel Bridge. The amount of volume on the floating bridge in the westbound and eastbound directions is fairly evenly split with about 80,000 vehicles per day. About 15,000 vehicles use the reversible center roadway each day (WSDOT, 2015).

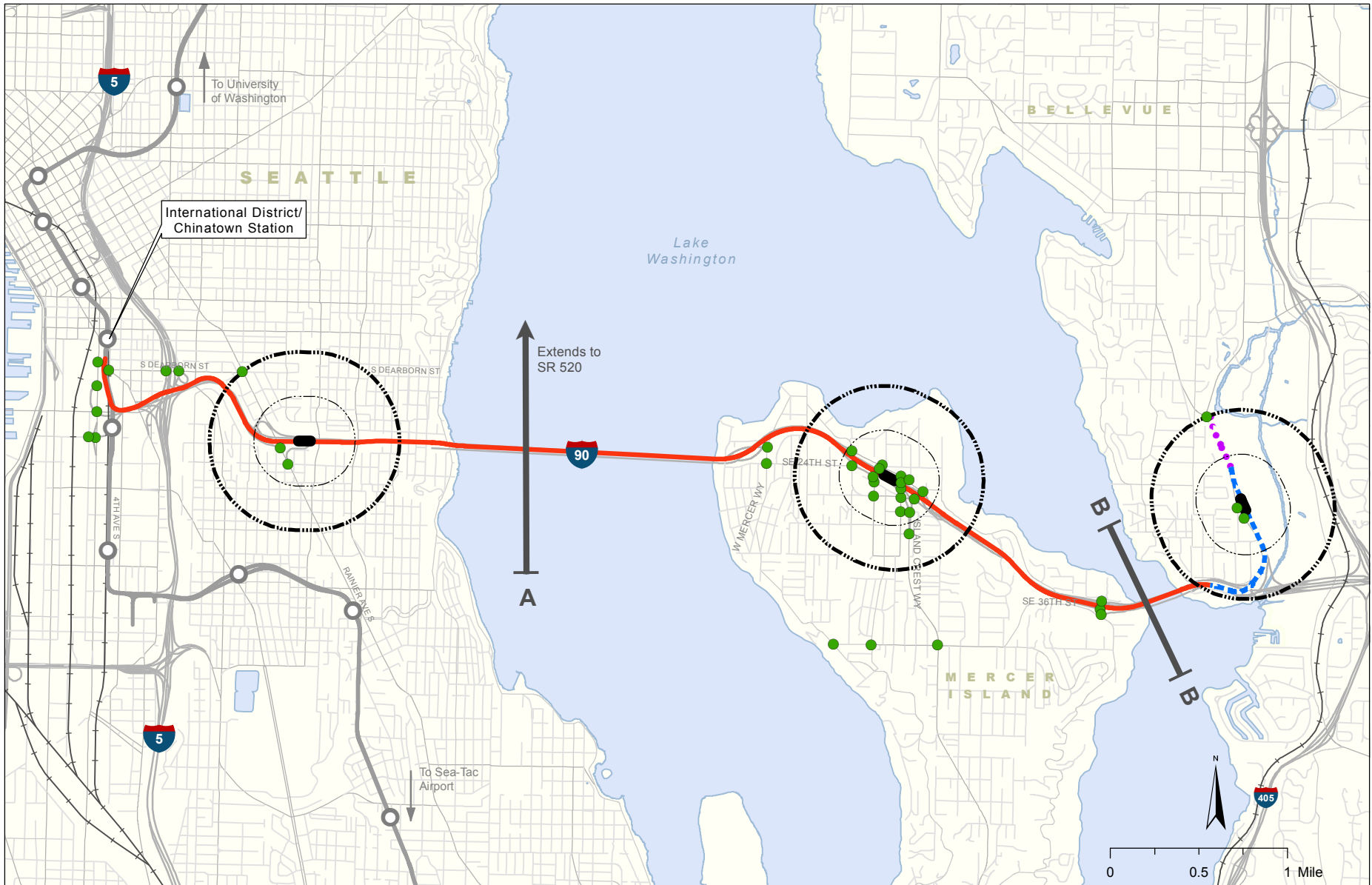
Sound Transit analyzed changes in regional traffic at two screenlines, as shown in Exhibit 3-1:

- **Screenline A:** Lake Washington (including SR 520 and I-90): An east-west screenline located between Seattle and Mercer Island on I-90 and extending north to SR 520
- **Screenline B:** East Channel Bridge (I-90 only): An east-west screenline between Mercer Island and Bellevue Way SE Interchange

These screenlines provide a snapshot of traffic operations and mode share along each corridor based on the travel demand. Note that Screenline A is the same as Screenline 2 in the Final EIS, but Screenline B is new and was not analyzed in the Final EIS. It was added to capture changes between Mercer Island and Bellevue.

Screenline A, which crosses I-90 and SR 520, currently has a v/c ratio above 0.9 for both directions in the PM peak-hour, indicating heavy congestion in both directions. This congestion is expected because these highways are some of the most heavily traveled highways in the region. In the AM peak hour, the v/c ratio is below 0.9 due to lower demand. **Screenline B** currently has a lower v/c ratio than Screenline A, less than 0.9 in the AM and PM, because there are additional lanes between Mercer Island and the Bellevue Way SE interchange that increase roadway capacity.

Mode share in the study area varies depending on the transportation choice, congestion, and land use (e.g., commercial, residential, and retail) surrounding the area. For example, some of the higher HOV and transit mode shares are seen leaving Seattle (Screenline A eastbound) in the PM peak hour. Overall, SOVs have the highest mode share and generally range from about 45 to 70 percent. HOVs generally vary between about 20 and 40 percent, and transit is less, with 5 to 25 percent.



- Study Intersection
- ⊕ Screenline
- ⋯ Sidewalk and On-Street Parking Study Area (1/4 mile)
- ▤ Bicycle Study Area (1/2 mile)
- Preferred Alternative**
- At-Grade Route
- - - Elevated Route
- ⋯ Retained-Cut Route
- ⋯ Retained-Fill Route
- ▬ Tunnel Route
- Traction Power Substation
- Proposed Station
- Central Link Alignment and Station

Source: Data from King County (2006) and modified by CH2M. Updated by CH2M 2017.

Exhibit 3-1 Transportation and Local Street Analysis Study Area
East Link Project

3.1.2 Environmental Impacts

This section compares regional v/c ratios between the No Build condition and the options during construction and operation. Peak period VMT and VHT by year 2020 for the No Build condition is expected to increase by 12 and 19 percent, respectively, compared to existing conditions. No Build condition traffic volumes by year 2020 along I-90 are predicted to grow at an annual average rate of about 0.8 percent in both AM and PM peak periods at both Screenlines A and B. From existing conditions to year 2035, peak period VMT and VHT for the No Build condition are expected to grow by 28 and 64 percent, respectively. Traffic volumes on I-90 by year 2035 are predicted to grow at an average annual rate of about 0.5 percent in both the AM and PM peak periods. Growth to 2035 is slightly less than the construction year (2020) as the transportation system becomes more constrained in the future and operates at or near capacity.

3.1.2.1 Construction Impacts

For the No Build condition and with all options, the westbound and eastbound v/c ratios crossing Screenline A and Screenline B would increase compared with existing conditions, and the v/c ratio at Screenline A would be approximately 1.0 and Screenline B would be just over 0.90, indicating highly congested conditions. V/c ratios would be similar among the options because the roadway capacity at the regional level (including both I-90 and SR 520) is similar.

The mode share across both screenlines would shift among SOVs, HOVs, and transit in the future. The percentage of SOV users in both westbound and eastbound directions would slightly decrease in the No Build condition and with the options as congestion worsens and more people choose alternative modes, such as HOV and transit. Mode share would be similar among the options because the regional transportation system and transit services are similar for all options, although Option 2 would have slightly higher HOV mode share as only HOV and transit are allowed in the HOV lane. Peak period VMT and VHT would also be similar among options during construction, but would be about 2 to 4 percent lower than the No Build condition due to the addition of the R-8A HOV lanes.

3.1.2.2 Operational Impacts

Compared to the No Build condition, the options forecast a slight reduction in the amount of daily auto demand on I-90 because approximately 16,000 people would shift from their current mode of transportation to light rail by 2035. In 2035, peak period traffic demand on I-90 with Option 2 would be slightly lower (about 1 percent less) than Option 1 because there would be less capacity on I-90 for GP vehicles with Mercer Island SOVs not allowed to use the HOV lanes.

V/c ratios are similar between options, but they would improve relative to the No Build condition across Screenline A. The mode share would also be similar between the options and would generally become less dominated by SOVs compared to the No Build condition as the transit share increases with light rail service. Light rail ridership would be similar for both options because there is no difference in the alignment or operations for the light rail system. Both VMT and VHT decrease slightly with the two options as compared to the No Build condition. VMT and VHT are similar between operational conditions.

3.1.3 Mitigation

No mitigation for regional travel impacts would be required because, overall, the v/c ratios and mode share across the screenlines would remain similar to No Build condition or improve with the East Link Extension for all options during construction and operation.

3.1.4 Comparison to Final EIS

Regional trends can be compared to the Final EIS, but not specific results because different operations analysis years are used (2030 in the FEIS vs. 2035 in this Addendum) and Screenline B was not analyzed in the Final EIS. With any of the options during construction or operation, the changes in regional travel are similar to or better than the No Build condition as described in the Final EIS. The v/c ratio would improve and mode share would shift to greater use of HOVs and transit with these options compared to the No Build condition. Also, the VMT and VHT would decrease with the options during 2035 operational conditions, similar to the Final EIS. Potential impacts on regional travel are consistent with the range of impacts in the Final EIS.

3.2 Transit

This section assesses the changes in I-90 operations and the Transit Integration configurations for the following transit performance measures at Screenlines A and B: ridership, service frequency level of service (LOS), hours of service LOS, passenger load LOS, and reliability. The PM peak hour is used for these measures because it is generally the most congested period. Transit travel time along I-90 between Seattle and Bellevue is also provided during the AM and PM peak periods.

This analysis is based on existing and proposed future bus service changes for the No Build condition and the Transit Integration configurations presented in Table 3-1. The same bus routes would operate in the 2020 and 2035 No Build condition as existing conditions, and would continue to use the I-90 D2 Roadway.

Table 3-2 summarizes the number of buses that would be traveling on Mercer Island with each configuration. With the FEIS Configuration, there would be about 200 buses per day stopping on Mercer Island. There would be about 20 buses during the AM peak hour and 20 buses in the PM peak hour. With the 77th Avenue SE and 80th Avenue SE Configurations, 40 buses are expected to travel on 80th Avenue SE during the peak hour. These buses would travel directly to and from I-90 and would travel on 80th Avenue SE between N Mercer Way and SE 27th Street. With the 77th Avenue SE Configuration these buses would also travel on N Mercer Way between 77th Avenue SE and 80th Avenue SE. The number of AM and PM peak-hour buses stopping at the Mercer Island Park-and-Ride would increase by about 20 total compared to the FEIS Configuration because all buses would stop at the park-and-ride, but the total number of daily buses with either the 77th Avenue SE and 80th Avenue SE Configurations (about 320 buses) would decrease compared to the existing and the No Build conditions (about 350 buses).

3.2.1 Affected Environment

In the study area, King County Metro provides fixed-route local and express buses, Americans with Disabilities Act (ADA) paratransit, dial-a-ride, vanpool, ride matching, and park-and-ride services.

During peak periods, the average headway for Metro buses is about 30 minutes. Metro has implemented its *Strategic Plan for Public Transportation 2011-2021* (King County Metro, 2016a), last updated in the spring of 2016, to improve service between residential areas and transit hubs and activity centers.

Table 3-1. I-90 Bus Service Summary - Existing and Proposed Transit Integration Configurations

Route	Existing (2016)/No Build Condition (2020 and 2035)	FEIS Configuration ^a	77th Avenue SE/ 80th Avenue SE Configurations
111	I-90 Only	I-90 Only	Rerouted to Downtown Bellevue
114	I-90 Only	I-90 Only	Rerouted to Downtown Bellevue
201	Mercer Island Only	Mercer Island Only	Deleted
204	Mercer Island Only	Mercer Island Only	Mercer Island Only
212	I-90 Only	I-90 Only	I-90 ending at in Eastgate
214	I-90 Only	I-90 Only	I-90 ending at Mercer Island
215	Does not occur	Does not occur	I-90 ending at Mercer Island
216	I-90 w/stops on Mercer Island	I-90 w/stops on Mercer Island	Replaced with 219
217	I-90 Only	Deleted	Deleted
218	I-90 Only	I-90 Only	I-90 ending at Mercer Island
219	I-90 Only	I-90 Only	I-90 ending at Mercer Island
550	I-90 w/stops on Mercer Island	Replaced by light rail transit	Replaced by light rail transit
554	I-90 w/stops on Mercer Island	I-90 ending at Mercer Island	Rerouted to Downtown Bellevue
630 ^b	Mercer Island to Seattle	Mercer Island Only	Mercer Island Only

^a Routes modified based on the East Link Final EIS Conceptual Bus Integration Plan.

^b Metro route 630 is included in this table because it is a current route on I-90 but in the future is planned to only circulate on the island during peak periods with limited headways and would not affect the technical analysis.

Table 3-2. Mercer Island Park-and-Ride Bus Volumes

Existing/No Build Conditions	FEIS Configuration	77th Avenue SE Configuration	80th Avenue SE Configuration
<u>AM peak hour:</u> 33 buses	<u>AM peak hour:</u> 18 buses	<u>AM peak hour:</u> 40 buses	<u>AM peak hour:</u> 40 buses
<u>PM peak hour:</u> 31 buses	<u>PM peak hour:</u> 19 buses	<u>PM peak hour:</u> 40 buses	<u>PM peak hour:</u> 40 buses
<u>Daily:</u> 352 buses	<u>Daily:</u> 197 buses	<u>Daily:</u> 318 buses	<u>Daily:</u> 318 buses

Within the study area, Sound Transit's Regional Express buses have approximate headways of 10 to 30 minutes. Generally there are more buses and routes in the peak direction than in the opposite "reverse-peak" direction. In the midday hours, off-peak hours, and weekends, many of the routes in the study area only operate with 1-hour headways. Table 3-3 shows transit facilities within the study area.

In the existing condition, the bus routes between Downtown Seattle, Mercer Island, and Bellevue operate at a combined average headway of less than 10 minutes (**service frequency LOS A and B**). Direct transit connections in the study area operate 17 to 20 hours during the day with an **hours-of-service LOS of B or better**.

Transit Levels of Service

For transit, LOS A indicates frequent peak-period service, more hours served during the day, high on-time performance, and minimal passenger crowding in a transit vehicle. Conversely, LOS F indicates infrequent or irregular service, minimal service hours, poor reliability, and passenger crowding in the vehicle.

Table 3-3. Existing and Proposed Bus Transit Facilities in Study Area

Transit Facility	Type of Facility	Rider Amenities (Existing/Future)	Number of Routes	Parking Stalls (Existing/Future)
Mercer Island Park-and-Ride	Park-and-ride	Storage for 40 bikes/storage for 80-100 bikes	Existing: 4 KCM, 2 ST FEIS Configuration: 4 KCM, 1 ST Proposed: 6 KCM, 0 ST	447/No change
South Bellevue Park-and-Ride	Park-and-ride	Storage for 40 bikes/storage for 120 bikes	Existing: 3 KCM, 4 ST FEIS Configuration: 3 KCM, 3 ST Proposed: 5 KCM, 4 ST	519/1,500

Note: Existing transit routes and parking stalls listed as of summer 2016.

Source: King County Metro (2016b).

ST Sound Transit

KCM King County Metro

The **passenger load LOS** is C or D for both screenlines for the westbound direction in the AM peak hour and in the eastbound direction in the PM peak hour. This indicates that passenger overcrowding is a potential issue and could impact stop dwell times and reliability. Screenline A has the highest passenger load with slightly more than 1 passenger per seat for westbound AM buses and eastbound PM buses, indicating that buses are overcrowded. The passenger load LOS is A at both screenlines in the non-peak directions.

King County Metro had a systemwide on-time performance of 74.9 percent in 2015, which is below their target of 80 percent (King County Metro, 2016c). More buses in the PM peak and that travel on highways were late, due to higher traffic congestion and ridership activity than during other times of the day. This may reflect lower than expected **reliability** in the study area. Sound Transit routes that serve the study area were on-time 82 percent of the time in 2016.

3.2.2 Environmental Impacts

This section compares the transit performance measures described in Section 3.2.1 for the No Build condition and the options during construction and operations.

3.2.2.1 Construction Impacts

During construction, buses would no longer be able to use the center reversible roadway and would travel in the outer roadways in either the new R-8A HOV lanes or GP lanes. The existing Rainier Avenue S flyer stop would be closed and a few bus routes would still provide bus service to this area by accessing I-90 from the Rainier Avenue S interchange, with stops on Rainier Avenue S and S Jackson Street. These changes would affect buses traveling along I-90, requiring them to weave across the GP lanes to access the HOV lanes because buses would continue to stop at Mercer Island. Buses would continue to use the D2 Roadway until mid-2018, when it will be closed for East Link construction. At this time, buses would be rerouted to the I-90 outer roadway to access Rainier Avenue S, 4th Avenue, or Edgar Martinez Drive S.

The 2020 AM and PM peak-period **transit travel times** between Seattle and Bellevue are shown in Table 3-4. Option 2 travel times in the AM peak westbound directions would be the same as the No Build condition and at least 3 minutes faster than Options 1 and 3 because only HOVs and transit would be using the R-8A HOV lane. In the AM eastbound direction, transit travel times would be worst with Option 3 because there would be no HOV lane between Seattle and Mercer Island.

Table 3-4. AM and PM 2020 Construction I-90 Transit Travel Times Between Seattle and Bellevue (minutes)

Time Period/Condition	I-90 Westbound ^a	I-90 Eastbound ^a
AM Peak Period		
No Build	18.5 (18.6)	16.3 (16.7)
Option 1	22.0 (22.1)	17.0 (17.6)
Option 2	18.4 (18.7)	16.8-18.5 (17.4-19.0) ^b
Option 3	22.2 (22.3)	17.9 (18.5)
PM Peak Period		
No Build	18.8 (20.4)	13.7 (14.6)
Option 1	15.9 (17.0)	18.6 (19.2)
Option 2	15.9 (16.5)	18.1-19.1 (18.7-19.6) ^b
Option 3	16.9 (17.9)	19.9 (20.6)

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and Island Crest Way (ICW) HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and ICW HOV ramps

Option 3 - HOV lane between Mercer Island (MI) and Seattle converted to GP lane during construction

Transit travel times to and from Mercer Island are provided in Section 3.3.

^a The value outside the parentheses represents bus travel times between Seattle at the International District Station and I-405. The value inside the parentheses represents bus travel times between Seattle and South Bellevue Park-and-Ride.

^b Range of Option 2 results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

In the PM eastbound direction, transit travel times would be similar for all options, but longer than the No Build condition because buses could not use the center roadway. Westbound in the PM peak period, bus travel times would be improved for all options compared to the No Build condition because of increased capacity on I-90. Among the options, the shortest bus travel time would generally be with Option 2 because buses would be in an HOV lane designated for only HOV and transit. The longest bus travel time would generally be with Option 3 because buses would travel in a GP lane with SOVs. Transit travel times to and from Mercer Island are provided in Section 3.3.

For both the No Build condition and options during construction, existing routes would have more frequent headways due to planned service improvements, improving the service frequency LOS, hours of service LOS, and passenger load LOS. There would be little difference in these measures among the options because they are based on the route schedules, which would be the same for all options. Even though many of the bus routes are planned to have more frequent headways, buses would likely be unable to meet their scheduled headways in the future due to additional congestion on roadways, affecting reliability. I-90 transit travel time with Option 2 would be similar to or shorter than the other options because only buses and HOVs would be allowed to use the I-90 HOV lanes; therefore, reliability could be better with this option.

3.2.2.2 Operational Impacts

In 2014, King County Metro provided Sound Transit updated service changes for the bus transit integration with light rail service at the Mercer Island Station. The updated bus services are identified in the Transportation Technical Report. These service changes were used in this analysis for the 2035 the No Build condition and the options. The updated services include changes to the current bus headways and routes to meet future demand.

For the No Build condition and the FEIS Configuration, several existing routes are proposed to be modified as part of the service integration. Existing routes providing service between Mercer Island and Downtown Seattle would have improved frequency in the future. For the 77th and 80th Avenue SE Transit Integration configurations, bus routes that provide parallel service to the light rail service areas would be reduced or eliminated, although some routes would be modified to terminate at the Mercer Island and South Bellevue stations where passengers would transfer to and from light rail. As described in Section 2.2, no buses would operate on I-90 between Mercer Island and Seattle with these two configurations when light rail is in operation.

The 2035 peak period **transit travel times** between Seattle and Bellevue are shown in Table 3-5. Light rail travel times in the options between South Bellevue and the International District Station would be the same for all options and times of day. With the 77th and 80th Avenue SE Transit Integration configurations, buses from the Eastside would travel only to Mercer Island and not continue into Seattle. In the FEIS Configuration, buses traveling in the reverse-peak direction (eastbound in the AM and westbound in the PM) do not stop on Mercer Island and therefore it is not a direct comparison to the light rail travel patterns, so those travel times are also not provided in the table below. Transit travel times to and from Mercer Island are provided in Section 3.3.

Table 3-5. AM and PM 2035 I-90 Transit Travel Times between Seattle and Bellevue (minutes)

	Transit Integration Configurations	Westbound		Eastbound	
		Bus	Light Rail	Bus	Light Rail
AM Peak Period					
No Build ^a	N/A	17.6 (17.6)	N/A	15.6 (16.0)	N/A
Option 1	77th Ave. and 80th Ave. Configurations	N/A	14.0	N/A	14.0
	FEIS Configuration	22.3	14.0	N/A	14.0
Option 2	77th Ave. and 80th Ave. Configurations	N/A	14.0	N/A	14.0
	FEIS Configuration	19.6-20.7 ^b	14.0	N/A	14.0
PM Peak Period					
No Build ^a	N/A	18.9 (20.5)	N/A	13.7 (14.5)	N/A
Option 1	77th Ave. and 80th Ave. Configurations	N/A	14.0	N/A	14.0
	FEIS Configuration	N/A	14.0	19.1	14.0
Option 2	77th Ave. and 80th Ave. Configurations	N/A	14.0	N/A	14.0
	FEIS Configuration	N/A	14.0	22.3-22.3 ^b	14.0

Note:

Option 1 - Mercer Island SOVs allowed in HOV lane and ICW HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and ICW HOV ramps

Travel time does not include time to transfer between bus and light rail.

