

MERCER ISLAND TRANSIT INTERCHANGE

Operational and Configuration Study—Executive Summary

Background/Purpose Statement

The Mercer Island Transit Interchange Operational and Configuration Study, conducted by David Evans and Associates, Inc. (contracted by Sound Transit), explores ways to implement bus/rail integration consistent with the Settlement Agreement between the City of Mercer Island and Sound Transit for the East Link Project. While the City of Mercer Island and Sound Transit are the sole signatories to this Settlement Agreement, the agreement provides that the 77th Avenue SE Configuration¹ cannot be implemented without concurrence from King County Metro (KCM or Metro). As such, all three agencies—in consultation with the Washington State Department of Transportation (WSDOT)—have collaborated to study and identify bus/rail integration opportunities and operational needs on Mercer Island.

KCM has raised concerns regarding the 77th Avenue SE Configuration modifications as described in the Settlement Agreement that would create significant tradeoffs and negatively impact current and future KCM operational needs and Mercer Island residents and businesses, including (but not limited to):

- Unpredictable and increased transfer times between bus and rail modes;
- Reduction in connectivity to Mercer Island, noting that an existing 150 to 175 daily trips originate or end at Mercer Island to/from areas that will not be served by East Link; and
- Additional non-island traffic on Mercer Island and non-island commuters at Mercer Island Park & Ride.

The proposed transit interchange would be generally located along North Mercer Way between 77th Avenue SE and 80th Avenue SE adjacent to the future Mercer Island East Link light rail station (see **Figure 1**).



Figure 1: Vicinity Map

¹ As identified in the 2017 *State Environmental Policy Act (SEPA) Addendum to the East Link Extension Final Environmental Impact Statement (FEIS)* pursuant to a defined set of modifications. Per the Settlement Agreement, the 80th Avenue SE Configuration from the *SEPA Addendum* was eliminated from consideration.

Project Goals and Objectives

Sound Transit, Mercer Island, and KCM developed the following eight goals/objectives for the proposed transit interchange on Mercer Island:

- **Goal/Objective 1: *Create a seamless transfer experience for the customer that is intuitive, safe, barrier-free, weather-protected, and efficient.***
- **Goal/Objective 2: *Create a transit interchange that minimizes transfer walk distance and number of street crossings for bus/rail transfers.***
- **Goal/Objective 3: *Create a transit interchange that is ready for operation when the East Link light rail service begins in 2023.***
- **Goal/Objective 4: *Develop a cost-effective design that represents a transparent and appropriate use of public funds.***
- **Goal/Objective 5: *Maximize benefits to Mercer Island residents and local employers.***
- **Goal/Objective 6: *Minimize potential overall property impacts and local community access impacts and maintain through-vehicular traffic on the 80th Avenue SE bridge crossing.***
- **Goal/Objective 7: *Provide excellent multi-modal access for customers while minimizing general pedestrian, bicycle, and vehicle mobility impacts near bus drop-off locations.***
- **Goal/Objective 8: *Limit diesel idling and limit regional bus circulation through the town center.***

These goals and objectives were used to evaluate various potential refinements to the 77th Avenue SE Configuration, as discussed below.

Implementing the 77th Avenue SE Configuration

Three transit interchange configurations were developed in an effort to implement the 77th Avenue SE Configuration while maintaining Sound Transit's and KCM's ability to optimize bus service for Mercer Island. In addition to a new roundabout at the intersection of 77th Avenue SE and North Mercer Way (see **Exhibit A**), each configuration is consistent with key modifications to the 77th Avenue SE Configuration, including:

- Limiting future bus volumes to no greater than existing volumes;
- No routing of regional KCM buses through downtown Mercer Island;
- Limiting bus layovers to an average of fifteen (15) minutes; and
- No idling of buses.

Importantly, these configurations will allow KCM to provide transit service to Mercer Island, furthering the City's commitment to sustainability and livability by reducing Greenhouse Gas (GHG) emissions.

Potential environmental impacts as a result of any of these configurations were previously accounted for in prior environmental analyses and no additional environmental review is required.

Each of the configuration options differ in the amount of curb space allocated to transit uses, and ultimately, the amount of transit service to Mercer Island; each option will include refinement of at least some of the modifications to the 77th Avenue SE Configuration outlined in the Settlement Agreement.