^a The value outside the parentheses represents bus travel times between Seattle at the International District Station and I-405. The value inside the parentheses represents bus travel times between Seattle and South Bellevue Park-and-Ride.

^b Range of Option 2 results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

Compared to the No Build condition, buses with the FEIS Configuration would generally experience longer travel times on I-90 between Bellevue and Seattle for Options 1 and 2, with more congestion in the HOV lane during the westbound AM peak period with Option 1 than for Option 2 (see Section 3.3, Highway Operations and Safety). With the FEIS Configuration, bus travel time westbound in the AM peak with Option 1 would be up to 5 minutes longer than the No Build condition, compared to 2 minutes longer with Option 2. In the PM peak period in the eastbound direction, bus travel time with the FEIS Configuration would be 5 to 8 minutes longer with either option compared to the No Build condition.

Transit travel times between Seattle and Bellevue with either the 77th Avenue SE or 80th Avenue SE Transit Integration configurations would be provided by light rail in both Options 1 and 2. In both AM

and PM time periods and both I-90 directions, the light rail travel time on I-90 is the same as or up to 8 minutes shorter than the bus travel time in the No Build condition and the FEIS Configuration. The 77th Avenue SE and 80th Avenue SE configurations would have similar or better transit travel times between Bellevue and Seattle as the FEIS Configuration even with a transfer from bus to light rail on Mercer Island because light rail would have a faster travel time between Seattle and Mercer Island.

The Sound Transit ridership forecasting model was used to develop the 2035 daily light rail system **ridership** estimates associated with the project. Projectwide ridership would serve approximately 62,000 daily riders in 2035 with the 77th Avenue SE or 80th Avenue SE Transit Integration configurations, with 16,000 of these riders shifting from a non-transit mode to light rail. The 2035 daily boardings at the Mercer Island Station are expected to be 3,000 for both options with the FEIS Configuration or 6,000 for both options with the 77th Avenue SE or 80th Avenue SE configurations. The increase is due to riders transferring between bus and light rail.

Both the No Build condition and Options 1 and 2 existing routes would have a **service frequency LOS** of LOS A between Mercer Island and Seattle. Service frequency results for the FEIS and Transit Integration configurations would be similar because light rail would provide frequent service throughout the corridor.

In the No Build condition, the **hours of service LOS** would operate at LOS B or better, similar to existing conditions. For both options, the hours of service would be LOS A between all areas directly connected by light rail. Hours of service results are similar for all Transit Integration scenarios because light rail service would provide the same hours of service throughout the corridor.

By 2035, the **passenger load LOS** of light rail with Options 1 or 2 would operate at LOS C or better. In comparison, the No Build condition bus service would range from LOS B to E, depending on time of day and direction. For both options, there would be no bus trips at Screenline A with the Transit Integration configurations. The FEIS Configuration bus passenger load LOS in the eastbound direction would degrade compared to the No Build condition to LOS F across Screenline A. Across Screenline B, bus passenger load LOS for the FEIS Configuration would improve from the No Build condition to LOS C or better. For the FEIS Configuration, the passenger load LOS of the light rail would operate at LOS A in both directions as there would be less riders transferring between bus and light rail with bus service continuing into Seattle.

Even though many of the bus routes are planned to have more frequent headways, buses would likely be unable to meet their scheduled headways in the future due to additional congestion and travel time on roadways in the No Build condition and with the options. Between Mercer Island and Seattle, both options with the Transit Integration 77th Avenue SE and 80th Avenue SE configurations would have high **reliability** because light rail would be the only form of transit on I-90. With the FEIS Configuration, both options would have longer bus travel times (between 2 and 5 minutes longer) in the AM peak westbound direction compared to the No Build condition. Option 2 would have less congestion in the HOV lane in the AM westbound peak period between Mercer Island and Seattle, which would improve transit travel times and reliability compared to Option 1. For the AM peak eastbound direction,

congestion would be similar between the options with the FEIS Configuration and the No Build condition, and therefore reliability is expected to be similar. In the PM peak eastbound direction, bus travel times for both options with the FEIS Configuration would be between 5 to 8 minutes longer and buses would have lower reliability compared to the No Build condition. In the westbound direction in the PM peak, bus travel time for both options with the FEIS Configuration would be about 6 minutes shorter compared to the No Build condition because the new R-8A HOV lanes would provide higher reliability. For the FEIS Configuration, light rail would provide greater transit reliability between Seattle and Mercer Island than buses under both options. For the 77th Avenue SE and the 80th Avenue SE Transit Integration configurations, buses traveling to and from east of Mercer Island would have similar reliability between options because congestion would be similar between these options.

3.2.3 Mitigation

During construction, no mitigation would be required for transit beyond what was identified in the Final EIS, which included roadway modifications in Seattle for buses headed to downtown once the D2 Roadway closes to buses in 2018. Additionally, the R-8A HOV lanes would be completed prior to East Link construction.

During East Link operations, bus routes on I-90 would not require mitigation because the R-8A HOV lanes would be completed prior to East Link construction and would be used with the FEIS Configuration. For the Transit Integration configurations, bus routes would not operate on I-90 west of the Mercer Island Station and would continue to use the existing HOV lanes to the east.

3.2.4 Comparison to Final EIS

During construction, bus travel times would be longer than the No Build condition, the same as was stated in the Final EIS.

During operation, light rail would provide better transit LOS than the No Build condition, as stated in the Final EIS. Under the FEIS Configuration, buses would experience additional impacts as travel times increase from the No Build condition. The Transit Integration scenarios would be a change from the Final EIS. With Transit Integration, bus service between Mercer Island and Seattle is replaced with light rail, improving travel times and transit level of service from the No Build condition; therefore no additional impacts are expected.

There would be no change in mitigation measures from the Final EIS, and impacts from the change in I-90 Operations and the Transit Integration configurations are within the range of impacts and alternatives in the Final EIS.

3.3 Highway Operations and Safety

This section analyzes operations specifically on I-90. The three key operating measures used to evaluate operating conditions on I-90 are **vehicle and person throughput, travel time, and LOS. Safety** is also discussed in terms of the change in predicted crashes along I-90. There would be no difference in impacts between Transit Integration configurations and therefore they are not discussed in this section.

Compared to the Final EIS, the measures used in this section are similar but the methodology to develop them has been updated. In this section, throughput and travel times data are provided for the peak period, while in the Final EIS, the data presented were either for the peak period or peak hour. Additional updates to the methodology have been incorporated since the Final EIS and are described in Appendix A, Transportation Technical Report.

3.3.1 Affected Environment

I-90 has an average daily traffic (ADT) volume of 160,000 on the floating bridge (Screenline A) and 174,000 on the East Channel Bridge (Screenline B). About 15,000 vehicles per day use the center roadway and about 6,500 of these go to or from Mercer Island. In the existing conditions, 55 to 60 percent of the total number of vehicles on I-90 travel in the peak direction (westbound in the AM peak period and eastbound in the PM peak period). In the AM peak period, a little over 17,000 vehicles use I-90 to or from Mercer Island. This increases to slightly under 21,000 vehicles in the PM peak period. For an average day, about 68,000 vehicles use I-90 to or from Mercer Island. About 60 percent of daily trips and 55 percent of peak period trips (AM and PM combined) go to and from Mercer Island and the Eastside, while about 40 percent of daily trips and 45 percent of peak period trips are to and from Seattle (WSDOT, 2016a). Exhibit 3-2 shows the AM and PM peak period travel patterns to and from Mercer Island.

In the AM peak period at Screenline A, **vehicle throughput** is approximately 40,600, while in the PM peak period, it is about 41,300. In both AM and PM peak periods, the center roadway accommodates less than 15 percent of the total vehicles on I-90, due to its limited access. Vehicle throughput at Screenline B is 43,000 and 45,000 in the AM and PM peak periods, respectively.

In terms of **person throughput**, in the AM peak period at Screenline A, about 60,200 people travel in both directions, including about 17,200 in the center roadway. In the PM peak period, about 62,100 people travel in both directions, with about 16,300 in the center roadway. At Screenline B, about 62,000 people travel in both directions during the AM peak period and about 65,600 people travel in both directions in the PM peak.

Highway Operations Analysis Terms

Peak Period: The peak period analyzed for highway operations was 6:30 to 10:00 a.m. and 3:30 to 7:00 p.m.

Vehicle and person throughput: Vehicle and person throughput indicates the number of vehicles and people in vehicles that crosses a location (also called a screenline). Compared with vehicle throughput, person throughput is a more appropriate transit assessment measure because it illustrates the overall efficiency of the system through the number of people able to move.

Travel time: Travel time is how long it would take someone to travel from one location to another location. It is presented individually for each mode (SOV, HOV, and transit) and combined for all modes. It is developed by summarizing the travel times to and from each of the I-90 ramps on Mercer Island.

Level of service (LOS): LOS descriptions indicate when, how long, and how severely congestion occurs. LOS is useful to understand where poorly operating (i.e., LOS E and F) sections of the highway are located.



Exhibit 3-2. Existing AM and PM Peak Period Travel Patterns To/From Mercer Island

Travel times on I-90 were computed between:

- Mercer Island (average of all on and off ramps) to and from Seattle (at I-90 and 4th Avenue S) and Mercer Island to and from the I-405 interchange, and
- Seattle (at I-90 and 4th Avenue S) and the I-405 interchange or to the South Bellevue Park-and-Ride (for transit only).

Exhibits 3-3 and 3-4 show the existing AM and PM travel times for SOV, HOV, and transit modes for the paths described above. For trips to and from Mercer Island Exhibit 3-3 provides an average person travel time that includes all on- and off-ramps (including W Mercer Way, 76th Avenue SE/77th Avenue SE, 80th Avenue SE, Island Crest Way, and E Mercer Way), and weighted by all modes. For example, the existing AM peak travel time for westbound SOV trips from Mercer Island to Seattle is 9.1 minutes when considering all on-ramps, with the shortest travel time being 6.7 minutes from the 77th Avenue SE center roadway on-ramp and the longest 15.9 minutes from the E Mercer Way on-ramp. When including all travel modes, including people in HOV and transit, the average person travel time from Mercer Island to Seattle in the AM peak is 9.3 minutes.

SOV and HOV travel times on I-90 to and from Mercer Island are up to about 9 minutes to and from Seattle, and about 5.5 minutes or less to and from I-405. Transit travel times to and from the island are longer because these times include travel to and from the Mercer Island Park-and-Ride via surface streets.

Travel times for SOVs are generally longer than for HOVs in each direction during the AM and PM peak periods because congestion in the GP lanes is worse than in the HOV lanes on I-90. Between Seattle and Bellevue, HOVs have shorter travel times than SOVs in the westbound direction of I-90 in the morning peak and in the eastbound direction of I-90 in the afternoon peak due to the HOV lanes east of Mercer Island and the reversible center roadway across Lake Washington.

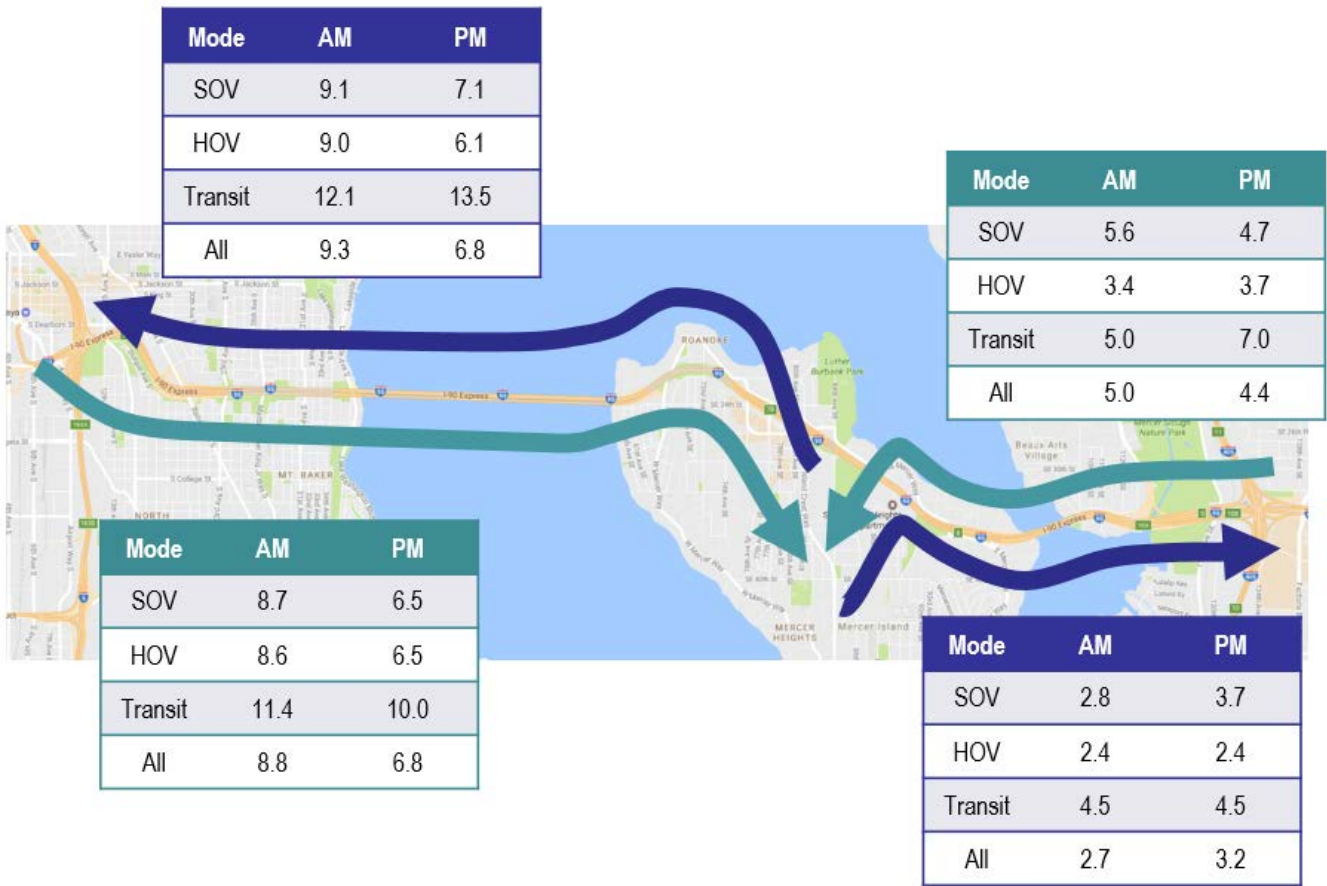


Exhibit 3-3. Existing AM and PM Peak Period Travel Times To/From Mercer Island

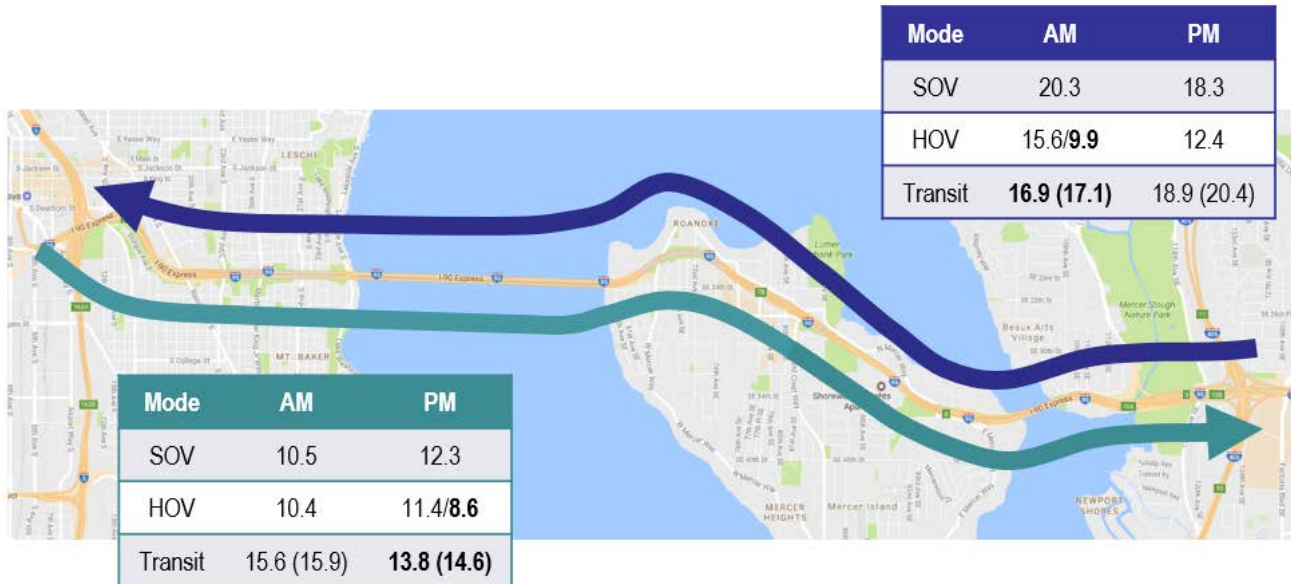


Exhibit 3-4. Existing AM and PM Peak Period Travel Times Between Seattle and Bellevue

Note: Bold text represents travel times for vehicles in the I-90 center roadway. Values in parentheses represent transit travel times to/from the South Bellevue Park-and-Ride.

The **LOS** on I-90 varies throughout the study area. Substantial congestion occurs during portions of the peak period on I-90, and when that occurs vehicles travel in stop-and-go conditions (LOS F). Vehicle queues are observed throughout most of the peak periods, especially in the PM peak period. WSDOT's operational policy for managing HOV facilities is 45 mph or faster at 90 percent of the peak period. The outer roadway HOV lanes east of Mercer Island currently operate at over 45 mph 100 percent of the time and meet WSDOT policy in both directions and during both AM and PM peaks.

Crash data were collected from WSDOT for the I-90 mainline, ramps, and ramp terminal intersections within the study area for the most recent 5 years of data (2011-2015) for the safety analysis. More than 2,200 crashes were recorded on the mainline of I-90 and interchanges in the study area during this time, with the majority of them (approximately 70 percent) being incidents involving property damage only that did not involve any reported injuries or fatalities.

In addition to I-90 mainline crashes, the interchanges (ramps and ramp terminal intersections) with the highest number of reported crashes in the study area are the Rainier Avenue S interchange (with 81 total crashes) and the Island Crest Way interchange (with 42 total crashes). All other interchanges within the study area recorded fewer than 25 crashes.

At the Island Crest Way interchange, the westbound on-ramp to the outer roadway was designed for low peak-period and daily volumes with a minimal taper rate and short ramp acceleration length. The average daily traffic (2015 ADT) volume on this ramp is approximately 2,000 vehicles. This compares with an ADT of about 4,000 vehicles on each of the 76th Avenue SE and W Mercer Way on-ramps. On the I-90 westbound mainline in the vicinity (1,000 feet before and after) of the Island Crest Way westbound left-side on-ramp and along the ramp, there have been almost 60 crashes. For the period of 2011 to 2015, there was a total of 20 crashes that occurred on the left-side Island Crest Way on-ramp. The 76th Avenue SE and W Mercer Way on-ramps experienced 6 and 8 crashes, respectively, during the same time period.

Over the course of the 5 years of crash data collected, more crashes occurred every year up through 2015. This is generally consistent with increases in volume in the corridor over this period.

3.3.2 Environmental Impacts

This section describes impacts to highways operations and safety on I-90 for the No Build condition and the options during construction and operations. Future travel patterns to and from Mercer Island during both construction and operations years would be similar to existing travel patterns (see Exhibit 3-2). Congestion and LOS on I-90 are generally better with the options than with the No Build condition because the R-8A HOV Lanes project (in both construction and operations) and light rail service (when in operations) shift travel modes and provide additional capacity along I-90.

Traffic modeling indicates that in the future there would be congestion in the eastbound direction of I-90 near the Mount Baker Tunnel in Seattle. Based on forecasted traffic volumes and assumptions, this could be more evident in the No Build condition and Option 2. The traffic congestion in this area will be monitored by WSDOT to determine whether conditions warrant further analysis of potential modifications to the HOV lane transition to improve operations between I-5 and the Mount Baker

Tunnel. This operational adjustment could not be made until after 2018 when the D2 Roadway closes to buses.

3.3.2.1 Construction Impacts

Before light rail construction occurs, I-90 and the reversible center roadway would be closed, and the R-8A HOV lanes would be completed from Mercer Island to Seattle. As a result, all buses, HOVs, SOVs, and Mercer Island drivers would use the outer roadways.

Vehicle and Person Throughput

Peak-period person and vehicle throughput information for the No Build condition and the options is presented in Table 3-6.

Table 3-6. Vehicle and Person Throughput - 2020 Construction Peak Periods

Throughput	Screenline A (Lake Washington)				Screenline B (East Channel Bridge)			
	No Build	Option 1	Option 2 ^a	Option 3	No Build	Option 1	Option 2 ^a	Option 3
AM Peak Period								
Vehicle	41,200	43,300	41,300-42,100	43,700	43,400	45,200	44,000-44,700	45,100
Person	63,600	65,700	63,500-64,800	66,100	65,200	66,500	65,200-66,100	66,500
Person Throughput Change from No Build	N/A	3%	0% - 2%	4%	N/A	2%	0%-1%	2%
PM Peak Period								
Vehicle	41,600	45,900	44,200-46,000	46,900	45,200	49,100	47,600-48,800	50,000
Person	64,500	68,500	67,900-70,200	69,700	67,600	70,800	70,300-71,900	72,000
Person Throughput Change from No Build	N/A	6%	5%-9%	8%	N/A	5%	4%-6%	6%

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and ICW HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and ICW HOV ramps

Option 3 - HOV lane between MI and Seattle converted to GP lane during construction

^a The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

Vehicle throughput would increase overall with the options during construction. It would be lower than the No Build condition in the peak directions, but would be higher in the reverse-peak directions because the R-8A HOV lanes would be completed, resulting in an overall increase in vehicle throughput. Total vehicle throughput across Lake Washington (Screenline A) with Option 2 is lower than the other options during the AM peak period and in the PM peak period because only HOVs and transit would use the R-8A HOV lane.

Total person throughput for the options during construction compared with the No Build condition would be similar or up to 4 percent higher for the AM peak period and 4 to 9 percent higher for the PM peak period. Person throughput would be 1 to 2 percent less in Option 2 compared to the other options during the AM peak period. Option 2 serves 1 to 2 percent more people during the PM peak period at Screenline A compared to the other options.

Travel Times To and From Mercer Island

Table 3-7 provides the composite overall travel time during East Link construction for travel on I-90 to and from Mercer Island and Bellevue and Seattle. This travel time considers all directions of travel on I-90 and Mercer Island and is weighted by person for all modes (SOV, HOV, and transit). I-90 travel times for all modes to and from the island would be similar or improved between the No Build condition and the options, except for Option 3 in the AM peak period. With Option 3, HOV and transit trips westbound in the AM peak would see an increase in travel time without the HOV lane between Mercer Island and Seattle. Most people from Mercer Island who travel on I-90 would experience a similar travel time with either option. For some people travel time would increase or decrease, but overall the differences offset each other. Attachment E, I-90 Person-Weighted Travel Times to and from Mercer Island, of Appendix A, Transportation Technical Report, provides detailed travel times from specific I-90 ramps on Mercer Island by mode, peak period, and analysis year.

Table 3-7. 2020 I-90 Travel Time Summary To and From Mercer Island between Seattle and Eastside (minutes)

Condition	AM Peak Period	PM Peak Period
No Build	7.1	6.4
Option 1	6.8	5.4
Option 2 ^a	7.0-7.0	6.0-6.2
Option 3	7.5	5.9

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and ICW HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and ICW HOV ramps

Option 3 - HOV lane between MI and Seattle converted to GP lane during construction

Travel times are person-weighted based on all modes (SOV, HOV, and transit) and consider all I-90 ramps on Mercer Island.

^a The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

Exhibits 3-5 and 3-6 show the travel times by mode (SOV, HOV, and transit) for the AM and PM peaks to and from Mercer Island and Bellevue and Seattle in 2020. AM and PM peak period person-weighted travel times by direction for all modes to and from Mercer Island are generally expected to be similar to or better than the No Build condition, with some exceptions. The following discussion further compares the options and the No Build condition.

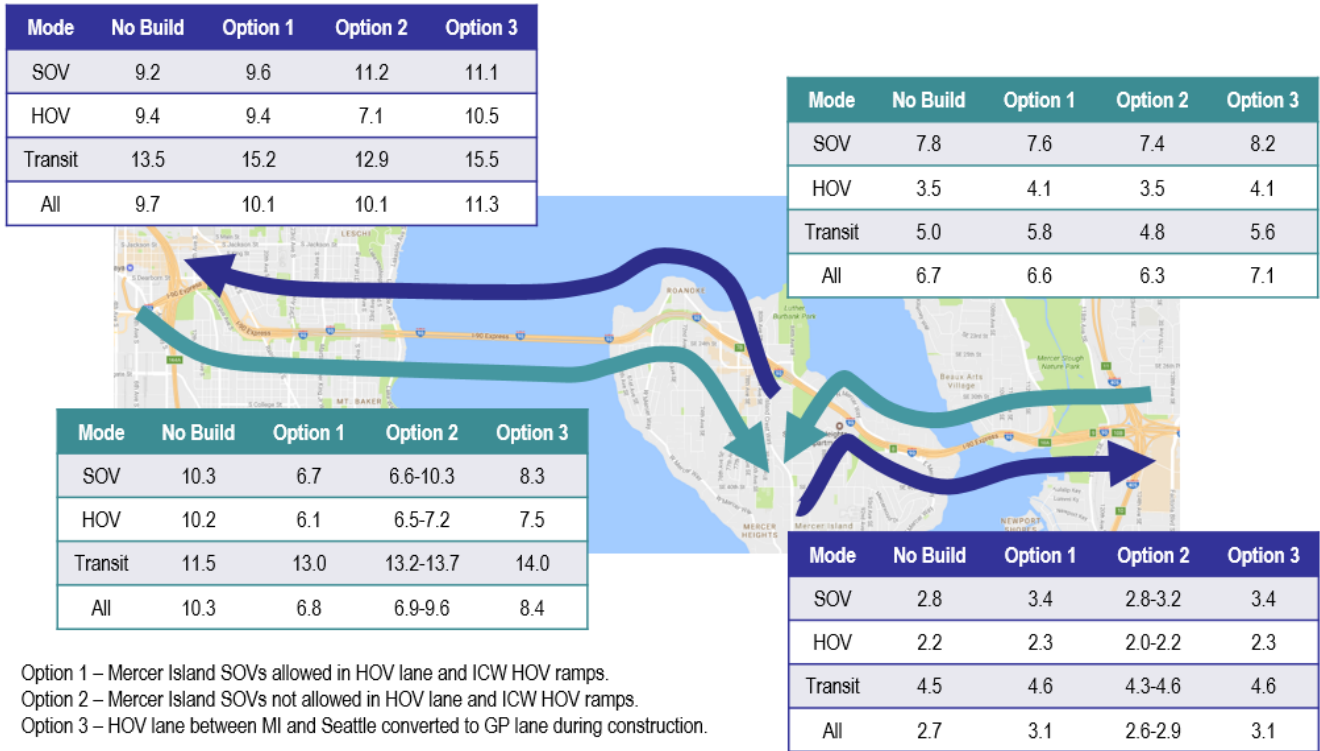


Exhibit 3-5. 2020 AM Peak Period Travel Times To/From Mercer Island

Note: The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

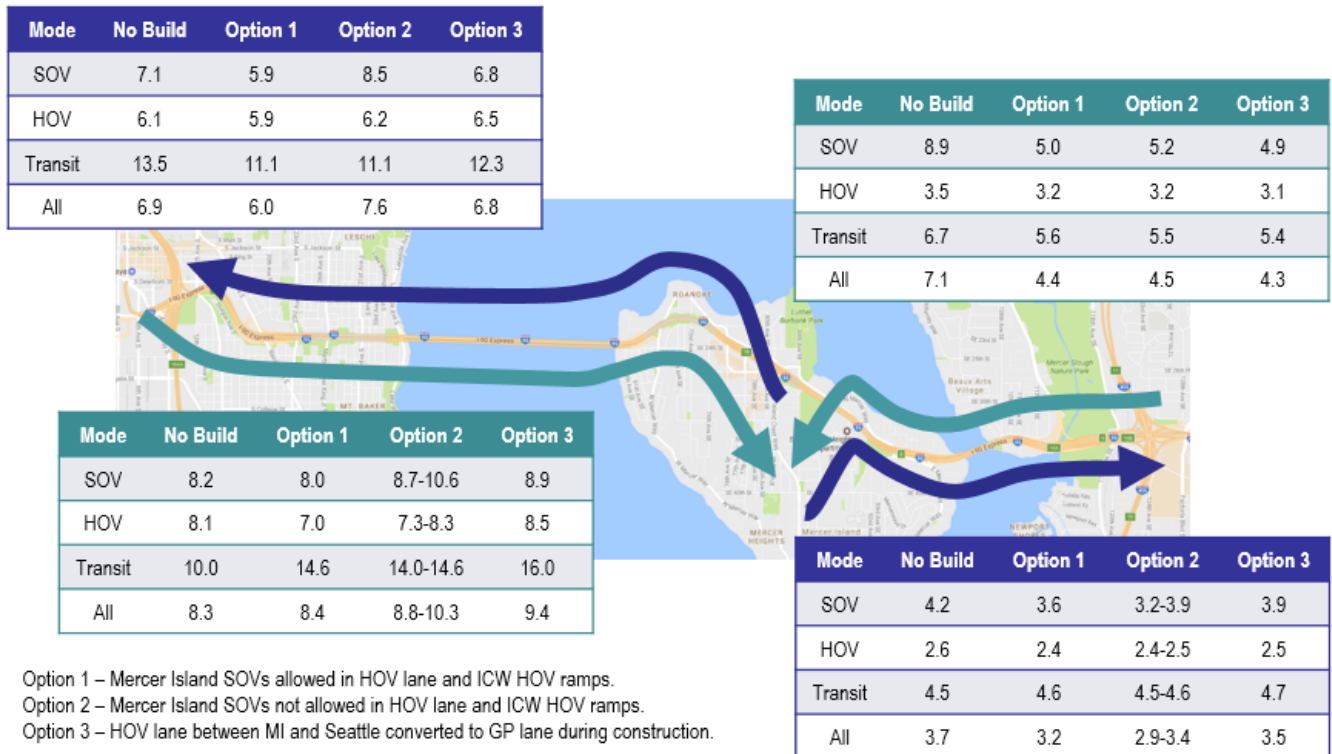


Exhibit 3-6. 2020 PM Peak Period Travel Times To/From Mercer Island

Note: The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

AM Peak Period

SOV travel times in the AM peak from Mercer Island to Seattle (westbound) would be similar between the No Build condition and Option 1, but would be approximately 1.5 to 2 minutes longer in Options 2 and 3 because more SOV vehicles use the GP lanes.

Eastbound SOV trips from Seattle to Mercer Island would be lower than the No Build condition for all 3 options. Option 2 SOV travel time could range from the same as Option 1 or be 3 to 4 minutes longer than Option 1, which is similar to the No Build condition. Eastbound travel time for Option 3 would be in between Option 1 and the No Build condition. Westbound SOV travel times from Bellevue to Mercer Island would generally be similar between the No Build condition and Options 1 and 2 but up to 0.5 minute longer in Option 3 than the No Build condition. Eastbound SOV travel times from Mercer Island to Bellevue would be up to 0.5 minute longer in Options 1 and 3 compared to the No Build condition or Option 2.

HOV travel times in the AM westbound direction between Mercer Island and Seattle would, on average, be about 2 minutes faster in Option 2 than the other options and No Build condition with fewer vehicles using the HOV lanes. Westbound HOV travel times from Bellevue to Mercer Island would also be the shortest in Option 2 by about 0.5 minute compared to the other options. Eastbound HOV trips from Seattle to Mercer Island would take up to 1.5 minutes longer with Option 3 than the other options, but all options would be lower than the No Build condition. Eastbound HOV travel from Mercer Island to Bellevue would be similar between the No Build condition and all options.

Transit travel times in the AM westbound direction would be shorter with Option 2 than with the No Build condition or the other options. Options 1 and 3 would have longer transit travel times than the No Build condition because buses would not be able to use the center roadway and the outer roadway westbound HOV lane would include either Mercer Island traffic or be a GP lane. Transit travel times eastbound from Seattle to Mercer Island in the AM peak would be 1.5 to 2.5 minutes longer with all options because buses would not be able to use the D2 Roadway once closed for East Link construction.

PM Peak Period

Eastbound SOV travel times in the PM peak from Seattle to Mercer Island would vary between the No Build condition and the options. Option 1 would have slightly faster travel times among the options and be similar to the No Build condition, while Options 2 and 3 could range from less than a minute longer compared to the No Build condition to up to 2.5 minutes with Option 2. Westbound SOV travel times in Option 2 between Mercer Island and Seattle would be 2 to 2.5 minutes longer than in Options 1 and 3. SOV travel time westbound between Bellevue and Mercer Island would be up to 4 minutes faster with all options compared to the No Build condition. Eastbound SOV travel time between Mercer Island and Bellevue would be similar to improved by up to one minute in all options compared to the No Build condition.

In the PM peak, HOV travel times in both directions between Mercer Island and Seattle would be similar to improved with Options 1 and 2 compared to the No Build condition. In Option 3, HOV travel times would be slightly longer than the other options because the HOV lane is converted to a GP lane.

HOV travel times between Mercer Island and Bellevue would be similar in both directions for all options and the No Build condition.

Transit travel times in the PM eastbound direction would be longer for all options compared to the No Build condition because the D2 Roadway would be closed. Options 1 and 2 would be up to 2 minutes shorter than Option 3 because the R-8A HOV lane would be converted to a GP lane in Option 3. In the westbound direction to and from Mercer Island, transit travel time would be faster for all options compared to the No Build condition. Transit westbound between Mercer Island and Seattle would be up to 2.5 minutes faster in Options 1 and 2 compared to the No Build condition. Transit travel times in Option 3 would be a minute longer than in Options 1 and 2.

Travel Times Between Seattle and Bellevue

Exhibits 3-7 and 3-8 show the travel times for the AM and PM peak periods between Bellevue and Seattle in 2020. SOV peak-period travel times would be similar or improved from the No Build condition in both directions with the westbound PM direction showing substantial improvement of about 5 to 10 minutes. In the AM peak westbound direction, HOV travel times in Option 2 are similar to the No Build condition because the HOV lane is only available for HOV and transit, while in Options 1 and 3, the HOV travel times would be up to 5 minutes longer when compared to an HOV using the center roadway in the No Build condition. In the eastbound direction, HOV travel times in the AM peak would be faster for all options compared to the No Build condition, although the longest travel time would be with Option 3. HOV travel times in the PM peak eastbound direction would be similar for Options 1 and 2 compared to the No Build condition, but take up to 2.5 minutes longer in Option 3. All options would experience shorter HOV travel time in the westbound direction in the PM peak.

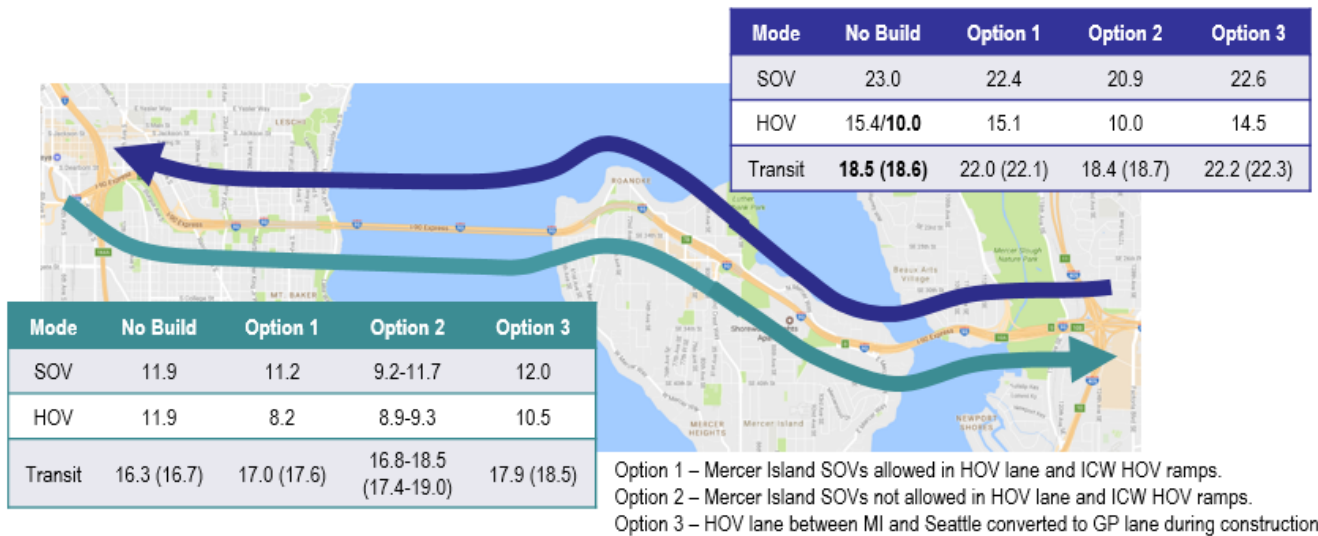


Exhibit 3-7. 2020 AM Peak Period Travel Times between Seattle and I-405

Notes:

Bold text represents travel times for vehicles in the I-90 center roadway. Values in parentheses represent transit travel times to/from the South Bellevue Park-and-Ride.

The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

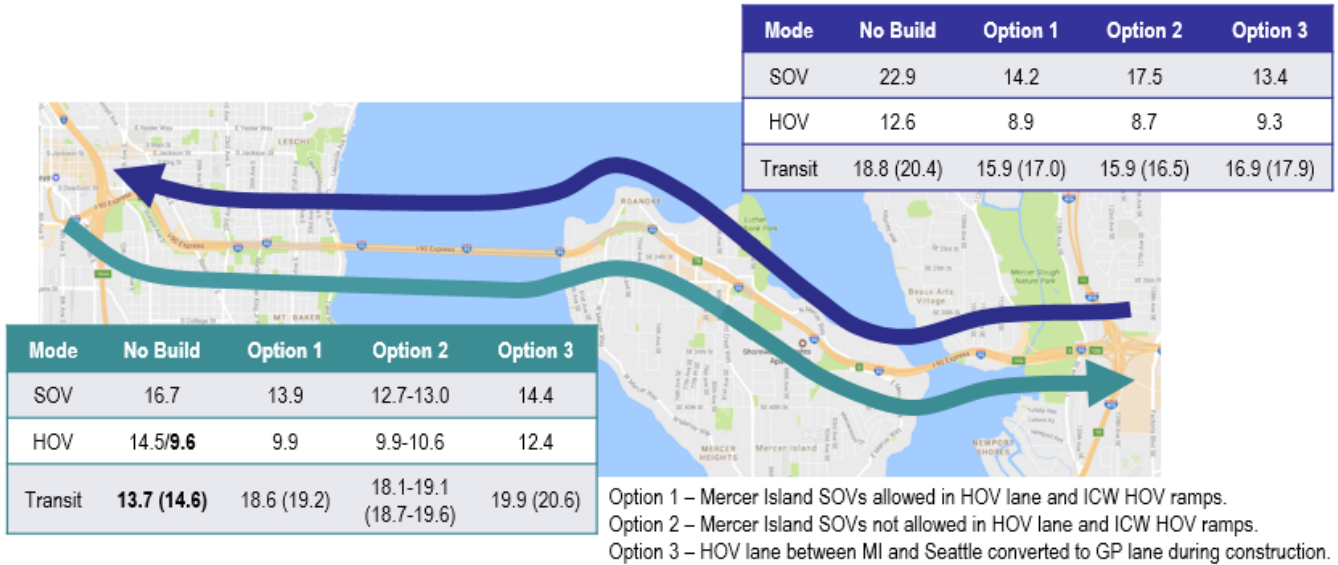


Exhibit 3-8. 2020 PM Peak Period Travel Times between Seattle and I-405

Notes:

Bold text represents travel times for vehicles in the I-90 center roadway. Values in parentheses represent transit travel times to/from the South Bellevue Park-and-Ride.

The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

Westbound transit travel times in the AM peak would be similar between Option 2 and the No Build condition and up to 4 minutes longer for Options 1 and 3. This is because Options 1 and 3 would have lower speeds in the HOV lane as more vehicles are allowed to use the lane. Eastbound transit travel time could be similar between the No Build condition and Options 1 and 2 in the AM peak, but about 2 minutes longer in Option 3 because the HOV lane is converted to a GP lane in this option. Transit travel times would be 4 to 6 minutes longer for all options in the eastbound direction in the PM peak, but would be 2 to 4 minutes shorter in the westbound direction with the new HOV lane.

LOS and Congestion

AM peak-period LOS and congestion on I-90 would be similar among the No Build condition and all options during construction for the westbound direction. In the eastbound direction, congestion approaching the Mount Baker Tunnel in Seattle would occur in the future with the No Build condition and all options. Both Option 1 and Option 3 would shift some congestion from the Mount Baker Tunnel area farther east at the East Channel Bridge and across Mercer Island. Congestion west of the tunnel could be higher with the No Build condition and Option 2 compared to Options 1 and 3. Congestion in Option 2 would be less at the Mount Baker Tunnel compared to the No Build condition and would have little to no congestion at the East Channel Bridge. This congestion at Mount Baker Tunnel would occur in the No Build condition where a fourth GP lane ends at the tunnel (and connects to the center roadway when operating in the eastbound direction) and in Option 2 where the fourth GP lane transitions to an HOV lane prior to the tunnel.

PM peak-period LOS and congestion on I-90 would be less for all options during construction in the westbound direction approaching the floating bridge than in the No Build condition. This is attributed

to the completion of the R-8A HOV lanes to Seattle. Option 2 would have more congestion than Options 1 and 3 in the westbound direction as more vehicles are using the GP lanes. In the eastbound direction, the options would be similar to or better than the No Build condition.

Options 1 and 3 would have similar congestion as the No Build condition, while Option 2 would have more congestion at the Mount Baker Tunnel than the No Build condition and Option 1. Option 2 could have less congestion at the Mount Baker Tunnel and more congestion at the East Channel Bridge, similar to Options 1 and 3.

The westbound HOV lane in Option 1 would operate at 45 mph or above for less than 60 percent of the time during the AM peak period and would not meet WSDOT's policy for operation of HOV lanes because of the higher volume of traffic with Mercer Island GP traffic using the lane. The eastbound lane would meet WSDOT's policy 100 percent of the time. With HOV-only use of the lanes in Option 2, the HOV lanes in both directions would meet this policy. In Option 3, the HOV lane would only extend between I-405 and Mercer Island, similar to the No Build condition.

WSDOT would consider actions to improve the HOV lane performance and the Island Crest Way westbound on-ramp operations. This would include metering the westbound Island Crest Way on-ramp at a rate that matches the HOV traffic volume, and consideration of other traffic control and enforcement strategies on the I-90 mainline and/or this ramp. These strategies would be required for Options 1 and 3, and they may also be implemented for Option 2, depending on the growth in HOV demand in the I-90 corridor. Adding these operational actions would increase vehicle queues on the Island Crest Way westbound on-ramp for Options 1 and 3, and drivers may shift to use other I-90 ramps, which would affect local travel times for those drivers similar to in Option 2. See Section 3.4.2 for local street operations in the future with the options.

Safety

The Final EIS determined that with East Link occupying the center roadway there would be no impact on the total number of crashes in the I-90 corridor as traffic in the center roadway, and associated crashes, shifts to the outer roadway. By 2020, it is likely that crashes in the No Build condition would increase over the existing crashes as volumes increase in the future. This follows the trend of the existing crash history.