The Settlement Agreement limits bus layover times to no more than 15 minutes—and then only during the afternoon peak period (3:30 PM to 7:00 PM) could prohibit any level of service on Mercer Island, including

local Mercer Island service. KCM cannot legally limit bus layover durations that conflict with labor contract requirements mandating operator rest periods. However, typical layover times are approximately 15 minutes or less so the majority of layovers would meet the intent of this layover limit. Additionally, KCM would not be able to provide needed peak service to Mercer Island, or all-day on-island service, if layovers are limited to the afternoon peak period.

Existing Conditions and Existing Transit Service (Baseline)

Currently, Sound Transit and KCM provide bus service to Mercer Island. ST Express Bus Routes (550 and 554) comprise approximately half of bus traffic on Mercer Island during the AM and PM peak periods, accounting for 18 AM and 17 PM peak hour bus trips, approximately half of total peak hour bus trips in each AM and PM peak hour.² By comparison, the seven (7) KCM Bus Routes account for 18 and 22 bus trips in the AM and PM peak hours, respectively. Based on the current schedule, approximately one bus (ST or KCM) arrives to North Mercer Way every 2 minutes during both the AM and PM; although it is not uncommon for two buses to arrive at the same time. Curb space allocations and operations are detailed and illustrated—for both existing and proposed configurations—in **Table 1** and **Figure 2**.

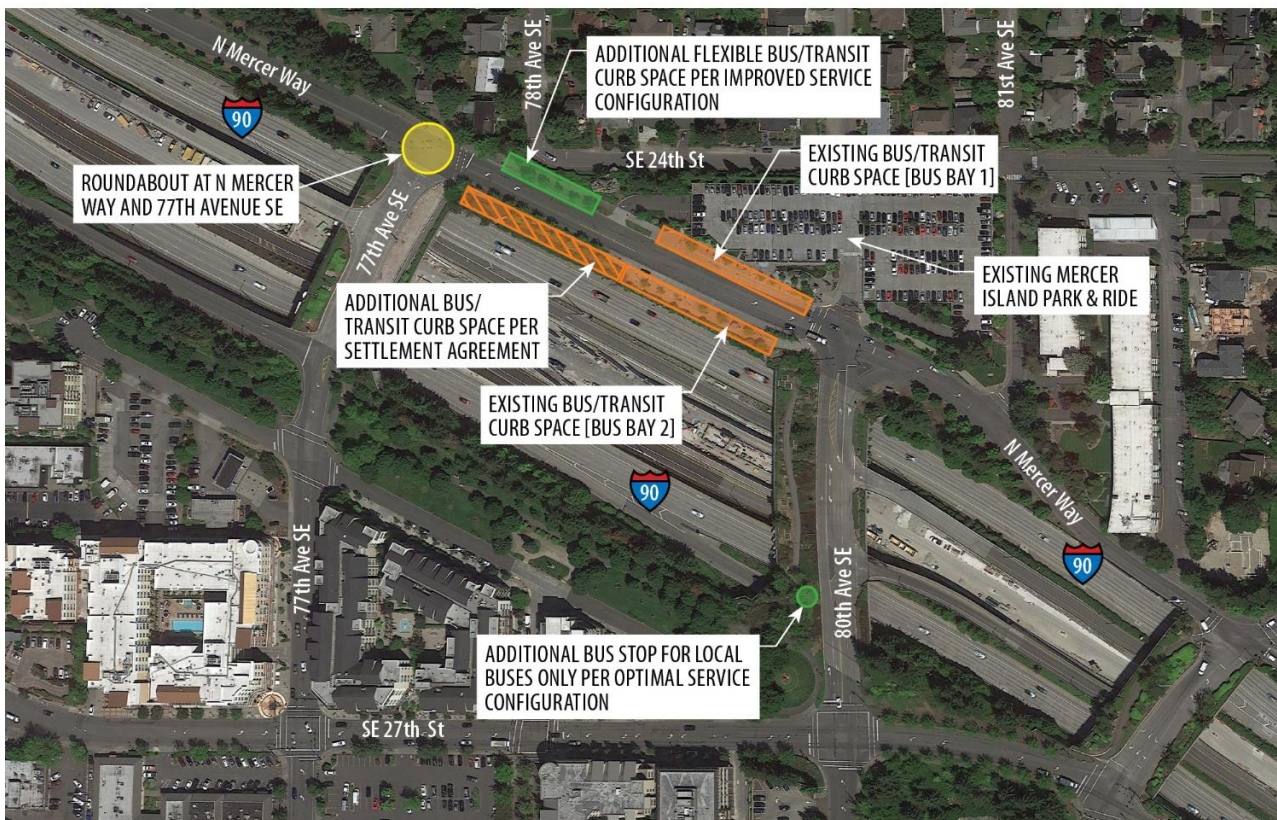


Figure 2: Existing and Proposed Transit Interchange Configurations

² It is anticipated that Sound Transit will no longer provide express bus service to Mercer Island once East Link begins revenue service in 2023.