With Option 2, the I-90 mainline would have slightly fewer crashes (2 crashes per year) compared to Option 1. The crash reduction is attributed to the changes in travel patterns to and from Mercer Island as drivers use different ramps between the options and slightly fewer vehicles travel on I-90 with Option 2 compared to Options 1 and 3. For example, in Option 2, fewer vehicles would travel westbound on I-90 between Island Crest Way and W Mercer Way with the westbound Island Crest Way on-ramp becoming HOV-only, and therefore the predicted number of crashes on I-90 mainline in this area would decrease. Option 3 would have 12 more predicted crashes per year than Option 1 and 14 more than Option 2 because of higher volumes primarily on the I-90 mainline.

The total number of crashes at the I-90 interchanges (ramps and ramp terminal intersections), would be similar for all options, even with the shift in Mercer Island local travel patterns associated with

Option 2. Crashes at the Island Crest Way I-90 interchange, which has the highest crash frequency on Mercer Island, would have 3 fewer crashes per year with Option 2 than with Options 1 and 3 because of the decreased volumes on the Island Crest Way HOV-only westbound on-ramp. It is predicted there would be 2 more crashes at the W Mercer Way and 1 more at the 76th Avenue SE interchanges with Option 2 than with Option 1 and Option 3, due to an increase in volumes, particularly on the westbound on-ramps. The geometry of the Island Crest Way westbound on-ramp with the R8-A project complete, in conjunction with higher volumes on this on-ramp with Options 1 and 3, would increase the potential for crashes at this location. Ramp metering and other operational actions previously described to address the westbound HOV lane and Island Crest Way westbound on-ramp operations would also improve safety at the Island Crest Way westbound on-ramp.

Overall, all of the I-90 facilities (mainline and interchanges) collectively are predicted to experience a reduction of 2 crashes per year with Option 2 over Option 1 and a reduction of 14 crashes per year over Option 3. When compared to the other options, Option 2 would have an overall reduction in crashes on the I-90 mainline of about 1 to 3 percent of the approximately 500 crashes per year on I-90 predicted in 2020. For all of the options, the majority of crashes (about 70 percent) are expected to be property damage only.

Safety analysis for construction of the new R-8A HOV lanes, including narrower lane and shoulder widths, was addressed in the Final EIS for the I-90 Two-Way Transit and HOV project (2004). That analysis addressed emergency recovery maneuvers, refuge for disabled vehicles, motorist assistance activities, emergency incident response highway maintenance activities, and traffic law enforcement. The R-8A Final EIS also acknowledged that the precedent exists for reduced lane and shoulder widths to implement HOV lanes on interstate highway facilities, noting that I-90 operated for several years in an interim condition that provided a westbound configuration with shoulder widths from 2 to 6 feet.

3.3.2.2 Operational Impacts

Vehicle and Person Throughput

Overall vehicle and person throughput would be similar between Option 1 and Option 2 but greater compared to the No Build condition. Table 3-8 shows the vehicle and person throughput for Screenlines A and B for the AM and PM peak periods, as well as the person throughput percent change from the No Build condition.

Both options would have a higher vehicle throughput in the reverse-peak directions (i.e., eastbound AM peak and westbound PM peak) compared with the No Build condition because the roadway capacity would be increased with new HOV lanes in combination with people adjusting their mode choice and riding light rail. People deciding not to drive and to ride light rail would cause a slight reduction in congestion and increase vehicle throughput. The vehicle throughput in the peak direction would be similar to slightly reduced compared with the No Build condition. Combined vehicle throughput in both I-90 directions would be lower in Option 2 compared to Option 1 at both screenlines.

With both options, the total person throughput on I-90 in 2035 would increase between 15 and 22 percent in the AM and PM peak periods compared with the No Build condition. With Option 2, total

person throughput at both screenlines would be similar to or slightly lower than Option 1. With Option 2, Mercer Island SOVs are not allowed in the HOV lane, which would increase person throughput in the HOV lane because less congestion occurs in the HOV lane but congestion increases slightly in the GP lanes.

Table 3-8. Vehicle and Person Throughput-2035 Operations

Throughput	Screenline A			Screenline B		
	No Build	Option 1	Option 2 ^a	No Build	Option 1	Option 2 ^a
AM Peak Period						
Vehicle	41,100	43,100	41,300-42,000	44,000	45,900	44,500-44,900
Person	65,900	77,700	76,100-76,900	67,900	79,700	78,400-78,900
Person Throughput Change from No Build	N/A	18%	15%-17%	N/A	18%	16%-16%
PM Peak Period						
Vehicle	42,000	46,500	44,000-44,600	45,900	51,200	48,600-48,900
Person	67,300	81,900	80,200-81,000	70,500	86,200	84,300-84,800
Person Throughput Change from No Build	N/A	22%	19%-20%	N/A	22%	20%

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and ICW HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and ICW HOV ramps

Option 3 - HOV lane between MI and Seattle converted to GP lane during construction

^a The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

Travel Times To and From Mercer Island

Table 3-9 provides the composite overall travel time for travel on I-90 to and from Mercer Island and Bellevue and Seattle during East Link operations. This travel time considers all directions of travel on I-90 to and from Mercer Island and is weighted by person for all modes. I-90 travel times for all modes to and from the island would be similar or improved between the No Build condition and the options. Most people from Mercer Island that travel on I-90 would experience a similar travel time with either option. For certain routes travel time would increase or decrease, but overall the changes offset each other. Attachment E, I-90 Person-Weighted Travel Times to and from Mercer Island, of Appendix A, Transportation Technical Report, provides detailed travel times from specific I-90 ramps on Mercer Island by mode, peak period, and analysis year.

Exhibits 3-9 and 3-10 show the travel times by mode for the AM and PM peaks to and from Mercer Island and Bellevue and Seattle in 2035. AM and PM peak-period person-weighted travel times for all modes to and from Mercer Island are expected to be similar to or better than the No Build condition with both options for most directions, with some exceptions. The following discussion further compares the options and the No Build condition.

Table 3-9. 2035 I-90 Person Travel Time Summary To and From Mercer Island between Seattle and Eastside (minutes)

Year 2035 Condition	AM Peak Period	PM Peak Period
No Build	7.5	6.7
Option 1	6.6	5.3
Option 2 ^a	7.1-7.8	6.4-6.6

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and ICW HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and ICW HOV ramps

Travel times are person-weighted based on all modes (SOV, HOV, and transit) and consider all ramps on Mercer Island.

^a The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

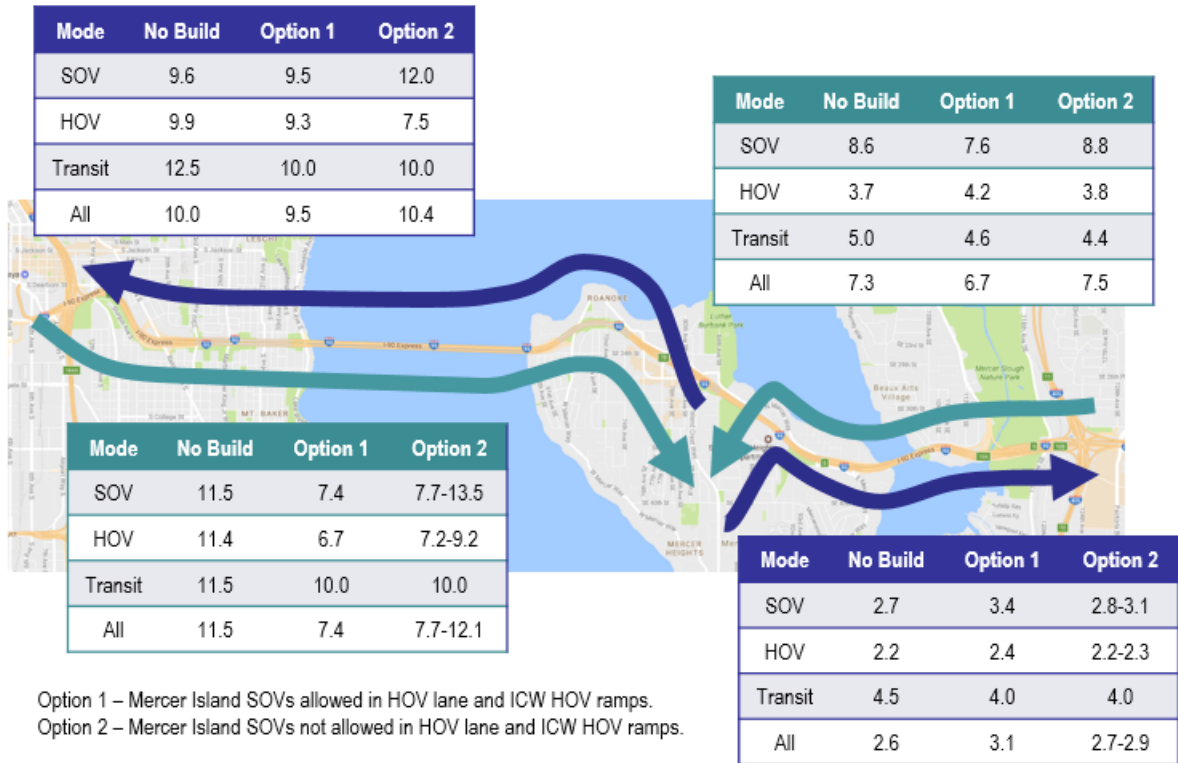


Exhibit 3-9. 2035 AM Peak Period Travel Times To/From Mercer Island

Note: The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

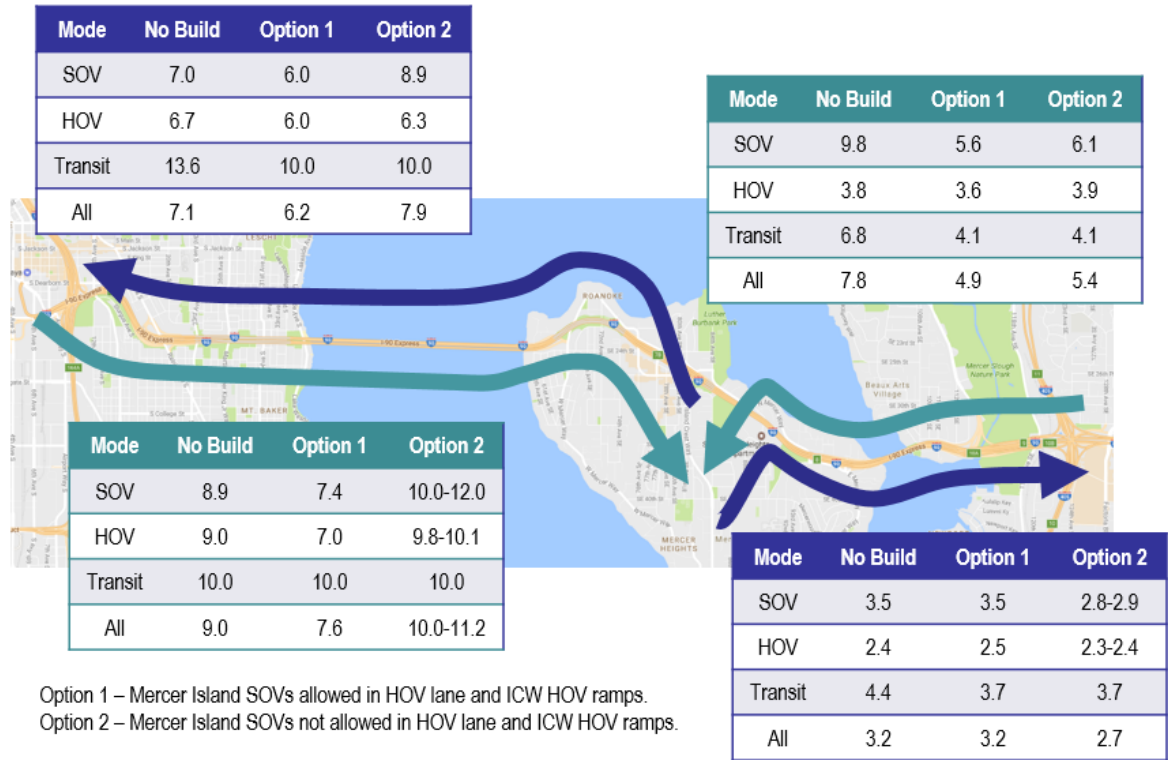


Exhibit 3-10. 2035 PM Peak Period Travel Times To/From Mercer Island

Note: The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

AM Peak Period

In the AM peak, westbound SOV travel times from Mercer Island to Seattle would be similar between the No Build condition and Option 1, but would be about 2.5 minutes longer in Option 2 because more SOVs use the GP lanes. Eastbound SOV trips from Seattle to Mercer Island would be up to 4 minutes shorter with either option than the No Build condition, with the high end of the Option 2 travel time range 2 minutes longer than the No Build condition. Travel times between Bellevue and Mercer Island would be similar (within a minute) between the options and the No Build condition.

HOV travel time in the AM peak westbound direction from Mercer Island to Seattle improves in both options compared to the No Build condition is about 2 minutes faster in Option 2 because fewer vehicles use the HOV lane. Westbound HOV travel time between Bellevue and Mercer Island would be the same between Option 2 and the No Build condition and about 0.5 minute shorter than Option 1. Eastbound HOV travel from Seattle to Mercer Island in the AM peak would be shorter with both options compared to the No Build condition.

Transit travel times in the AM peak period in all directions would be shorter with both options compared with the No Build condition because light rail would provide a shorter and more reliable travel time. Between Seattle and Mercer Island, transit travel times with either option would be about 2 minutes shorter than the No Build condition in both directions.

PM Peak Period

In the PM peak eastbound direction between Seattle and Mercer Island, Option 1 would have the shortest SOV travel time compared to the No Build condition and Option 2. Option 2 would have longer travel times than the No Build condition with an average travel time of between 10 to 12 minutes. Westbound SOV travel time in Option 2 from Mercer Island to Seattle would be 2 minutes longer than the No Build condition, and Option 1 would be 1 minute shorter than the No Build condition. SOV travel time in the westbound direction from Bellevue to Mercer Island would be up to 4 minutes shorter with both options compared to the No Build condition.

In the PM peak, HOV travel time would be improved in the westbound direction between Seattle and Mercer Island in both options compared to the No Build condition. In the eastbound direction between Seattle and Mercer Island, HOV travel times in Option 2 would be about 1 minute longer than the No Build condition. HOV travel between Mercer Island and Bellevue would be similar between both options and the No Build condition in both directions.

Transit travel times in the PM peak with both options would be similar to or faster than the No Build condition because light rail would provide a shorter and more reliable travel time. Eastbound transit travel times for both options would be the same as the No Build condition, but would be about 3.5 minutes faster in the westbound direction compared to the No Build condition. Transit travel times between Mercer Island and Bellevue could be 1 to 3 minutes faster in both options compared to the No Build condition.

Travel Times Between Seattle and Bellevue

Exhibits 3-11 and 3-12 show the travel times for the AM and PM peak periods between Bellevue and Seattle in 2035. Travel times for all modes between I-405 and Seattle would generally be similar or improve in both directions compared to the No Build condition during the both the AM and PM peak periods because of people riding light rail instead of driving and the additional capacity provided with the outer roadway HOV lanes.

SOV travel times in the AM peak would be improved with both options compared to the No Build condition in the westbound direction. In the eastbound direction, SOV travel time with both options could increase by about 1 minute compared to the No Build condition.

However, Option 2 could see shorter travel time for SOVs eastbound by about 1.5 minutes compared to the No Build condition. In the PM peak, SOV travel time in both directions would see substantial improvement of between 3 and 9 minutes with both options compared to the No Build condition. Westbound SOV travel times in Option 1 would be about 3.5 minutes shorter than Option 2.

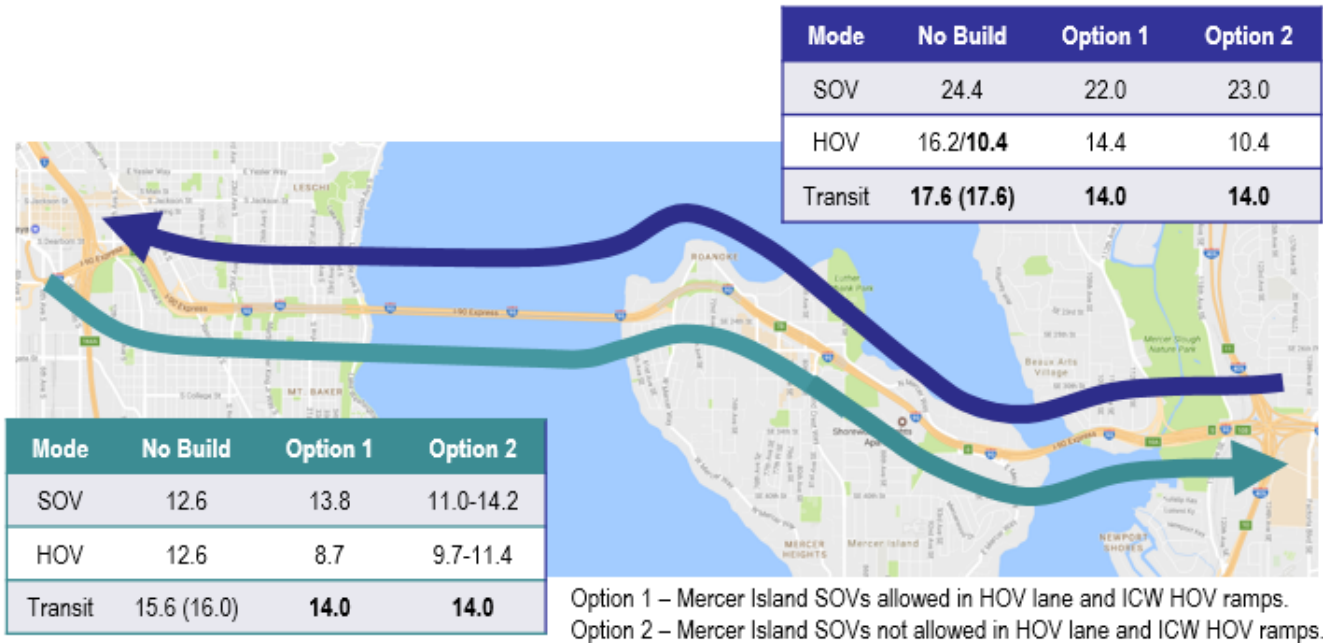


Exhibit 3-11. 2035 AM Peak Period Travel Times between Seattle and I-405

Notes:

Bold text represents travel times for vehicles in the I-90 center roadway. Values in parentheses represent transit travel times to/from the South Bellevue Park-and-Ride.

The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

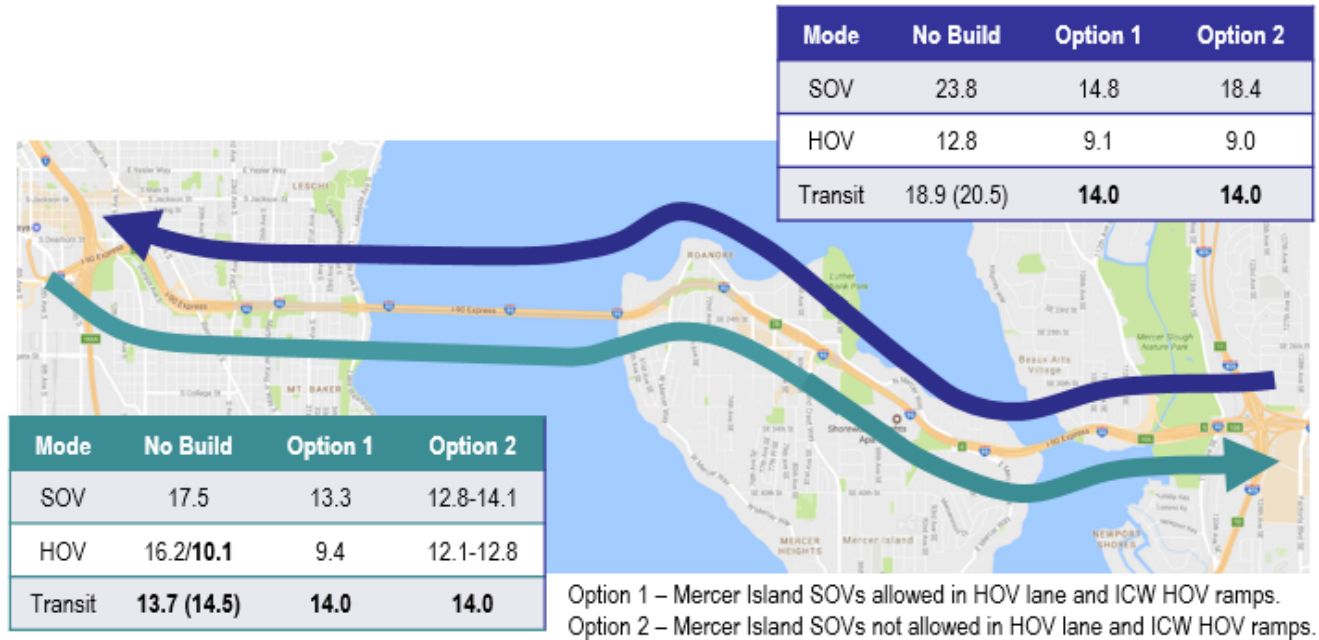


Exhibit 3-12. 2035 PM Peak Period Travel Times between Seattle and I-405

Notes:

Bold text represents travel times for vehicles in the I-90 center roadway. Values in parentheses represent transit travel times to/from the South Bellevue Park-and-Ride.

The Option 2 range of results depends on whether WSDOT determines it is appropriate in the future to modify the eastbound HOV lane transition at the Mount Baker Tunnel in Seattle.

Westbound HOV travel time in the AM peak in Option 2 would be similar to the No Build condition because the HOV lane is only available for HOV and transit. In Option 1, the HOV travel times would be 4 minutes longer when compared to an HOV using the center roadway in the No Build condition and Option 2. Eastbound HOV travel times in the AM peak would be faster for both options compared to the No Build condition, with Option 2 having longer travel time than Option 1. HOV travel time in the PM peak eastbound direction would be shorter for Option 1 compared to the No Build condition, with Option 2 taking up to 2 minutes longer than an HOV in the No Build condition using the center roadway. Both options would improve HOV travel time in the westbound direction in the PM peak by over 3 minutes compared to the No Build condition due to the new HOV lane.

Transit travel times between Seattle and Bellevue would generally improve in both the AM and PM peak periods because light rail would take 14 minutes to travel between the International District Station and South Bellevue Station. Westbound in the AM peak, transit travel times would be up to 3.5 minutes shorter with the options and almost 2 minutes shorter in the eastbound direction compared to the No Build condition. In the PM peak, the transit travel time in the peak eastbound direction would be similar to the No Build condition, while the westbound direction would see a savings of up to 6 minutes.

LOS and Congestion

AM peak-period LOS and congestion on I-90 would be similar between the No Build condition and both options in the westbound direction for the GP lanes. The HOV lanes would, in general, operate with less congestion than the GP lanes, but in the westbound AM peak, the HOV lane would experience heavier congestion with Option 1 compared to Option 2 due to SOVs from Mercer Island traveling in the lane. In the eastbound direction, as slightly higher vehicle throughput occurs in Option 1, congestion that occurs at the Mount Baker Tunnel in the No Build condition would shift to the East Channel Bridge. With this congestion extending across Mercer Island, it would be less than the No Build condition congestion at the Mount Baker Tunnel. As described for construction, congestion west of the tunnel could be higher with the No Build condition and Option 2, although Option 2 would be less than the No Build condition. The traffic congestion in this area will be monitored by WSDOT to determine if conditions warrant further analysis of potential modifications to the HOV lane transition to improve operations between I-5 and the Mount Baker Tunnel, which may result in shifting congestion farther east to the East Channel Bridge similar to Option 1.

PM peak-period congestion in the I-90 GP lanes would be less for both options in the westbound direction than in the No Build condition, although Option 2 would have more congestion than Option 1. The westbound HOV lane would similar congestion in both options. In the eastbound direction, both options would be better than the No Build condition. Option 1 would have congestion for a shorter duration than the No Build condition, while Option 2 would have more congestion at the Mount Baker Tunnel and less to the east of the tunnel.

Similar to the construction condition, the westbound HOV lane in Option 1 during operations would not meet the WSDOT policy for operation of HOV lanes, while the eastbound HOV lane would meet this policy 100 percent of the time in both peak periods. With Option 2, the HOV lanes in both

directions would meet this policy during both AM and PM peak periods. WSDOT would meter the Island Crest Way westbound on-ramp for both Options 1 and 2 and consider other actions to improve the HOV lane performance and the on-ramp operations for Option 1. Adding these operational actions would increase vehicle queues on the Island Crest Way westbound on-ramp for Option 1 and drivers may shift to use other I-90 ramps, which would affect local travel times for those drivers similar to Option 2. See Section 3.4.2 for local street operations in the future with the options.

Safety

The Final EIS determined that, with East Link occupying the center roadway, the total number of crashes in the I-90 corridor would be similar as traffic in the center roadway, and associated crashes, shifts to the outer roadway. This crash analysis was conducted to compare vehicle crashes on I-90 between Options 1 and 2 and does not include the safety benefit of travel by light rail. The Final EIS included a safety performance measure by person, which included light rail ridership, and both Options 1 and 2 would have substantially fewer crashes by person compared to the No Build condition as riders on light rail would be traveling in a safer mode than traffic that currently uses the center roadway. By 2035, it is likely that crashes would increase in the No Build condition over the existing crashes on I-90, as volumes increase in the future.

On the I-90 mainline, Option 2 would have 7 fewer crashes per year compared to Option 1. The crash reduction is attributed to the changes in travel patterns to and from Mercer Island as drivers use different ramps between the options and slightly fewer vehicles traveling on I-90 with Option 2 compared to Option 1. For example, in Option 2, fewer vehicles would travel westbound on I-90 between Island Crest Way and W Mercer Way with the westbound Island Crest Way ramp becoming HOV-only, and therefore the expected number of crashes on I-90 mainline in this area would decrease.

At the I-90 interchanges (ramps and ramp terminal intersections), the total number of crashes would be similar overall between the options with the local travel pattern shifts on Mercer Island. At the Island Crest Way interchange, it is predicted there would be 3 fewer crashes per year with Option 2 than Option 1 because of the decreased volumes on the Island Crest Way HOV-only westbound on-ramp. It is predicted there would be an increase of 2 crashes per year at the W Mercer Way interchange and 1 crash per year at the 76th Avenue interchange with Option 2 compared to Option 1 due to an increase in volumes, particularly on the westbound on-ramps.

Ramp metering and other operational actions previously described to address the westbound HOV lane and Island Crest Way westbound on-ramp operations would also improve safety at the Island Crest Way westbound on-ramp. The geometry of the Island Crest Way westbound on-ramp with the R8-A project in conjunction with higher volumes on this on-ramp with Option 1 would increase the potential for crashes at this location. Ramp metering and other operational actions previously described to address the westbound HOV lane and Island Crest Way westbound on-ramp operations would also improve safety at the Island Crest Way westbound on-ramp.

Overall, the I-90 facilities (mainline and interchanges) collectively are predicted to experience a reduction of 7 crashes per year (less than 2 percent) with Option 2 over Option 1, which is a reduction

of about 1 percent in the 500 crashes per year on I-90 predicted in 2035. For both of the options, the majority of crashes (about 70 percent) are expected to be property damage only.

Refer to Section 3.3.2.1 for a discussion of the safety analysis of the R-8A HOV lanes, which was addressed in the Final EIS for the I-90 Two-Way Transit and HOV project (2004).

3.3.3 Mitigation

During East Link construction, as described in the Final EIS, Sound Transit would coordinate with WSDOT on incident management, construction staging, and traffic control where light rail construction might affect freeway traffic. Sound Transit would also coordinate with WSDOT to disseminate construction closure information to the public as needed.

Vehicle and person throughput would increase across Lake Washington in both the AM and PM peak periods compared with the No Build condition in both construction and operation conditions and therefore no mitigation is needed.

No mitigation related to travel time would be necessary along the I-90 mainline during East Link construction and operation because overall I-90 composite travel time for all modes to and from Mercer Island and regionally between Seattle and Bellevue would be similar or improved between the No Build condition and the options. Congestion on the I-90 mainline in either direction during the AM and PM peak periods would be similar or improved with Option 2 and the other options compared to the No Build condition, and therefore no mitigation is needed. For Option 1, ramp metering at the Island Crest Way westbound on-ramp and other WSDOT operational actions on this ramp and/or the westbound HOV lane would improve HOV lane performance.

Regarding safety, all of the options have a similar predicted number of crashes relative to total annual crashes on I-90, with Option 2 the fewest. All options in 2035, with light rail, would have a similar vehicle crash rate in the I-90 corridor as without the project and would have substantially fewer crashes per person because light rail riders travel in a safer mode than vehicles; therefore, no safety mitigation is required. Operational actions to address the westbound HOV lane and Island Crest Way westbound on-ramp operations would also improve safety performance at the on-ramp.

3.3.4 Comparison to Final EIS

Consistent with the Final EIS, the construction and operations options would increase vehicle and person throughput.

Specific travel time values may be different between the Final EIS and this Addendum because this analysis utilized more recent data and information and the methodologies were updated as explained in Appendix A. Therefore, results cannot be compared directly to the Final EIS, but trends can be compared. Comparing travel times, most modes between Seattle and Bellevue are similar or improve their travel time with the options compared to the No Build condition. This is consistent with the Final EIS. Between Mercer Island and Seattle, travel times for SOVs from Mercer Island to Seattle increased in the AM peak and in both directions in the PM peak in the Final EIS with the project compared to the similar No Build condition. This is generally consistent with the analysis in this Addendum. The Final EIS did not include travel times between Mercer Island and Bellevue.

Congestion on I-90 with the options would be less than compared to the No Build condition and would occur over a shorter distance compared to the Final EIS in the AM peak period. During the PM peak period, congestion on I-90 would also be less, especially in the westbound direction, but more dispersed across I-90 compared to the Final EIS. The trends in congestion between the No Build condition and the options are similar to the Final EIS, although the forecasted patterns of congestion are somewhat different because the analysis in this document was updated based on more recent data and on forecast information provided by PSRC.

Impacts from the change in I-90 Operations are within the range of alternatives, potential impacts, and mitigation evaluated in the Final EIS.

3.4 Arterials and Local Streets¹

This section describes the proposed changes in traffic circulation on Mercer Island related to Options 1, 2, and 3, as well as from the Transit Integration configurations. Impacts to intersection level-of-service are described for Seattle, Mercer Island, and Bellevue, as well as travel times on Mercer Island. Potential changes in safety for local roads in these jurisdictions are also provided.

3.4.1 Affected Environment

Key roadways on Mercer Island potentially affected by the options are described and analyzed for existing conditions within this section.

Island Crest Way is the only Principal Arterial on Mercer Island. It has this designation between SE 40th Street and I-90, and has 2 lanes in each direction and a speed limit of 35 mph. South of SE 40th Street and crossing I-90, Island Crest Way is designated as a secondary arterial and has 1 to 2 lanes in each direction with turn pockets where needed and a speed limit of 35 mph. In the Town Center, SE 27th Street, SE 32nd Street, 77th Avenue SE and 80th Avenue SE are also listed as secondary arterials and have one lane in each direction. N Mercer Way, SE 28th Street, SE 30th Street, 76th Avenue SE and 78th Avenue SE are classified as collector arterials and have one lane in each direction with turn pockets where needed. All streets in the Town Center have a speed limit of 25 mph except N Mercer Way, which is 30 mph. SE 40th Street and W Mercer Way are classified as secondary arterials with one lane in each direction. SE 40th Street is 30 mph

Roadway Classifications

The definitions below are from the Mercer Island Comprehensive Plan (2016).

Principal arterials carry the highest volumes of traffic and provide the best mobility in the roadway network.

Secondary arterials connect with and augment principal arterials and generally have a higher degree of access to adjacent land, lower traffic volumes and lower travel speeds.

Collector arterials provide for movement within neighborhoods, connecting to secondary and principal arterials; and typically have low traffic volumes and carry little through traffic.

Local streets provide for direct access to abutting properties and carry low volumes of traffic at low travel speeds. Local streets are usually not intended for through traffic.

¹ The City of Mercer Island prepared an analysis of local street impacts on Mercer Island with the westbound Island Crest Way ramp operating as HOV-only. Sound Transit has reviewed the City's report and considered it in this analysis.

between Island Crest Way and 78th Avenue SE, and is 25 mph west of 78th Avenue SE. W Mercer Way varies between 25 and 30 mph. School zones are 20 mph when children are present.

Intersection analysis was conducted for 11 intersections in Seattle, 25 intersections on Mercer Island, and 3 intersections in Bellevue (Exhibit 3-13). Existing conditions were analyzed for both the AM and PM peak-hours. Seven of the intersections in Seattle and 11 on Mercer Island are within WSDOT jurisdiction because the intersection is at or adjacent to an I-90 or I-5 ramp. The intersection analysis was compared with the relevant jurisdiction's adopted LOS standard to gauge whether the intersection operates at an acceptable LOS.

The relevant agencies and their LOS standards are:

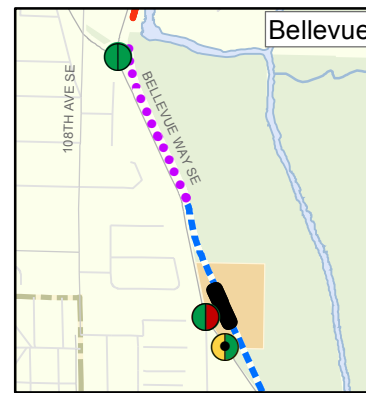
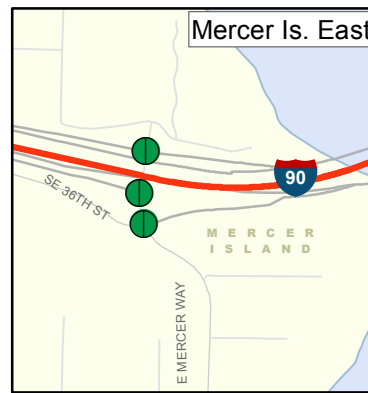
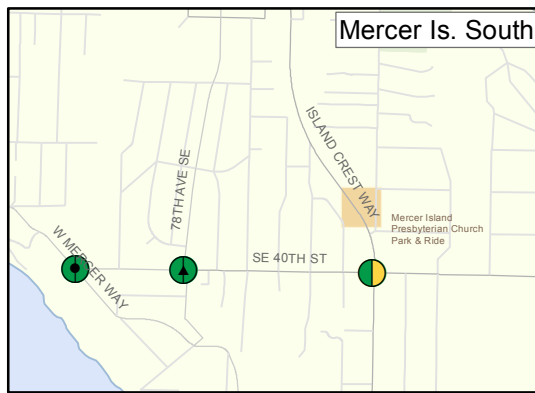
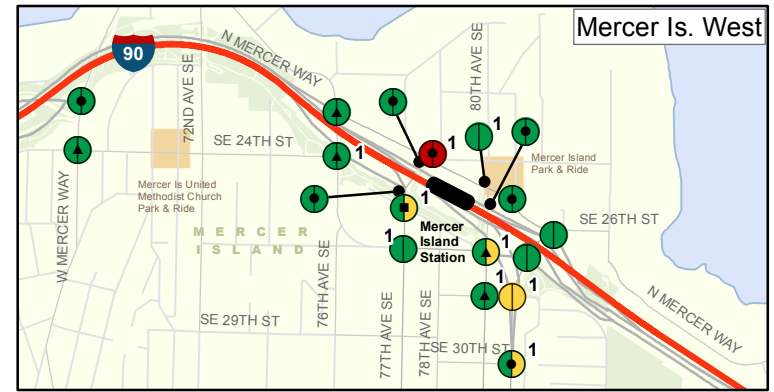
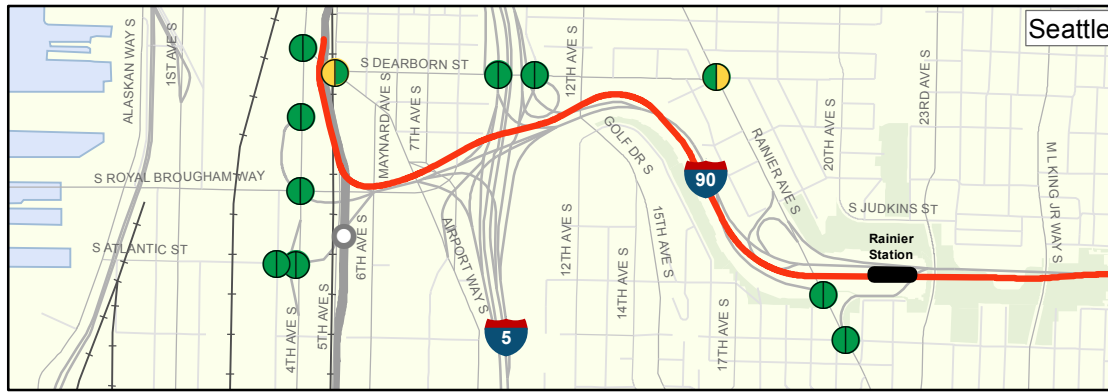
- WSDOT: LOS D
- City of Seattle: LOS D
- City of Mercer Island (Town Center): LOS C
- City of Mercer Island (Outside Town Center): LOS D
- City of Bellevue: LOS D

In the existing AM and PM peak hours, the intersection of 77th Avenue SE and N Mercer Way does not meet agency standards due to long vehicle delays on the northbound stop-controlled approach (City of Mercer Island, Town Center, LOS C). In the PM peak hour, the South Bellevue Park-and-Ride intersection with Bellevue Way SE also does not meet the standard due to high traffic volumes in the southbound direction (City of Bellevue, LOS D). All other intersections meet LOS standards. AM and PM peak-hour intersection LOS results are included in Appendix A, Transportation Technical Report.

In addition to intersection LOS, vehicle travel times on local Mercer Island streets were calculated within the areas depicted in Exhibit 3-14. The travel times are summarized for all trips using the I-90 ramps to and from the island. While many trips using the ramps come from or go to areas beyond the shaded areas, the bounded area is considered the area of influence associated with any travel pattern shifts between the options. On average, a trip within this local area currently takes between 1.0 and 1.6 minutes to travel to an I-90 ramp or come from an I-90 ramp with the longest travel time being just over 3 minutes.

3.4.1.1 Traffic Safety

Crash data were collected from WSDOT for the most recent 5 years (2011 through 2015) at the study area intersections and key streets within the Mercer Island local study area. The results discussed in this section exclude the intersections at ramp terminals, which are included in Section 3.3, Highway Operations and Safety. Crash data includes all crash types, including collisions with pedestrians or bicycles.



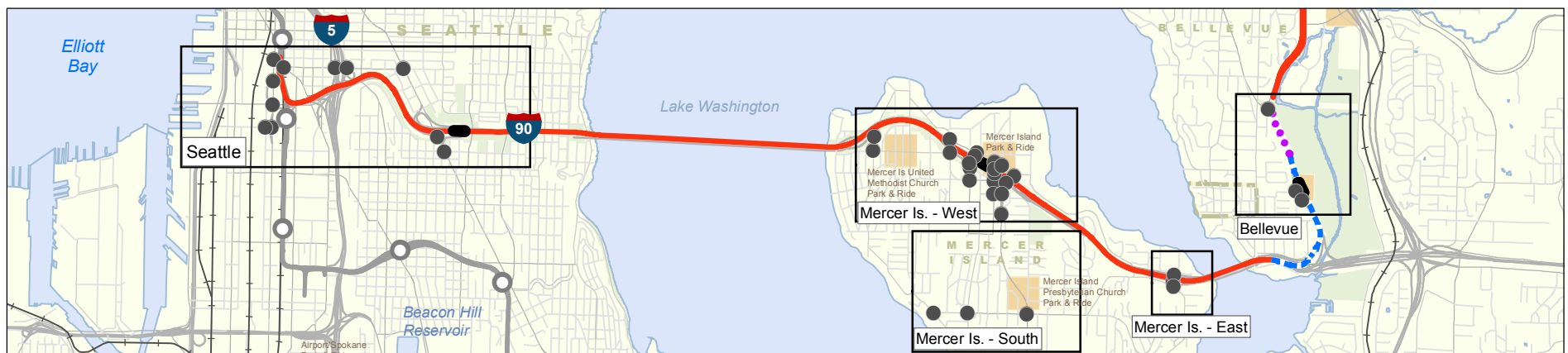
Existing Level of Service (LOS)

WSDOT, Seattle, Mercer Island, Bellevue	Mercer Island Town Center
● A - C	● ¹ A - B
● D	● ¹ C
● E - F	● ¹ D - F

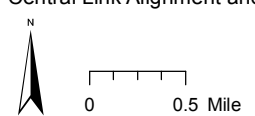
LOS Key for Options

AM LOS - ● - PM LOS

NOTES: The level of service in yellow is the jurisdiction's standard for intersections in this segment.
 1 - Intersection within Mercer Island Town Center jurisdiction.



- ⊙ Signalized
- ⊙ Two-Way Stop Controlled
- ⊙ One-Way Stop Controlled
- ⊙ All-Way Stop Controlled
- ⊙ Central Link Alignment and Station
- ⊙ At-Grade Route
- ⊙ Elevated Route
- ⊙ Retained-Cut Route
- ⊙ Tunnel Route
- ⊙ Proposed Station



Source: Data from King County (2006) and modified by CH2M. Updated by CH2M 2017.

Exhibit 3-13 Existing AM and PM Level of Service at Intersections East Link Project

The intersection of Rainier Avenue S and S Massachusetts Street in Seattle recorded 50 crashes, the highest of all study intersections. Sixty percent of these crashes resulted in property damage. Also in Seattle, the intersections of Rainier Avenue at Dearborn Street and 4th Avenue S at S Royal Brougham Way each had the next highest crash frequency within the study area at 45 and 29, respectively.

On Mercer Island, the safety analysis included crashes on the streets shown in the text box in addition to key intersections along these roads. For all of these facilities, there were a total of 152 crashes over the 5 years of data. Along W Mercer Way between SE 40th and I-90, there were a total of 12 crashes. N Mercer Way had 10 crashes and SE 40th Street had 2 crashes. Island Crest Way had 7 crashes. Intersections on Mercer Island generally experienced an average of fewer than 2 crashes per year. Exceptions include 80th Avenue at SE 27th Street, which recorded 14 total crashes, and Island Crest Way at SE 40th Street, which had 19 total crashes over the 5 years of data. Overall, over 60 percent of the existing crashes that occurred on Mercer Island in the study area were property damage only crashes.

In Bellevue, the intersection of Bellevue Way SE and 112th Avenue SE experienced a total of 19 crashes over the 5 years. No crashes occurred at any of the South Bellevue Park-and-Ride north and south driveways.

3.4.1.2 Parking

Public parking supply and demand were inventoried within $\frac{1}{4}$ mile of the Mercer Island light rail station in an area generally bound by SE 22nd Street to the north, SE 29th Street to the south, 76th Avenue SE to the west, and 84th Avenue SE to the east. Sound Transit owns and maintains the Mercer Island Park-and-Ride on N Mercer Way, east of 77th Avenue SE. The Mercer Island Park-and-Ride has approximately 450 parking spaces, with a utilization rate of 100 percent on weekdays (King County Metro, 2016b). Parking surveys found it is typically full by 7:30 a.m.

On Mercer Island, King County Metro leases four park-and-ride lots that provide approximately 100 additional parking spaces, all of which are more than $\frac{1}{4}$ mile from the Mercer Island Station. Bus service connects these leased lots with the Mercer Island Park-and-Ride. The leased lots have a utilization rate of 50 percent on a typical weekday (King County Metro, 2016b).