Table 1. Existing and Proposed Curb Space Configurations

Location	Pick-Up/Drop-Off Bays	Flexible/Layover Bays	Estimated Peak Hour Service
Existing Conditions and Existing Transit Service (Baseline)			
North Mercer Way (WB)	1 [See Note A.]	See below.*	
North Mercer Way (EB)	1 [See Note A.]	See below.*	
80th Avenue SE (SB)	0	0	
Service Characteristics	*Sound Transit and KCM buses utilize bus bays on both sides of North Mercer Way. KCM bus layover operations occur within this area.		36 AM and 39 PM peak hour trips, or one bus every 2 minutes
Limited Service Configuration			
North Mercer Way (WB)	1 [local service only]	0	
North Mercer Way (EB)	1 [same as existing]	Up to 3	
80th Avenue SE (SB)	0	0	
Service Characteristics	50+% reduction in bus volumes relative to existing condition.		12 AM and 12 PM, or one bus every 5 minutes
Improved Service Configuration			
North Mercer Way (WB)	1 [same as existing]	1	
North Mercer Way (EB)	1 [same as existing]	Up to 3	
80th Avenue SE (SB)	0	0	
Service Characteristics	50% reduction in bus volumes relative to existing condition.		16 AM and 16 PM, or one bus every 4 minutes
Optimal Service Configuration			
North Mercer Way (WB)	1 [same as existing]	1	
North Mercer Way (EB)	1 [same as existing]	Up to 3	
80th Avenue SE (SB)	1**	0	
Service Characteristics	50% reduction in bus volumes relative to existing condition. ** 80th Avenue SE pick-up/drop-off transit stop for local Mercer Island bus service only if requested by the City.		Up to 20 AM and up to 20 PM, or one bus every 3 minutes

NOTE

- A. Existing curb space along North Mercer Way is labeled as Bus Bay 1 (WB, north side) and Bus Bay 2 (EB, south side); however, each of these bays are approximately 225 feet in length and can accommodate up to 3 buses at once.

Limited Service Configuration

The **Limited Service Configuration** complies with all modifications in the agreement except the first part of *Section 4.3(b)* related to bus layovers, which, as noted above, would prevent KCM from providing any service to Mercer Island. This configuration would limit bus operations to the south side of North Mercer Way (eastbound), with the exception of local service, which would be allowed to operate along the north side of

North Mercer Way (westbound) within the existing bus curb space. The **Limited Service Configuration** allows for a maximum of only 12 buses per hour serving Mercer Island, less than half of existing service levels and less than half of Metro’s proposed 2025 service levels. For reference, this equates to one bus every five minutes and a maximum of three buses laying over at any given time.

Improved Service Configuration

In addition to the refinement of the layover limits highlighted above, KCM has identified that refinement of *Sections 4.2(a)³/4.3(a)⁴*, permitting bus bays along both eastbound and westbound North Mercer Way to be serviced by all KCM buses, would enable better transit service to Mercer Island. Building upon the Limited Service Configuration, the **Improved Service Configuration** would also include an approximately 145-foot flexible curb space for bus layover operations and to support the existing and potential future innovative mobility options (such as commuter rideshare). The **Improved Service Configuration** allows for approximately 16 buses per hour that could serve this transit interchange, or approximately one bus roughly every four minutes. For reference, this volume of activity is still less than half of today’s frequency; a maximum of four buses could layover at any given time.

Optimal Service Configuration

The **Optimal Service Configuration** builds upon the Improved Service Configuration by adding a preferred pick-up/drop-off stop for local bus service along southbound 80th Avenue SE approximately 100 feet south of the future Mercer Island light rail station’s east entrance; this would require a refinement of the first part of *Section 4.2(a)⁵* and would only be included if requested by the City. This stop (currently envisioned as an in-lane bus stop) would provide additional capacity and flexibility for Metro operations at this transit hub, and provide an ideal location for quick, convenient transfers for passengers between light rail and local bus service. The **Optimal Service Configuration** would allow for up to 20 buses per hour that could serve the new Link station—or one bus every three minutes—still lower than existing bus frequency.