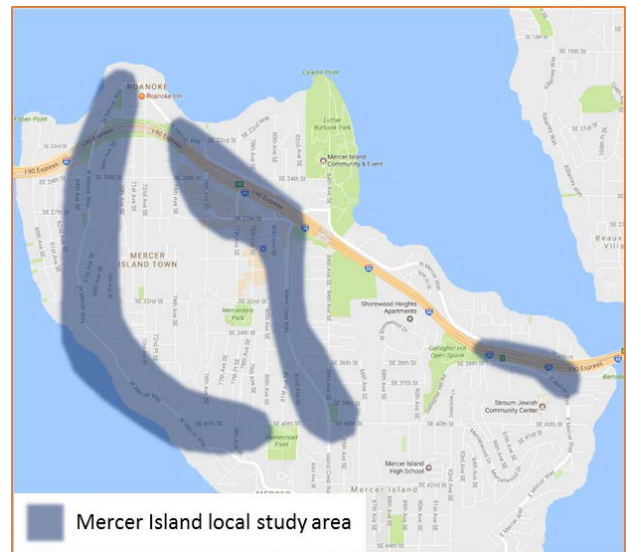


Exhibit 3-14. Mercer Island Local Travel Time Study Area

Mercer Island Street Safety Analysis

The safety analysis on Mercer Island was conducted to identify changes in the future conditions associated with the options. Streets include: W Mercer Way, Island Crest Way, N Mercer Way, SE 27th Street, 76th Avenue SE, SE 24th Street, 77th Avenue SE, 78th Avenue SE, 80th Avenue SE, SE 30th Street, SE 36th Street, SE 40th Street, and E Mercer Way.

Within ¼ mile of the station there are only a few on-street unrestricted parking areas. Unrestricted on-street parking spaces are provided on the north end of 76th Avenue SE between SE 27th Street and the adjacent property driveway. Over 50 percent of these spaces (11 of 23) were occupied in the AM peak period.

The rest of the on-street parking within the Town Center is either time-restricted or permit only and is provided in three separate areas within ¼ mile of the station. These permit-only areas allow Mercer Island residents to park on-street during the restricted timeframe (Monday through Friday, 7:00 a.m. to 9:00 a.m.). The areas and their parking utilization rates are:

- West end of Sunset Highway SE (cul-de-sac): 60 percent utilized (9 of 15 spaces occupied)
- 78th Avenue SE, between SE 28th Street and SE 29th Street: 90 percent utilized (9 of 10 spaces occupied)
- 80th Avenue SE, between SE 28th Street and SE 30th Street: 82 percent utilized (27 of 33 spaces occupied)

The Mercer Island Town Center contains numerous private off-street parking garages, and cost and validation policies vary among property owners. Regulations for private parking are enforced by property owners at their discretion. The residential neighborhoods north of I-90, surrounding the Mercer Island Park-and-Ride lot, have restricted parking designated as residential parking zones.

The I-90 Operational options and Transit refinements do not have the potential to affect parking at the Judkins Park or South Bellevue stations, so parking was not assessed for these locations.

3.4.2 Environmental Impacts

This section analyzes the potential impacts of the No Build condition and the I-90 Operation options during construction (2020) and operations (2035) on the local and arterial street system operations, safety, and parking based on the future travel demand forecasts and vehicle trips generated at the Judkins Park, Mercer Island, and South Bellevue stations.

Closure of the center roadway for East Link construction and operations would require the closure of some ramps and would change how drivers currently access and exit I-90 on Mercer Island. Table 3-10 illustrates how Mercer Island access will change with the closure of the center roadway and which ramps are designated for GP or HOV access. As shown in the table, the total number of ramps on Mercer Island would be reduced from 16 in the No Build condition to 15 with all options, regardless of how the HOV lanes are operated. This is due to the closure of the 77th Avenue SE and Island Crest Way reversible center roadway ramps with East Link in conjunction with the new eastbound HOV off-ramp to Island Crest Way as part of the R-8A HOV project.

With Options 1 and 3, at any one time, there would be 13 ramps open to GP traffic and 2 ramps for HOV and transit use only. With Option 2, there would be 11 ramps open to GP traffic and 4 ramps for HOV and transit use only. The difference between the options is the change in vehicle eligibility with the Island Crest Way on- and off-ramps to and from the R-8A HOV lanes.

Table 3-10. Changes in I-90 Ramps on Mercer Island

Mercer Island Ramp	No Build		Options 1 and 3 (Construction and Operations)		Option 2 (Construction and Operations)	
	AM	PM	AM	PM	AM	PM
<i>Westbound On-ramps</i>	6 GP	4 GP	4 GP	4 GP	3 GP/1 HOV	3 GP/1 HOV
E Mercer Way	X	X	X	X	X	X
N Mercer Way/76th Avenue SE	X	X	X	X	X	X
77th Avenue SE (Center)	X					
Island Crest Way (Center)	X					
Island Crest Way (Outer)	X	X	X	X	x (HOV)	x (HOV)
W Mercer Way	X	X	X	X	X	X
<i>Westbound Off-ramps</i>	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV
Island Crest Way	X	X	X	X	X	X
E Mercer Way	X	X	X	X	X	X
80th Avenue SE	x (HOV)	x (HOV)	x (HOV)	x (HOV)	x (HOV)	x (HOV)
<i>Eastbound On-ramps</i>	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV	2 GP/1 HOV
Island Crest Way	X	X	X	X	X	X
E Mercer Way	X	X	X	X	X	X
80th Avenue SE	x (HOV)	x (HOV)	x (HOV)	x (HOV)	x (HOV)	x (HOV)
<i>Eastbound Off-ramps</i>	4 GP	6 GP	5 GP	5 GP	4 GP/1 HOV	4 GP/1 HOV
W Mercer Way	X	X	X	X	X	X
77th Avenue SE (Outer)	X	X	X	X	X	X
77th Avenue SE (Center)		X				
Island Crest Way (Outer)	X	X	X	X	X	X
Island Crest Way (Center)		X				
Island Crest Way (HOV)			X	X	X (HOV)	X (HOV)
E Mercer Way	X	X	X	X	X	X
Total GP Ramps	14	14	13	13	11	11
Total HOV Ramps	2	2	2	2	4	4
Total Ramps	16	16	15	15	15	15

With these ramps designated for HOV and transit use in Option 2, SOVs to and from Mercer Island will redistribute to the remaining ramps at W Mercer Way, 76th Avenue SE, 77th Avenue SE, Island Crest Way, and E Mercer Way. Among the options, the changes in travel patterns are associated with what

vehicles are able to use the Island Crest Way ramps. Exhibits 3-15 and 3-16 illustrate how trips to and from Mercer Island are expected to be redistributed in the AM and PM to and from the west on I-90.

In addition to these changes, WSDOT is modifying the HOV bypass lane on the W Mercer Way westbound on-ramp to I-90 to operate as an HOV metered lane, and, when necessary, allowing the ramp to operate as two GP metered lanes. WSDOT is modifying the ramp control to uniformly regulate entrance traffic onto I-90, including non-HOVs that are using the bypass to avoid stopping at the meter. The change will also provide operational flexibility to ensure that metered traffic does not affect the operation of the adjacent local streets.

Changes in roadway operation associated with the Transit Integration configurations were included in this analysis, but there were no changes in intersection operations, parking, or safety between configurations during operations. Some differences would occur during construction and are described in Section 3.4.2.1.

3.4.2.1 Construction Impacts

Traffic Forecasts and Trip Distribution

For 2020, the overall arterials' and local streets' traffic forecasts in the No Build condition are expected to grow at an average annual rate of just under 1 percent in both the AM and PM peaks. Forecasts during light rail construction include the potential changes in local travel patterns that would occur for trips to and from I-90 compared to the No Build condition, as shown in Exhibits 3-15 and 3-16.

In the AM peak for all of the options, the closure of the I-90 center roadway and associated ramps would result in drivers changing their route and using the I-90 westbound on-ramps at Island Crest Way, 76th Avenue SE, W Mercer Way, and E Mercer Way. This distribution of future vehicle trips was based on existing travel times to and from these ramps as well as afternoon and evening travel patterns when drivers are already currently adjusting their travel patterns for when the center roadway is unavailable in the westbound direction. Because Options 1 and 3 both allow Mercer Island SOVs access to the Island Crest Way westbound on-ramp, they would be expected to have similar local travel patterns on the island as today. With Option 2, SOVs would shift from the Island Crest Way westbound on-ramp to the 76th Avenue SE and W Mercer Way on-ramps (Exhibit 3-15). To access these on-ramps, drivers would likely travel on W Mercer Way, N Mercer Way, SE 24th Street, and 76th Avenue SE, among other streets, depending on where they are coming from. In addition, with the I-90 HOV lanes in Option 2 only allowing HOV and transit, some HOVs on Mercer Island would shift from using other I-90 ramps to the Island Crest Way westbound HOV on-ramp. In the AM peak hour with Option 2, the Island Crest Way westbound on-ramp would decrease by approximately 400 vehicles per hour (vph) while the W Mercer Way and 76th Avenue SE westbound on-ramps would each increase by about 200 vph compared to Options 1 and 3.

In the PM peak with any of the options, trips that use the center roadway eastbound off-ramp at 77th Avenue SE in the No Build condition would use one of the outer roadway eastbound off-ramps at W Mercer Way, 77th Avenue SE, or Island Crest Way. With the new eastbound HOV and existing GP off-ramps to Island Crest Way, most eastbound traffic that used the center roadway off-ramp to Island

Crest Way in the No Build condition would continue to use Island Crest Way with minimal redistribution to other local streets (Exhibit 3-16).

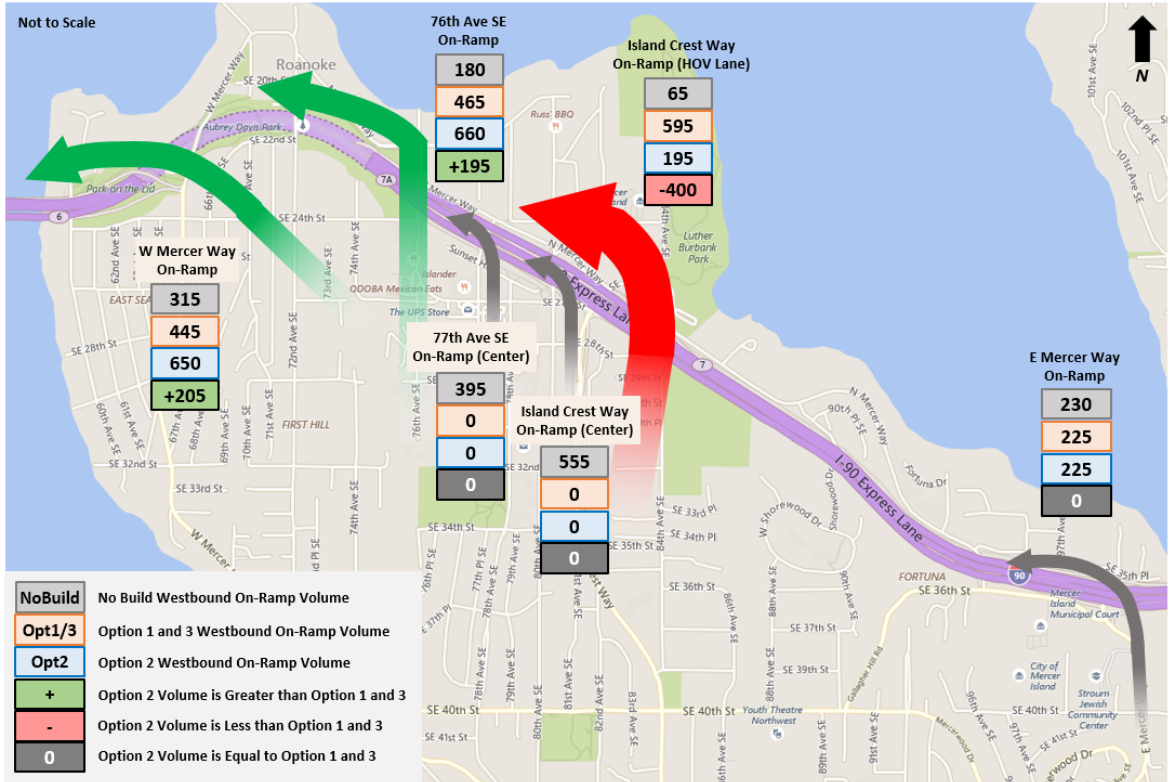


Exhibit 3-15. 2020 AM Westbound Travel Patterns from Mercer Island

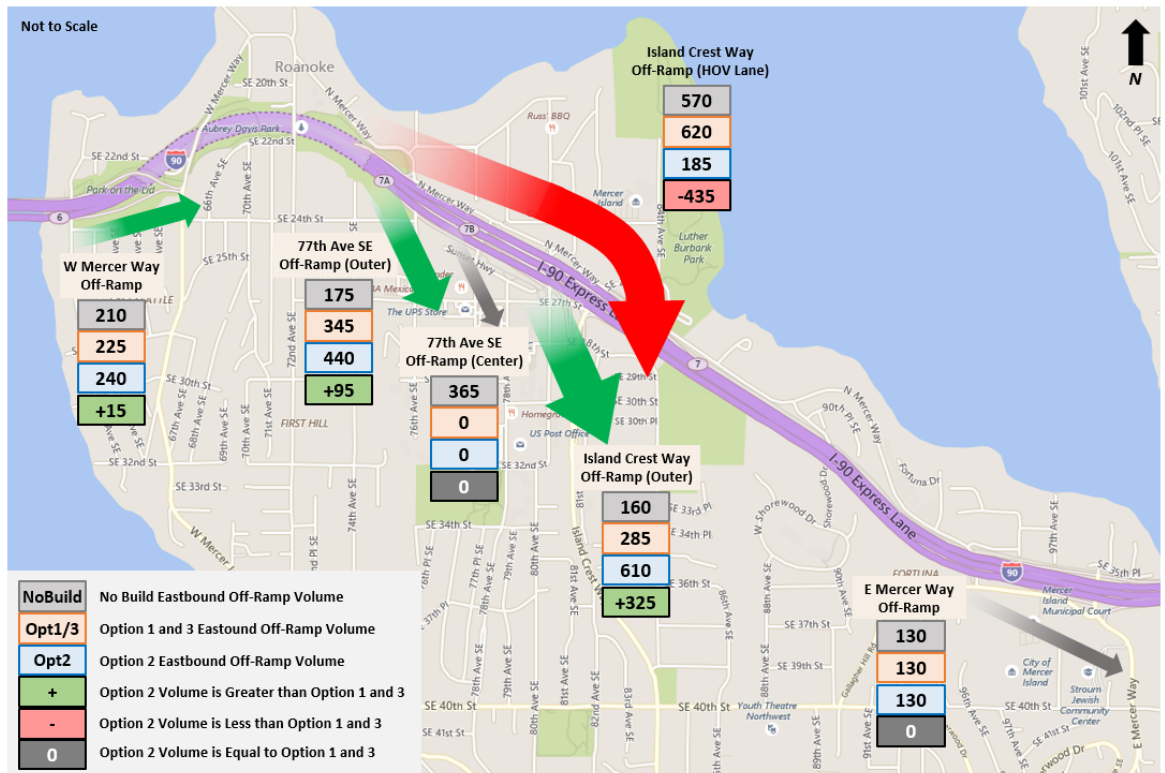


Exhibit 3-16. 2020 PM Eastbound Travel Patterns to Mercer Island

With Option 2 (SOVs prohibited), there would be a shift of about 3,700 daily SOV trips (about 5 percent of total daily trips using I-90 ramps to and from Mercer Island) on the Island Crest Way westbound on-ramp, although the traffic volume on this ramp would only decrease by about 2,700 because about 1,000 daily HOV trips (about 1.5 percent of daily trips using I-90 ramps to and from Mercer Island) would shift their travel pattern on the island and use Island Crest Way westbound to take advantage of the I-90 HOV lanes when designated for HOV and transit only. Overall, with Option 2 there would be a net decrease of about 2,700 vehicles per day at the Island Crest Way westbound ramp compared to Options 1 and 3, with a corresponding combined net increase of 2,700 vehicles per day at the W Mercer Way and 76th Avenue SE on-ramps. Over 70,000 total vehicles per day would travel to and from Mercer Island in the future. Therefore this net change in volume accounts for about 4 percent of all trips using I-90 ramps on Mercer Island during a day.

Temporary Road Closures

Either of the Transit Integration configurations could require temporary road closures; the 77th Avenue SE Configuration would affect the N Mercer Way/77th Avenue SE intersection, while the 80th Avenue SE Configuration would affect the N Mercer Way/80th Avenue SE intersection. For the 77th Avenue SE Configuration, detours at 76th and 80th Avenues SE would be provided if closure of 77th Avenue SE was necessary. Construction of the roundabout could be phased to minimize or avoid closure of this intersection. For the 80th Avenue SE Configuration, closure of the intersection with N Mercer Way is unlikely, but partial lane closures of 80th Avenue SE may be needed, which would likely shift some traffic onto 77th Avenue SE and Island Crest Way.

Arterial and Local Street Operations

Table 3-11 shows that two intersections in the No Build condition would not meet the applicable LOS standard. Three locations with Option 2 would not meet the LOS standard and/or have vehicle queues that extend into the adjacent intersection and would be worse than the No Build condition in the AM and/or PM peak hours. All other study area intersections for Option 2 would meet LOS standards. All intersections would meet the LOS standard with Options 1 and 3. Appendix A, Transportation Technical Report, includes intersection LOS results for all the intersections in the study area.

The intersection of 77th Avenue SE and N Mercer Way would not meet agency LOS standards with Option 2, while the impacts at the other intersections on N Mercer Way and Island Crest Way would be related to vehicle queuing and intersection operations with Option 2. All impacts would be mitigated as discussed in Section 3.4.3. The intersection at Bellevue Way SE and the S Bellevue Park-and-Ride improves with the options during construction because the park-and-ride is closed to commuters.

Table 3-11. 2020 Intersection Impacts Summary - AM and/or PM Peak Hour

Intersection	Jurisdiction	No Build	Option		
			1	2	3
76th Ave. SE/N Mercer Way/I-90 Westbound on-ramp	WSDOT			X	
77th Ave. SE/N Mercer Way	Mercer Island	X		X	
Island Crest Way: between I-90 Westbound off-ramp and I-90 Eastbound on-ramp	WSDOT			X	
Bellevue Way SE/S Bellevue Park-and-Ride	Bellevue	X			

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and Island Crest Way HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and Island Crest Way HOV ramps

Option 3 - HOV lane between Mercer Island and Seattle converted to GP lane during construction

Impacts include failing to meet LOS standard or are related to queuing.

Travel Times

In the 2020 AM and PM peak conditions, there is no noticeable average travel time change between the No Build condition and options on local Mercer Island streets to and from I-90, with the mitigation as discussed in Section 3.4.3, except in the AM peak period for the westbound direction to Seattle with Option 2. All of the options would see a slight increase in travel times on local streets in the AM peak period for the westbound direction heading to Seattle compared to the No Build condition due to the closure of the center roadway ramps. As described in Section 3.3, the westbound direction in the AM peak period is about 30 percent of all the trips coming to or from Mercer Island. Refer to Table 3-12 for the local Mercer Island travel times to and from I-90 ramps. To understand the total change in travel time for Mercer Island trips, changes in local street travel times should be added to the changes in I-90 travel times discussed in Section 3.3.2.1.

The travel time change for trips heading into Seattle is, on average, less than 0.5 minute longer in Option 2 than in Options 1 or 3 in the AM peak. The largest travel time increase is associated with SOVs that would be able to access I-90 via the westbound Island Crest Way on-ramp in the No Build condition and Options 1 and 3, but use either the 76th Avenue SE or W Mercer Way on-ramps in Option 2. Travel time on local streets would increase by up to 3 to 4 minutes for these SOVs in Option 2 (about 5 percent of daily trips to and from Mercer Island I-90 ramps) and decrease for HOVs able to use the R-8A HOV lane (about 1.5 percent of daily trips to and from Mercer Island I-90 ramps). Besides this one change, travel times on the local streets to and from I-90 would not change for the majority of people because their access to or from I-90 would not change among options.

Table 3-12. 2020 Mercer Island Local Travel Times To and From I-90

Travel Time Path ^a	No Build	2020 Construction		
		Option 1	Option 2 ^b	Option 3
AM Peak Period (6:30 – 10:00 am)				
Mercer Island to Seattle (Westbound)	1.4 (0.3-3.2) ^b	2.0 (0.3-4.9)	2.3 (0.4-5.0)	2.0 (0.3-4.9)
Mercer Island to Bellevue (eastbound)	1.2 (0.4-2.7)	1.2 (0.4-2.6)	1.2 (0.4-3.0)	1.2 (0.4-2.6)
Seattle to Mercer Island (eastbound)	1.1 (0.4-3.1)	1.1 (0.4-3.1)	1.1 (0.4-3.1)	1.1 (0.4-3.1)
Bellevue to Mercer Island (westbound)	1.4 (0.2-2.0)	1.4 (0.2-2.4)	1.4 (0.2-2.6)	1.4 (0.2-2.4)
All Trips to/from Mercer Island	1.3 (0.2-3.2)	1.4 (0.2-4.9)	1.5 (0.2-5.0)	1.4 (0.2-4.9)
PM Peak Period (3:30 – 7:00 pm)				
Mercer Island to Seattle (Westbound)	1.7 (0.3-2.9)	1.5 (0.3-2.9)	1.7 (0.3-5.4)	1.4 (0.3-2.9)
Mercer Island to Bellevue (eastbound)	1.7 (0.5-3.3)	1.6 (0.4-3.1)	1.7 (0.5-3.3)	1.6 (0.4-3.0)
Seattle to Mercer Island (eastbound)	1.4 (0.5-3.0)	1.5 (0.4-3.1)	1.5 (0.6-3.1)	1.5 (0.4-3.1)
Bellevue to Mercer Island (westbound)	1.3 (0.2-2.6)	1.3 (0.2-2.6)	1.3 (0.2-2.6)	1.3 (0.2-2.6)
All Trips to/from Mercer Island	1.5 (0.2-3.3)	1.5 (0.2-3.1)	1.5 (0.2-3.3)	1.4 (0.2-3.1)

Notes:

The value outside of the parentheses indicates the person-weighted average travel time in minutes. The values inside the parentheses indicate the travel time range in minutes.

Option 1 - Mercer Island SOVs allowed in HOV lane and Island Crest Way HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and Island Crest Way HOV ramps

Option 3 - HOV lane between Mercer Island and Seattle converted to GP lane during construction

^a Travel time paths were measured between the I-90 ramp intersections and boundary of local travel time area defined in Exhibit 3-14. All vehicle trips to and from the I-90 on- and off-ramps within the local travel time area are included.

^b These travel times include all mitigation on Mercer Island described in Section 3.4.3.

Traffic Safety

With all of the options, a shift in traffic volumes occurs with the closure of the I-90 center roadway, its ramps, and the D2 Roadway. With this shift in volumes, the locations where crashes are expected to occur also change. In Seattle, at the 4th Avenue S at S Royal Brougham Way intersection, Options 1, 2, and 3 are predicted to have up to one more crash annually compared to the No Build condition due to an increase in traffic volume that results from the closure of the D2 Roadway ramp at 5th Avenue/Seattle Boulevard/Airport Way, which would have a decrease in crashes with the options compared to the No Build condition.

On Mercer Island local streets within the study area, about 30 crashes per year would be expected in the No Build condition. With the shift in volumes on Mercer Island associated with the closure of the center roadway the location of crashes would change in the future. Options 1 and 3 are predicted to experience about 1 additional crash per year on local streets compared to the No Build condition due to volume shifts.

With Option 2, SOVs are prohibited from using the westbound Island Crest Way HOV on-ramp and would likely get on I-90 at W Mercer Way and 76th Avenue SE. To access these locations, drivers would travel longer distances on local streets and have a shorter trip on I-90 from when they used Island Crest Way. Likely streets include W Mercer Way, N Mercer Way, SE 24th Street, and 76th Avenue SE, among others. This volume shift with Option 2 would result in one more crash per year occurring on the local streets compared to Options 1 and 3. This is offset by one less crash that would occur on I-90 between Island Crest Way and W Mercer Way, as described in Section 3.3.

For individual streets, Island Crest Way is predicted to have one less crash per year on average with Option 2 than Options 1 and 3 due to decreased volumes on this road. The intersection of 77th Avenue SE and SE 27th Street is predicted to have up to one less crash per year for all three options compared to the No Build condition. All other local streets and intersections show slight or no change in predicted crashes from the No Build condition for all options. Over 60 percent of the existing crashes on Mercer Island are property damage only crashes. The streets that drivers would likely use to access I-90 with Option 2 are posted at lower speeds than Island Crest Way and I-90, which typically correlate with lower-severity crashes.

The overall total number of crashes in the entire study area, including I-90 and Mercer Island local streets, is expected to be similar between Options 1 and 2 during construction. The total number of crashes with Option 3 would increase over Options 1 and 2 because Option 3 would have higher traffic volumes on I-90.

Parking

Neither the change in I-90 Operations nor the Transit Integration configurations would impact parking. The 77th Avenue SE and 80th Avenue SE Transit Integration configurations would involve construction in public right-of-way, but no on-street parking is located in the construction area.

East Link construction at the South Bellevue Park-and-Ride could increase the demand for parking at the Mercer Island Park-and-Ride when the existing 520-stall South Bellevue Park-and-Ride is closed in 2017. Consistent with the requirements of the East Link project ROD, Sound Transit will mitigate the temporary loss of the South Bellevue Park-and-Ride spaces during East Link construction with over 1,200 spaces within the South Bellevue Park-and-Ride travelshed, with existing unused capacity at 14 existing park-and-ride lots, expansion of two of these lots, and five new leased park-and-ride lots. Transit routes at these lots have been and will continue to be modified to improve service to Seattle, the destination of most users of the South Bellevue Park-and-Ride. With this mitigation, the high utilization of parking on Mercer Island, and the lack of unrestricted parking near the station, no impacts are expected despite the fact that, in some instances, commuters will need to transfer to travel to Seattle. There is low probability of hide-and-ride parking around the Mercer Island Station

because it has limited on-street parking north of the station, and on-street parking in the Town Center is by permit only.

3.4.2.2 Operational Impacts

Traffic Forecasts and Trip Distribution

Overall, by year 2035, the No Build condition traffic volumes in the local and arterial street study area are predicted to grow at an average annual growth rate of almost 1 percent in both the AM and PM peaks, which is slightly higher than the regional growth rate on I-90. The growth rate on local and arterial streets represents the growth on the local streets as well as the growth to and from I-90 during the AM or PM peak periods. Vehicle trips at the light rail stations were calculated based on the PM peak-period (3-hour) ridership forecasts for each station and included the PM peak bus service levels provided by the transit integration plan prepared for East Link. The net increases in vehicle and bus volumes compared to the No Build condition were added to the transportation network for each East Link station.

Forecasts during light rail operations include potential changes in local travel patterns for trips to and from I-90, as shown in Exhibits 3-17 and 3-18. Similar to travel pattern shifts during construction, in the AM peak with either of the options, the closure of the I-90 center roadway and associated ramps would result in drivers using the I-90 westbound on-ramps at Island Crest Way, 76th Avenue SE, and W Mercer Way. With Option 2, SOVs would shift from the Island Crest Way westbound on-ramp to the 76th Avenue SE and W Mercer Way on-ramps. In addition, with the R-8A HOV lanes in Option 2 only allowing HOVs and transit, some HOVs on Mercer Island would shift from using other I-90 ramps to the Island Crest Way westbound HOV on-ramp. With Option 2 during the AM peak hour, the Island Crest Way westbound on-ramp would decrease by approximately 400 vph while the W Mercer Way and 76th Avenue SE westbound on-ramps would each increase by about 200 vph compared to Option 1. As described in Section 3.4.2.1, this results in a net increase in daily traffic accessing the W Mercer Way and 76th Avenue SE westbound on-ramps equivalent to about 4 percent of all daily trips using I-90 ramps on Mercer Island (about 2,700 daily trips).

Arterial and Local Street Operations

Table 3-13 shows that six intersections would not meet agency LOS standards in the No Build condition. Two locations with Option 1 and five locations with Option 2 would not meet LOS standards and/or have vehicle queues that extend into the adjacent intersection and be worse than the No Build condition in the AM and/or PM peak hour. Three of the impacted locations for Option 2 are also impacted when East Link is under construction. Five intersections that do not meet the LOS standard in the No Build condition would improve with Options 1 and 2 because of volume traffic pattern changes with the project.

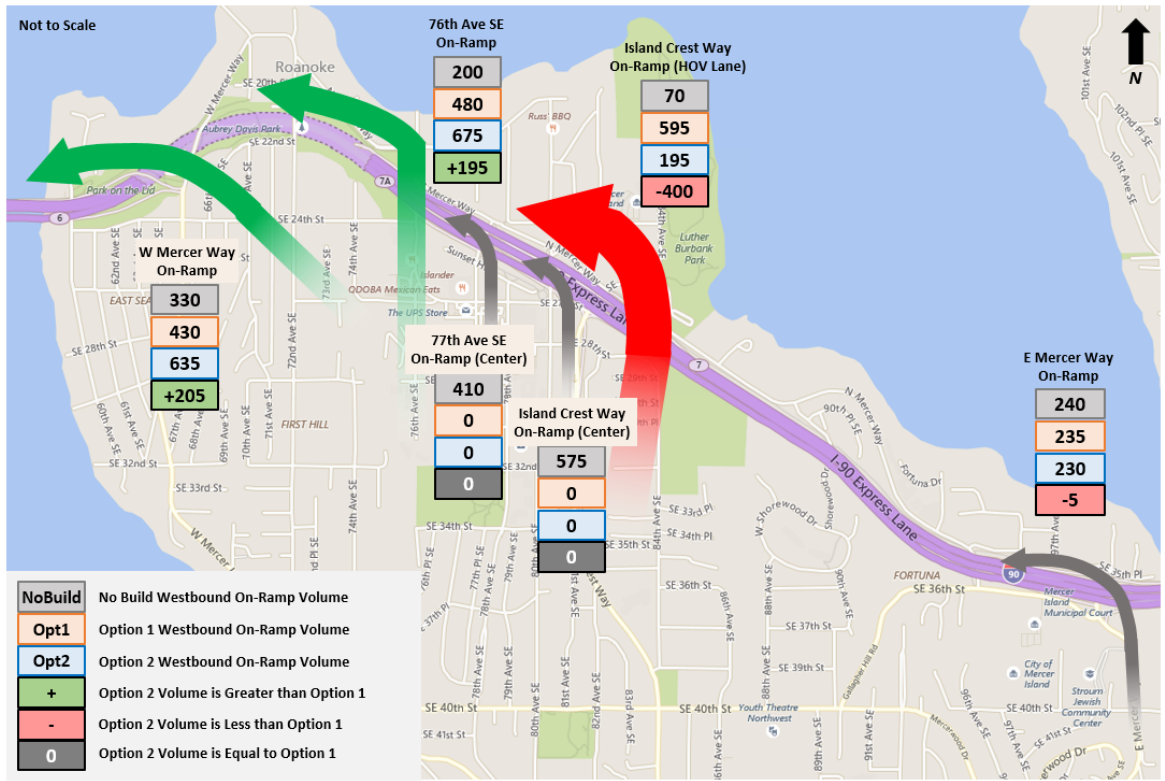


Exhibit 3-17. 2035 AM Westbound Travel Patterns from Mercer Island

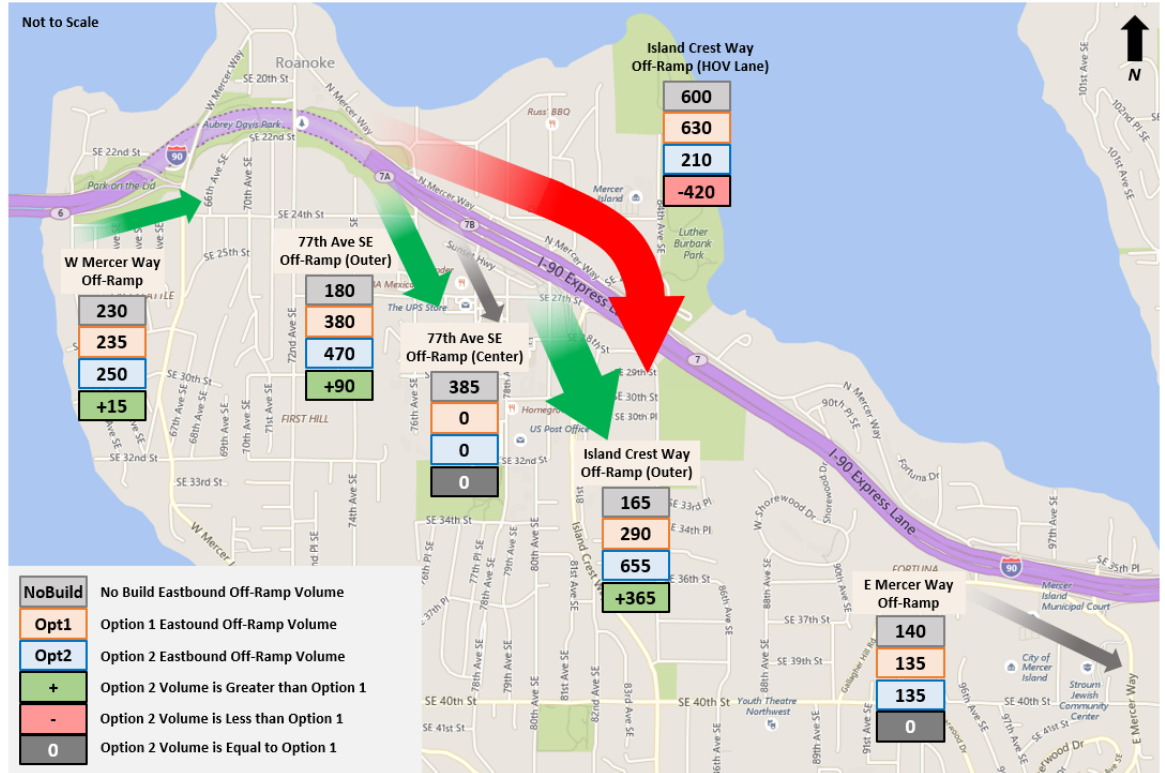


Exhibit 3-18. 2035 PM Eastbound Travel Patterns to Mercer Island

Table 3-13. 2035 Peak-Hour Intersection Impacts Summary

Intersection	Jurisdiction	No Build	Options	
			1	2
4th Ave. S/Seattle Blvd S/Airport Way S	Seattle	X		
Airport Way S/Seattle Blvd S/S Dearborn St/5th Ave. S	Seattle	X		
4th Ave. S/Royal Brougham Way	Seattle		X	X
Rainier Ave./S Dearborn Street	Seattle	X		
76th Ave. SE/N Mercer Way/I-90 Westbound on-ramp	WSDOT			X
77th Ave. SE/N Mercer Way	Mercer Island	X	X	X
80th Ave. SE/N Mercer Way	Mercer Island	X		
80th Ave. SE/SE 27th Street	Mercer Island			X
Island Crest Way: between I-90 Westbound off-ramp and I-90 Eastbound on-ramp	WSDOT			X
Bellevue Way SE/S Bellevue Park-and-Ride	Bellevue	X		

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and Island Crest Way HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and Island Crest Way HOV ramps

Impacts include failing to meet LOS standard or are related to queuing.

The intersections on N Mercer Way at 76th Avenue SE and at 77th Avenue SE, and the 80th Avenue SE and SE 27th Street intersection would not meet agency LOS standards with Option 2. Vehicle queues on Island Crest Way between the I-90 westbound off-ramp and eastbound on-ramp would exceed the northbound and southbound left-turn lane storages, causing congestion on Island Crest Way between the I-90 ramps in both directions. The intersection of N Mercer Way and 77th Avenue SE would not meet the LOS standard with Option 1. All impacts would be mitigated as discussed in Section 3.4.3. All other intersections would meet LOS standards. Intersection LOS results for all the intersections in the study area are provided in Appendix A.

The Transit Integration configurations would have differences in delay at some intersections, but there would be no difference in the intersection LOS at any location and therefore no difference in impacts.

Travel Time

In the 2035 AM and PM peak conditions, average travel times on local Mercer Island streets to and from I-90 do not exhibit any noticeable change between the two options except in the AM peak period for the westbound direction heading to Seattle with Option 2. Due to the closure of the center roadway ramps, both options would see a slight increase in travel times on local streets in the AM peak period for the westbound direction heading to Seattle compared to the No Build condition. Refer to Table 3-14 for the local Mercer Island travel times to and from I-90 ramps. To understand the total change in travel time for Mercer Island trips, changes in local street travel times should be added to the changes in I-90 travel times discussed in Section 3.3.2.2.

Table 3-14. 2035 Mercer Island Local Travel Times To and From I-90

Travel Time Path ¹	No Build	2035 Build	
		Option 1 ^a	Option 2 ^a
AM Peak Period (6:30 – 10:00 am)			
Mercer Island to Seattle (Westbound)	1.4 (0.3-3.2) ^b	1.8 (0.3-4.9)	2.1 (0.4-4.9)
Mercer Island to Bellevue (eastbound)	1.2 (0.4-2.4)	1.2 (0.5-2.7)	1.3 (0.2-2.9)
Seattle to Mercer Island (eastbound)	1.1 (0.4-3.1)	1.1 (0.4-3.1)	1.1 (0.4-3.1)
Bellevue to Mercer Island (westbound)	1.3 (0.2-2.1)	1.5 (0.2-2.7)	1.4 (0.2-2.1)
All Trips to/from Mercer Island	1.3 (0.2-3.2)	1.4 (0.2-4.9)	1.5 (0.2-4.9)
PM Peak Period (3:30 – 7:00 pm)			
Mercer Island to Seattle (Westbound)	1.6 (0.3-2.9)	1.6 (0.3-2.9)	1.7 (0.3-5.9)
Mercer Island to Bellevue (eastbound)	1.7 (0.5-3.2)	1.8 (0.6-3.5)	1.5 (0.6-3.4)
Seattle to Mercer Island (eastbound)	1.4 (0.4-3.1)	1.5 (0.4-3.1)	1.5 (0.4-3.1)
Bellevue to Mercer Island (westbound)	1.3 (0.2-2.5)	1.4 (0.2-2.5)	1.3 (0.2-2.5)
All Trips to/from Mercer Island	1.5 (0.2-3.2)	1.6 (0.2-3.5)	1.5 (0.2-5.9)

Notes:

Option 1 - Mercer Island SOVs allowed in HOV lane and Island Crest Way HOV ramps

Option 2 - Mercer Island SOVs not allowed in HOV lane and Island Crest Way HOV ramps

Travel time paths are measured between the I-90 ramp intersections and boundary of local travel time area defined in Exhibit 3-14. All vehicle trips to and from the I-90 on- and off-ramps within the local travel time area are included.

^a The value outside of the parentheses indicates the person-weighted average travel time in minutes. The values inside the parentheses indicate the person-weighted travel time range for accessing different ramps, in minutes. These times include mitigation on Mercer Island described in Section 3.4.3.

The travel time change for trips from Mercer Island to I-90 westbound would be, on average, less than 0.5 minute in the AM peak period. The largest travel time increase would be for SOVs accessing I-90 via the westbound Island Crest Way on-ramp in the No Build condition and Option 1, but using either the 76th Avenue SE or W Mercer Way on-ramps in Option 2 (about 5 percent of daily trips to and from Mercer Island I-90 ramps). Their travel time with Option 2 would increase up to 3 and 4 minutes compared to the No Build condition and Option 1 while some HOVs (about 1.5 percent of daily trips to and from Mercer Island I-90 ramps) would save time by shifting their route to use the Island Crest Way westbound on-ramp to access the R-8A HOV lane. Travel times on the local streets to and from I-90 would not change for the majority of people because their access to or from I-90 would not change between options.

Traffic Safety

On Mercer Island local streets within the study area, about 33 crashes per year would be expected in the No Build condition. As in the construction period, the shift in traffic patterns on Mercer Island, would change the location of crashes the future. Option 1 is predicted to experience about 2 more crashes per year on the local streets compared to the No Build condition due to volume shifts associated with the closure of the center roadway.

With Option 2, SOVs prohibited from using the westbound Island Crest Way HOV on-ramps would likely get on I-90 at W Mercer Way and 76th Avenue SE. To access these locations, drivers would travel longer distances on local streets and have a shorter trip on I-90 from when they used Island Crest Way. Likely streets include W Mercer Way, N Mercer Way, SE 24th Street, and 76th Avenue SE, among others. This volume shift with Option 2 would result in two more crashes per year occurring on the local streets compared to Options 1. This is offset by two less crashes that would occur on I-90 between Island Crest Way and W Mercer Way, as described in Section 3.3. The streets that drivers would likely use to access I-90 with Option 2 are posted at lower speeds than I-90, which typically correlate with lower-severity crashes.

For individual streets, Island Crest Way is predicted to have the greatest increase in crashes in Option 1. This increase would be less than one crash per year compared to the No Build condition and Option 2. All other roads are predicted to perform about the same as the No Build condition and show slight or no difference between the options. The intersection of Island Crest Way and SE 40th Street would experience an increase of less than one crash per year for both options compared to the No Build condition. The SE 27th Street and 77th Avenue SE intersection is predicted to experience one less crash per year for both options compared to the No Build condition.

There would be no change in the number of crashes between options at the study area intersections in Bellevue or Seattle. Therefore, there are expected to be about 5 fewer crashes per year overall in the entire study area, including I-90 and local Mercer Island streets, with Option 2 than with Option 1.

Parking

There would be no loss of parking spaces or changes in parking with any of the Transit Integration refinements and no impacts to parking would occur during operation for either I-90 operation option. As described in the Final EIS, there would be no parking spaces lost with the Mercer Island Station and there would be low potential for parking impacts because the South Bellevue Station would provide approximately 1,500 stalls, providing westbound riders with a higher parking capacity option near I-90. There is low probability of hide-and-ride parking around the Mercer Island Station because it has limited on-street parking north of the station and on-street parking in the Town Center is by permit only.

3.4.3 Mitigation

All mitigation measures associated with constructing the East Link Extension, including the I-90 Operations options and Transit Integration configurations, would comply with state and local regulations governing construction traffic control and construction truck routing. Sound Transit would

finalize detailed construction mitigation plans in coordination with local jurisdictions and WSDOT during final design and permitting. Mitigation for traffic impacts due to construction would be addressed by the measures provided in the East Link Final EIS, including the following:

- Follow standard construction safety measures, such as installing advance warning signs, installing highly visible construction barriers, and using flaggers.
- Use lighted or reflective signage to direct drivers to truck haul routes and enhance visibility during nighttime work hours.
- In areas with high levels of traffic congestion, schedule traffic lane closures and high volumes of construction traffic during off-peak hours to minimize delays where practical.
- Communicate public information through tools such as print, radio, posted signs, websites and e-mail to provide information regarding street closures, hours of construction, business access, and parking impacts.

Temporary detours, lane closures or road closures may be needed for construction of mitigation measures. Construction mitigation measures would be similar for the Transit Integration configurations.

Table 3-15 shows locations where mitigation would be needed for the Options 1 and 2 impacts identified in Section 3.4.2 and the period when it would be needed. Option 3 would not require any mitigation. These impacts can be mitigated with modifications to the intersection controls or on-ramp operations, with traffic signals, minor widening and/or restriping, and/or with signing, which will be implemented as part of the East Link project. Final mitigation would be as agreed to with the agency of jurisdiction for each location.

These mitigation measures would improve the AM and PM peak hour intersection delay and/or reduce vehicle queues that extend into adjacent intersections to the same or better than the No Build condition. Appendix A provides the intersection results with these intersection treatments for the AM and PM peak hours.

For construction mitigation measures that cannot be completed in their permanent form prior to the start of East Link construction on I-90 in June 2017. WSDOT and Sound Transit would implement temporary mitigation measures prior to closure of the center roadway, or soon thereafter, once approvals are obtained. Temporary measures could include installation of temporary traffic signals, hiring a traffic control officer, or other measures agreed to with the agency of jurisdiction. Permanent mitigation measures would be implemented prior to East Link beginning operation in 2023. City of Mercer Island permits and/or approvals are required for temporary and permanent mitigation on city streets.