Goals and Objectives Evaluation

Table 2 provides a detailed evaluation on how each of the proposed refinements satisfies the identified goals and objectives; higher scores reflect an anticipated more favorable outcome.

³ The second part of *Section 4.2(a)* states “all bus drop-off/pick-up and layover areas (other than those for local Mercer Island buses) will be located on the south side of North Mercer Way.”













⁴ *Section 4.3(a)* states that “all pick-up/drop-off of passengers will be on the south side of North Mercer Way.”

⁵ The first part of *Section 4.2(a)* states “[T]here will be no bus drop-off/pick-up or layover area on 80th Avenue SE.”

Table 2: Project Goals and Objectives Evaluation



Project Goals and Objectives	Limited Service Configuration	Improved Service Configuration	Optimal Service Configuration
Goal/Objective 1			
<i>Creates a seamless transfer experience for the customer that is intuitive, safe, barrier-free, weather-protected, and efficient</i>	<p>Quick, safe, and intuitive transfers between bus and rail. Limited bus/flexible transit curb space would reduce local and system-wide transfer opportunities, resulting in increased wait times and a less seamless transfer experience.</p>	<p>Additional bus/flexible transit curb space would provide adequate local and system-wide transfers. May require street crossing for connections to light rail station, which is less intuitive, and longer connections are not weather-protected.</p>	<p>Provides greatest amount of bus/flexible transit curb space, allowing for greater transfer opportunities with shortest wait times. Potential bus stop along 80th Avenue SE would provide quick and convenient transfers to local bus service.</p>
Goal/Objective 2			
<i>Minimize transfer walk distance and number of street crossings for bus/rail transfers</i>	<p>Short transfer distance as bus pick-up/drop-off points are along North Mercer Way closest to 80th Avenue SE. Potential street crossing for transfers to local and regional bus service.</p>	<p>Short transfer distance as bus pick-up/drop-off points are along North Mercer Way closest to 80th Avenue SE. Potential street crossing for transfers to local and regional bus service.</p>	<p>Short transfer distance as bus pick-up/drop-off points are along North Mercer Way closest to 80th Avenue SE. Potential street crossing for transfers to local and regional bus service. Potential bus stop along 80th Avenue SE would provide better access to local bus service.</p>
Goal/Objective 3			
<i>Ready for operation when the East Link light rail service begins in 2023</i>	<p>Construction of this option will be complete prior to commencement of East Link light rail service, provided decision made in Q1 2019.</p>	<p>Construction of this option will be complete prior to commencement of East Link light rail service, provided decision made in Q1 2019.</p>	<p>Construction of this option will be complete prior to commencement of East Link light rail service, provided decision made in Q1 2019.</p>
Goal/Objective 4			
<i>A cost-effective design that represents a transparent and appropriate use of public funds</i>	<p>Lowest overall construction costs, but limits the amount of bus transit service and flexibility for future innovative mobility options through the transit interchange.</p>	<p>Construction costs are balanced compared to the level of transit service provided by the additional bus/flexible transit curb space.</p>	<p>Construction costs are balanced compared to the level of transit service provided by the additional bus/flexible transit curb space. Most cost-effective design based on the additional transit service capacities.</p>

Project Goals and Objectives	Limited Service Configuration	Improved Service Configuration	Optimal Service Configuration
Goal/Objective 5			
<i>Maximizes benefits to Mercer Island residents and local employers</i>	 <p>Providing pick-up/drop-off only on the south side of North Mercer Way limits overall ridership benefits to current and future Mercer Island residents and local employers. Major portion of 150 to 175 passenger transit service trips eliminated.</p>	 <p>Provides pick-up and drop-off areas on both the north and south sides of North Mercer Way, providing transit service flexibility and limited service benefits to current and future Mercer Island residents and local employers.</p>	 <p>Provides pick-up and drop-off areas on both the north and south sides of North Mercer Way and in front of light rail station, providing the most transit service flexibility and benefits to current and future Mercer Island residents and local employers.</p>
Goal/Objective 6			
<i>Minimizes potential overall property impacts and local community access impacts and maintains through-vehicular traffic on the 80th Avenue SE bridge crossing</i>	 <p>Roundabout at N Mercer Way and 77th Avenue SE substantially impacts two residential parcels. Through vehicular traffic on 80th Avenue SE will remain.</p>	 <p>Roundabout at N Mercer Way and 77th Avenue SE substantially impacts two residential parcels. Through vehicular traffic on 80th Avenue SE will remain.</p>	 <p>Roundabout at N Mercer Way and 77th Avenue SE substantially impacts two residential parcels. This configuration include the potential for an in-lane bus stop along 80th Avenue SE south of the I-90 EB HOV on-ramp, which may result in minimal impacts to southbound traffic at this location.</p>
Goal/Objective 7			
<i>Provides excellent multi-modal access for customers while minimizing general pedestrian, bicycle, and vehicle mobility impacts near bus drop-off locations</i>	 <p>Fewer pick-up/drop-off and layover bays reduces potential mobility impact points but also reduce potential multi-modal access opportunities.</p>	 <p>Proposed bus/flexible transit curb space provide opportunities for increased multi-modal accessibility and for future innovative mobility options. Expected activity on the north side of North Mercer Way would result in additional pedestrian, bicycle, and vehicle interaction points.</p>	 <p>Proposed bus/flexible transit curb space in this configuration provide the greatest opportunity for multi-modal access and future innovative mobility options. Expected activity on the north side of North Mercer Way would result in additional pedestrian, bicycle, and vehicle interaction points.</p>
Goal/Objective 8			
<i>Limits diesel idling and limits regional bus circulation through the Town Center</i>	 <p>KCM buses do not idle during layover. Future buses will be all electric. Roundabout eliminates regional bus circulation through the Town Center.</p>	 <p>KCM buses do not idle during layover. Future buses will be all electric. Roundabout eliminates regional bus circulation through the Town Center.</p>	 <p>KCM buses do not idle during layover. Future buses will be all electric. Roundabout eliminates regional bus circulation through the Town Center.</p>
Total Score (Higher Is Better)	24	28	33

Conclusion and Recommendation

All three of the proposed configurations were developed with the intent of providing a bus/rail interchange that satisfies the Settlement Agreement. Importantly, each configuration will result in lower bus volumes than the numbers operating today, an acknowledgement of the City's stated desire to limit regional transit service on Mercer Island. All three design options include a new roundabout at North Mercer Way and 77th Avenue SE, and anticipated bus circulation patterns are identical. The differences are most pronounced in terms of the quality of bus transit service that Sound Transit and KCM are capable of providing the current and future Mercer Island residents, employees, and businesses, and the entire region.

The **Limited Service Configuration** received the lowest score, due to its small footprint that would ultimately result in the least pleasant transfer experience, with the few bus stops and minimal flexible transit curb space resulting in longer wait times. KCM would not be able to provide adequate local Mercer Island bus service with this configuration, resulting in loss of service to the current 150 to 175 daily bus passenger trips between Mercer Island and eastside communities. In addition, less ability to connect between bus and rail along the East Link will likely result in more customers from the greater Eastside and I-90 corridor driving to Mercer Island to park. Based on the foregoing, this configuration does not meet Metro's current or future operational needs.

The **Improved Service Configuration** received the intermediate score. The layout of transit curb space is most similar to the current condition, effectively creating active spaces between the Mercer Island P&R, bus transfer points along North Mercer Way, and the future light rail station. This configuration would include additional layover/flexible transit space when compared with the Limited Service Configuration, comparatively ranking higher for goals and objectives relating to seamless transfer experience, cost-effective design, and maximum benefit to current and future Mercer Island residents and employers.

The **Optimal Service Configuration**, which received the highest score expands on the Improved Service Configuration by adding bus/transit curb space approximately 100 feet south of the future east entrance to the light rail station along 80th Avenue SE. This additional bus bay/stop allows for the potential for seamless transfers for local bus service, shorter transfer distance, reduced walking distances to the Town Center, reduced impacts to vehicles accessing the I-90 HOV lanes, and maximizes benefits to the Mercer Island community by providing space for future service changes and opportunities for innovative mobility options. In sum, the **Optimal Service Configuration** provides the best transit benefits in terms of: flexibility for future mobility options; immediacy of transfer experience; and transfer reliability and best meets Sound Transit's and KCM's current and future operational needs.

As such, the **Optimal Service Configuration** is the recommended path forward in implementing the Settlement Agreement as this configuration includes refinements which satisfy joint goals and objectives to the highest degree and represents the best design in fulfilling the intent of the bus/rail integration section of the Settlement Agreement while best meeting Sound Transit's and Metro's current and future operational needs.