Table 3-15. Mitigation for Options 1 and 2

Number	Mitigation Location	Period of Impact	Option Required
1	4th Ave. S/Royal Brougham Way intersection	Operations	Options 1 and 2
2	76th Ave. SE/N Mercer Way/ I-90 Westbound On-ramp intersection	Construction	Option 2
3	77th Ave. SE/N Mercer Way intersection	Construction	Option 2
		Operation	Option 1
4	80th Ave. SE and SE 27th St. intersection	Operation	Option 2
5	Island Crest Way: between I-90 Westbound Off-ramp and I-90 Eastbound On-ramp	Construction	Option 2

Safety performance within the overall study area, including the I-90 freeway and local Mercer Island streets, would be expected to be similar or improved with Option 2 compared to Options 1 and 3. The severity of crashes is expected to decrease as some traffic shifts to streets with lower speed limits. No mitigation would be needed to address safety.

Although there is low potential for hide-and-ride parking at the Mercer Island Station, Sound Transit will inventory existing on-street parking around the Mercer Island Station up to one year prior to starting service, and will evaluate hide-and-ride impacts at the Mercer Island Station within one year of starting operations, consistent with the 2011 Record of Decision. If impacts are determined, Sound Transit and the City of Mercer Island will work with the affected stakeholders to identify and implement appropriate mitigation measures. Parking control measures, when deemed needed and effective to address adverse impacts, would consist of parking meters, restricted parking signage, passenger and truck load zones, and residential parking zone (RPZ) signage. Other parking mitigation strategies could include promotion of alternative transportation services (e.g., encourage the use of bus transit, vanpool or carpool services, walking, or bicycle riding).

For parking controls agreed to with the local jurisdiction and community, Sound Transit will be responsible for the cost of installing the signage or other parking controls and any expansion of the parking controls for one year after opening East Link. The local jurisdiction will be responsible for monitoring the parking controls and providing all enforcement and maintenance of the parking controls. The local residents will be responsible for any RPZ-related costs imposed by the local jurisdiction.

3.4.4 Comparison to FEIS

The Final EIS identified five locations on Mercer Island with impacts from the East Link project (Final EIS Preferred Alternative) and two locations for options that were not included in the project selected in 2011 by the Sound Transit Board. Mitigation for these impacts was proposed by the start of light rail service. No impacts were identified in Seattle or Bellevue in the Final EIS.

Based on this updated analysis, three locations would have impacts at the start of construction on Mercer Island and two more (one each in Seattle and Mercer Island) after the start of light rail service for Option 2. There are two intersections that no longer have impacts compared to the Final EIS, and three new locations with impacts. The two intersections that no longer have impacts are W Mercer Way and 24th Avenue SE, and 77th Avenue SE and I-90 Eastbound off-ramp. Options 1 and 2 would continue to have an impact at 77th Avenue SE and N Mercer Way, which was identified in the Final EIS. The locations that have new mitigation (based on the applicable LOS standards or vehicle queues) not previously identified in the FEIS are:

- 4th Avenue S/Royal Brougham Way (Options 1 and 2)
- 76th Avenue SE/N Mercer Way/ I-90 Westbound On-ramp (Option 2 requires additional mitigation at this location compared to the FEIS)
- Island Crest Way/N Mercer Way/I-90 westbound off-ramp and I-90 eastbound on-ramp (Option 2 only)

There would be no change in parking impacts or mitigation from the Final EIS.

The safety methodology for this analysis is different than the Final EIS safety methodology because it is based on quantitative *Highway Safety Manual* methods that are more detailed and did not exist at the time of the previous analysis. Predicted crash frequencies were not reported in the Final EIS for specific roads or intersections and therefore cannot be compared with the predicted annual crash rates for any of the options. However, between options, overall safety conditions are better with Option 2 than Option 1, the same option studied in the Final EIS, and also with Option 3.

The change in local street impacts and mitigation are within the range identified in the Final EIS.

3.5 Non-Motorized

This section evaluates potential environmental impacts to non-motorized (bicycle and pedestrian) facilities, from changes in I-90 Operations conditions and Transit Integration configurations. In Seattle and Bellevue, these changes do not affect non-motorized facilities and are therefore not discussed.

3.5.1 Affected Environment

On Mercer Island, the majority of the streets in the Mercer Island Town Center have sidewalks. Nearly all of the commercial activity on Mercer Island is centralized in the Mercer Island Town Center, making it a common destination for residents and pedestrians. There are also sidewalks near schools and along other streets on the island. There are several trails and paved and unpaved shoulders throughout the island, providing for pedestrians. Most residential areas, including the area north of I-90 and Mercer Island Park-and-Ride, do not have sidewalks.

Connecting Seattle, Mercer Island, and Bellevue, the I-90 Mountains to Sound Trail provides a trail running across the north end of the island along the I-90 corridor, providing a regional connection for pedestrians and bicyclists. The I-90 Trail originates at Sturgis Park in Seattle and crosses Lake Washington along the north side of I-90, continues through Mercer Island, and ends at Mercer Slough

Nature Park in south Bellevue. It also connects with a bike route that circles the island using W Mercer Way and E Mercer Way. The I-90 Trail crosses Aubrey Davis Park (formerly I-90 Lid Park), which provides multiple connections across I-90 between residential areas north of I-90 and the Town Center. Sidewalks located along 76th Avenue SE, 77th Avenue SE, 80th Avenue SE, and Island Crest Way provide pedestrian and bicycle connectivity across I-90. Crosswalks and wider sidewalks are present throughout most of the commercial area in Mercer Island, in addition to some pedestrian-friendly roadway elements such as bulb-outs and street trees. There are no school walk routes on Mercer Island within 0.5 mile of the Mercer Island Station. Currently, approximately 250 pedestrians cross N Mercer Way to and from the Mercer Island Park-and-Ride to bus stops on the south side of the street during the AM and PM peak hour.

There are bicycle facilities on both sides of most arterial streets on Mercer Island, including N Mercer Way, Island Crest Way, and 78th Avenue SE. W Mercer Way and SE 40th are designated primary bicycle corridors identified in the Mercer Island Pedestrian and Bicycle Facilities Plan (City of Mercer Island, 2010). These roads all currently have paved shoulders, sidewalks, or separated pathways on at least one side of the road. E Mercer Way has a paved shoulder on the west side of the road, which continues along the east side of the road as it becomes W Mercer Way. There are sidewalks or separated pathways on both sides of SE 40th Street between Island Crest Way and 78th Avenue SE. A sidewalk is present on the south side of the road from 78th Avenue SE to W Mercer Way. A bicycle lane is present on the south side of SE 40th Street and sharrows are present in the westbound (northern) lane from Island Crest Way to 78th Avenue SE.

Sharrows

A sharrow is a marking on the pavement indicating that the travel lane is shared by motor vehicles and bicycles. This shared-lane marking typically consists of a bicycle symbol with arrows indicating the direction of travel, and is placed on the side of the lane where bicycles are likely to occur.

Along SE 40th Street, there are two school zones, which are for West Mercer and Northwood Elementary schools. School zones have 20-mph vehicle speed limits with flashing beacons that turn on when most students are present, which is about one hour as school starts and another hour as school ends (school starts at 9:10 a.m. and ends at 3:45 p.m.). During this time, there are safety patrols who guide students across the street. At West Mercer Elementary, the school zone is along SE 40th Street from approximately 83rd Avenue SE to 79th Avenue SE. School crossings of SE 40th Street have signed and painted crosswalks at 80th, 81st, and 82nd Avenues SE. A school zone is also present on W Mercer Way around the southern entrance to West Mercer Elementary, south of SE 40th Street. At Northwood Elementary, the school zone is also along SE 40th Street from 85th Avenue SE to Mary Wayte Pool. Speed humps are present along 86th Avenue SE from SE 40th Street south to Island Crest Way.

There were 7 vehicle-pedestrian crashes and 12 vehicle-bicycle crashes between 2011 and 2015 on the Mercer Island streets where traffic volumes could shift between options. Refer to Section 3.4 for more information on local traffic patterns on Mercer Island.

3.5.2 Environmental Impacts

This section compares the impacts of the Transit Integration configurations and I-90 Operations conditions on non-motorized facilities and pedestrian safety.

3.5.2.1 Construction Impacts

Non-Motorized Facilities

The changes in I-90 Operations would not have any impacts on non-motorized facilities and therefore only the Transit Integration configurations are discussed in this subsection. Construction of the FEIS Configuration would require temporary closure of the path over I-90 on the west side of 80th Avenue SE. Pedestrians and bicycles traveling across I-90 in this area would need to cross the freeway at 77th Avenue SE to the west or Island Crest Way to the east.

For the 77th Avenue SE Configuration, construction of the roundabout could affect pedestrian and bicycle movement through the 77th Avenue/N Mercer Way intersection. Pathways are present on both sides of N Mercer Way east of 77th Avenue SE, and Sound Transit would try to keep at least one path open at all times to maintain connectivity. If temporary closures of the intersection are needed, detours would be provided on 76th Avenue and 80th Avenue to cross I-90, or the relocated pathway on the north side of the roundabout could be constructed prior to any closures.

Similar to the FEIS Configuration, for the 80th Avenue SE Configuration, construction of the bus transfer area would require temporary closure of the path over I-90 on the west side of 80th Avenue SE. Pedestrians and bicyclists traveling across I-90 in this area would need to cross the freeway at 77th Avenue SE to the west or Island Crest Way to the east.

Safety

Predicted non-motorized crashes are included as part of the total number of overall crashes estimated in Section 3.4. As described in Section 3.4.2.1, with all of the options during construction, closure of the I-90 center roadway and its ramps would shift the location of a few crashes from I-90 and Island Crest Way to other local streets on Mercer Island.

Non-motorized safety conditions on the local streets for Option 1 and Option 3 during construction would be similar to the No Build condition, but there would be a slight change with Option 2 on Mercer Island. Per the *Highway Safety Manual* methodology, Option 2 would have slightly more than 1 additional pedestrian/bicycle crash every 20 years on the streets within the local study area compared to Options 1 and 3. This correlates to about a 1 percent increase based on the existing number of non-motorized crashes over a similar time period. Most of the streets where traffic would shift with the options have sidewalks and/or paved shoulders or pathways that are recognized by the City as bicycle facilities. Along SE 40th Street, there are clearly designated school zones with slower speeds and safety patrols before and after school. The streets that drivers would use to access I-90 in Option 2 likely have greater pedestrian and bicycle activity than Island Crest Way, but also have lower speeds, which typically correlates with lower-severity crashes.

3.5.2.2 Operational Impacts

Non-motorized Facilities

The changes in I-90 Operations would not have any impacts on non-motorized facilities and therefore only the Transit Integration configurations are discussed in this subsection. Under the No Build condition, the number of pedestrians crossing N Mercer Way would remain around 250 during the PM peak hour based on expected bus routes and because parking on the north side of the road would be

limited to the existing parking garage. The FEIS Configuration would have the same amount of pedestrians crossing during the peak hour.

With the 77th Avenue SE Configuration, approximately 1,300 pedestrians in the peak hour would cross N Mercer Way between the I-90 bus route stops located on the north side of N Mercer Way and the light rail station. With the 80th Avenue SE Configuration, riders would transfer between buses and light rail without crossing any public roadways. The only pedestrians crossing N Mercer Way to access the stations and buses would be those parked at the parking garage, which would be similar to the No Build condition at around 250 during the peak hour.

Safety

Non-motorized crashes are included as part of the total number of overall crashes estimated in Section 3.4. As described in Section 3.4.2.2, closure of the I-90 center roadway and its ramps would shift the location of a few crashes from I-90 and Island Crest Way to other local streets on Mercer Island. Non-motorized safety conditions on the local streets for Option 1 would be similar to the No Build condition, but there would be slight changes with Option 2 on Mercer Island. Per the *Highway Safety Manual* methodology, Option 2 would have slightly more than 1 additional pedestrian/bicycle crash every 10 years on the streets within the local study area compared to Option 1. This correlates to less than a 3 percent increase based on the existing number of non-motorized crashes over a similar time period. Along SE 40th Street, there are clearly designated school zones with slower speeds and safety patrols before and after school. Overall, the streets that drivers would use to access I-90 in Option 2 likely have greater pedestrian and bicycle activity but lower speeds than Island Crest Way, which typically correlates with lower-severity crashes, and have paved shoulders, sidewalks, or separated pathways that are recognized by the City as bicycle facilities.

3.5.3 Mitigation

To address potential construction impacts for either the 77th Avenue SE or 80th Avenue SE Transit Integration configuration, mitigation would be similar to that described in the Final EIS. Sound Transit would minimize potential impacts on pedestrian and bicycle facilities from East Link construction by providing detours within construction areas or clearly delineating pedestrian and bicycle facilities within construction areas, and would notify the public as appropriate. Multi-use trails, such as the I-90 Trail, that might be affected by construction would generally be kept open for use, but detours would be provided when trails are closed unless they are closed for short durations or are in areas where a detour option is not feasible. Public notifications would be issued for temporary trail closures during construction.

No operational impacts to non-motorized users were identified with the 80th Avenue SE Configuration and no mitigation is needed for this configuration.

For the 77th Avenue SE Configuration, potential improvements that could be considered to increase the pedestrian capacity at the N Mercer Way/80th Avenue SE include creating a pedestrian all-way crossing phase intersection or providing wider crosswalks and larger waiting areas at the intersection corners to accommodate pedestrians bunching and waiting for a walk signal.

Non-motorized crashes are expected to be similar among all of the options during construction and operations on Mercer Island local streets. Therefore, no mitigation is proposed to address non-motorized safety.

3.5.4 Comparison to Final EIS

Compared to the Final EIS, only the 77th Avenue SE Configuration would have a potential change in impacts due to an increased number of pedestrians crossing N Mercer Way. This impact could be mitigated as discussed in Section 3.5.3.2. Impacts from the changed I-90 Operations and Transit Integration configurations are within the range of impacts evaluated in the Final EIS and can be mitigated. For a comparison to the Final EIS safety analysis, As described in Section 3.4.4. the safety methodology is different than the one used in Final EIS and cannot be compared. However, non-motorized crashes are expected to be similar among all of the options during construction and operations.

3.6 Freight

There would be no difference in freight impacts from the Final EIS with the Transit Integration scenarios and therefore they are not discussed in this section. With the Transit Integration configurations, fewer buses per day would be traveling in and around Mercer Island Town Center compared to existing conditions. Roadway changes to accommodate the integration configurations would continue to provide access on the same paths as existing conditions for freight vehicles into and out of Mercer Island Town Center. Impacts to freight resulting from the changes in I-90 Operations are described in this section.

3.6.1 Affected Environment

Within the study area, there are key freight corridors that serve not only the Puget Sound region but also national and international markets. These corridors include I-90 and I-5, as well as many local truck routes with a primary purpose of facilitating the flow of freight to and from local businesses. To prioritize these truck routes, WSDOT adopted the Freight Goods Transportation System (FGTS), which classifies roadways according to the amount of annual tonnage transported along these roads. Jurisdictions determine their designated truck route system on arterial streets according to the FGTS classifications.

I-90 is an east-west key truck route connecting local, interstate, and regional freight activity with the ports of Seattle and Tacoma and surrounding industrial areas across Lake Washington. I-90 serves the international and national markets and is the second most heavily used highway, following I-5, for truck movement in Washington (WSDOT, 2016b).

Over the course of a year, more than 44 million tons of freight are hauled across I-90, resulting in its designation as the T-1 FGTS Classification. About 3.9 percent of daily trips on I-90 are truck trips (based on WSDOT permanent traffic recorder data from January 2016 through May 2016), west of the Rainier Avenue interchange. Many of these freight trips traveling on I-90 across Lake Washington are likely to be to or from the Port of Seattle or other major transportation hubs, such as Seattle-Tacoma International Airport, and to other business and consumer destinations.

Truck volumes are highest on I-90 west of Rainier Avenue from the end of the AM peak period through the midday period (from 9:00 a.m. to 2:00 p.m.). During the early afternoon, truck volumes dramatically decrease to avoid the congestion during the PM peak period and trucks constitute only about 2 percent of total traffic during this period. This differs from general traffic volume peaking patterns on I-90, where just over 40 percent of the total daily volume occurs during the AM and PM peak periods. Truck volumes are less than 5 percent of the total traffic from 6 a.m. through 9:00 a.m. and from 2:00 p.m. through the rest of the day. Truck volumes are more than 6 percent of the total traffic from 1:00 a.m. to 4:00 a.m. and from 10:00 a.m. to 1:00 p.m.

Vehicle weight restrictions established for I-90 require vehicles over 10,000 pounds (for example, tractor-trailers) to only travel on the outer I-90 mainline roadways—vehicles over 10,000 pounds are prohibited from using the reversible center roadway. In addition, trucks less than 10,000 pounds (for example, delivery and recreational vehicles) are allowed to use the center roadway only if they either are an HOV or are heading to or from Mercer Island. Therefore, only a small percentage of trucks travel in the reversible center roadway compared with the I-90 outer mainline roadways.

There are no roadways designated as truck routes on Mercer Island. In the AM peak hour, truck traffic is 5 percent or less on 77th Avenue SE and 80th Avenue SE within the Town Center. On SE 27th Street and N Mercer Way, eastbound and westbound morning peak hour truck percentages are between 2 and 6 percent. Truck percentages southbound on Island Crest Way between the Town Center and SE 40th Street are higher at approximately 6 to 7 percent.

During the PM peak hour, truck percentages are lower than in the AM peak. In the Town Center, truck percentages generally range between 1 and 2 percent on most roadways. On Island Crest Way, truck percentages south of SE 28th Street are 2 percent or less during the PM peak hour in both directions.

For most of these truck trips, it is expected that these are single-unit trucks rather than large commercial vehicles because Mercer Island does not have large commercial and industrial activity areas compared to other areas of the region. Truck traffic that is more commercially oriented would be focused in the Town Center for deliveries to businesses.

3.6.2 Environmental Impacts

With all of the options, the large majority of truck traffic crossing Lake Washington between Seattle and I-405 would continue to use the eastbound and westbound I-90 outer roadways, similar to the No Build condition. With East Link closing the center roadway to traffic, the relatively lower volume of trucks traveling to and from Mercer Island would use the outer roadway ramps. The impacts are generally similar among Options 1, 2, and 3, with the exception of the Island Crest Way HOV ramps between Seattle and Mercer Island. Under the No Build condition, Option 1, and Option 3 conditions, trucks that are SOVs would be allowed to use these ramps. SOV trucks in Option 2 would not be allowed to use the left-side ramps and would need to use other GP ramps on Mercer Island to travel to or from Seattle. For example, the eastbound GP on-ramp from Island Crest Way is open to trucks at all times. Currently, 2 percent of the traffic using the Island Crest Way westbound on-ramp is considered to be trucks.

3.6.2.1 Construction Impacts

During construction, freight travel times across I-90 between Seattle and I-405 are expected to be similar to or better than the No Build condition. In the AM peak hour, freight would continue to travel in the GP lanes on the outer roadway of I-90 across Lake Washington. With additional capacity for HOVs provided at the completion of the R-8A HOV lanes, travel times in the GP lanes are expected to stay similar or improve between Seattle and I-405 for all options compared to the No Build condition travel times. Among the options, travel times between Seattle and I-405 are similar to within a few minutes of each other. In the westbound direction, all options have similar travel time performance in the AM peak, but in the PM peak period, Options 1 and 3 would have 3 to 4 minutes of faster travel than in Option 2 although all options would be less than the No Build condition. In the eastbound direction, travel times in the AM and PM peaks would be similar or improved in the options compared to the No Build condition. Refer to Section 3.3, Highway Operations and Safety, for further discussion on I-90 travel times.

Truck access to and from Mercer Island would be similar among Option 1, Option 3, and the No Build condition. For Option 2, GP (including truck) vehicles would not be allowed to use the Island Crest Way westbound HOV on-ramp to I-90 and would need to adjust their route to use either W Mercer Way or 76th Avenue SE on-ramps. This would create up to a 3- to 4-minute-longer travel time on the local streets if trucks are coming from the southern part of Mercer Island on Island Crest Way. Since most commercial freight activity is within the Town Center area, which does not have convenient access to the westbound Island Crest Way ramp, the travel times are expected to be similar among options because trucks would likely use similar ramps to travel to and from the Town Center.

3.6.2.2 Operational Impacts

During operations, travel times in the GP lanes in both options would generally be similar to or better than the No Build condition due to the additional vehicle capacity in both directions of I-90 with the completion of the R-8A HOV lanes between Seattle and I-405 and as people shift modes and ride light rail. One exception is in the eastbound direction during the AM peak period, where travel times with the options could be approximately 1 to 2 minutes longer than the No Build condition. In the PM peak period, eastbound travel times for both options would be faster than the No Build condition. In the westbound direction, both options would have shorter travel times than in the No Build condition. In the AM peak they are similar, but in the PM peak period, Option 1 would have up to 4 minutes of faster travel than Option 2. Refer to Section 3.3, Highway Operations and Safety, for further discussion.

Truck access to and from Mercer Island would be similar between the No Build condition and Option 1. With Option 2, GP (including truck) vehicles would not be allowed to use the Island Crest Way westbound HOV on-ramp to I-90 and would need to adjust the route to use either W Mercer Way or 76th Avenue SE on-ramps. This would create up to a 3- to 4-minute-longer travel time on the local streets if trucks are coming from the south on Island Crest Way on Mercer Island. As most commercial freight activity would be within the Town Center, which does not have convenient access to the westbound Island Crest Way ramp, the travel times are expected to be similar between options because trucks would likely use similar ramps to travel to and from the Town Center.

3.6.3 Mitigation

As described in the Final EIS, Sound Transit would coordinate with I-90 freight stakeholder groups by providing construction information to WSDOT for use in the state's freight notification system during construction. Sound Transit would provide information in a format required by WSDOT and compensate WSDOT for any direct costs associated with use of the freight notification system for project construction. No additional mitigation would be needed.

The I-90 Operations options would not require additional mitigation for freight mobility and access because truck routes would be maintained and freight mobility on I-90 between Seattle and I-405 would reflect SOV travel times that are generally similar or improved with the project. As described in Section 3.4, Arterials and Local Streets, intersection improvements would be implemented for local street operations impacts and those would also provide benefits to trucks.

3.6.4 Comparison with Final EIS

There would be no changes to freight mobility or access when compared to the Final EIS with mitigation to local streets. No additional mitigation is proposed for I-90 Operations and therefore no mitigation is required for freight impacts.

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