

Appendix B
RapidRide Roosevelt Project
Supplemental Transportation
Technical Report

[This page left intentionally blank]

RAPIDRIDE ROOSEVELT PROJECT SUPPLEMENTAL TRANSPORTATION TECHNICAL REPORT

Prepared for

Seattle Department of Transportation



Seattle
Department of
Transportation

September 2021

This page intentionally left blank.

EXECUTIVE SUMMARY

Introduction

This Executive Summary highlights the transportation effects associated with the U District Option (also called the Build Alternative in this report) on the transportation system. A broad set of transportation elements were analyzed to compare the U District Option to the No Build Alternative condition.

The U District Option would provide increased service frequency over existing transit service in the corridor and would extend the span of service to 24 hours per day. Buses would run at 7.5-minute headways or better during peak periods, and at 10-minute headways during midday and until 10 PM on weekdays. Weekend headways would range from 10 to 15 minutes. Overnight service would be provided 7 days per week.

The U District Option would have minor new operational transportation impacts and benefits compared to those discussed in the RapidRide Roosevelt Environmental Assessment (“January 2020 EA”) (SDOT, 2020). There would be no additional construction impacts from those discussed in the January 2020 EA.

Impact Summary

The following transportation elements were analyzed in this Transportation Technical Report:

- Transit
- Arterial and Local Streets
- Pedestrians and Bicyclists
- Parking
- Safety
- Freight

These elements were analyzed to compare the U District Option to the No Build Alternative. Two transportation elements, Safety and Freight, were determined to have no substantial impacts or changes due to the U District Option and are therefore not discussed in this summary.

Regional Traffic and Roadways was a transportation element assessed in the January 2020 EA but is not included in the Supplemental EA because the U District Option is not expected to affect regional traffic and the regional roadway system. Similarly, this Transportation Technical Report does not include data applicable to the screenlines documented in the January 2020 EA because those are located outside the U District Option study area.

Transit

The U District Option would improve transit travel times and reliability within the University District. The U District Option includes several transit improvements that would benefit transit travel time and reliability in the University District, including:

- A new signal at Roosevelt Way NE and NE 43rd St with transit signal priority (TSP) and/or adaptive control technology

- Operational improvements at stations, including all-door boarding
- Protected bicycle lanes (PBLs) on NE 43rd St, reducing interactions between buses and bicycles
- Optimization of stop spacing (which may include consolidation of stops) between each transit stop pair

Besides the transit improvements, the U District Option would travel about a 1/3 of a mile less to complete its northern turnaround trip (approximately 1-1/3 miles) compared to Route 70 in the No Build Alternative (approximately 1-2/3 miles) and would travel through eight fewer traffic signals. Route 70 would travel through 19 signalized intersections in the University District while the U District Option would travel through 11 signalized intersections. Therefore, the travel times in the University District are estimated to provide between a 2- to 4-minute in-vehicle travel time savings, depending on direction.

With the increased transit service hours, more frequent service, travel time savings, and improved reliability, transit ridership in this corridor is expected to increase with the U District Option. In the future No Build condition, which reflects Sound Transit light rail service to Northgate, the ridership on King County Metro (KCM) Route 70 would be 3,800 in year 2026 and 4,800 by 2040. The daily boardings on the U District Option would be 10,500 in year 2026 and up to 14,300 by year 2040. This represents between a 177 to 198 percent increase in ridership over the No Build Alternative.

Arterial and Local Streets

The U District Option would not modify roadway operations along 12th Ave NE, NE 45th St, and 15th Ave NE from the operations of the No Build Alternative. Additionally, the U District Option would not impact vehicle circulation or property access from the No Build Alternative.

The U District Option proposes minor changes to the roadway system, and the intersection level of service (LOS) is similar between the No Build and Build alternatives. With the U District Option, no intersections would operate at LOS F and with worse delay than the No Build Alternative. Because the Build Alternative does not propose substantial roadway modifications and would have similar intersection LOS operations, general purpose travel time in the University District is expected to be similar between the No Build and Build alternatives.

Pedestrians and Bicyclists

In the Build Alternative, the U District Option would further improve pedestrian access and conditions. New and upgraded stations would be designed to meet Americans with Disabilities Act (ADA), *Seattle Right-of-Way Improvements Manual* (City of Seattle, 2017), and *King County Metro Transit Passenger Facilities Improvements Standard Details* (KCM, 2011) standards; typical station platform widths would be 8 to 10 feet. All existing pedestrian crossing movements would be maintained with the U District Option and an estimated six existing curb ramps would be replaced at the Roosevelt Way NE/NE 43rd St intersection.

The U District Option would also improve the bicycle conditions by adding one block (approximately 250 feet) of new PBLs along both sides of NE 43rd St between Roosevelt Way NE and 11th Ave NE in addition to the section of the PBL on 11th Ave NE, as identified in the January 2020 EA, from the University Bridge to NE 43rd St. These bike lanes would improve the

bicycle network by creating a continuous connection between the University of Washington, Sound Transit's U District Station, and the 11th Ave NE/Roosevelt Way NE couplet, providing a regional connection across the University Bridge and through Eastlake, South Lake Union and Downtown. No bicycle facilities would be removed or substantively modified by the U District Option.

Parking

In addition to the parking impacts described in the January 2020 EA, the U District Option would remove one passenger load zone, between approximately eight and eleven on-street parking spaces (depending on the time of day), and one shuttle load zone to install the PBLs on NE 43rd St between 11th Ave NE and Roosevelt Way NE. Otherwise, no additional on-street parking would be affected under the Build Alternative from what was described in the January 2020 EA.

Safety

Under the U District Option, vehicular and nonmotorized safety is likely to improve or remain similar along streets that would be modified. Overall, the bus route under the U District Option would be about a 1/3 of a mile less, have fewer signals to travel through and have less conflicts with other travel modes than Route 70's bus route. New crosswalks, ADA curb ramps, and the proposed traffic signal at Roosevelt Way NE and NE 43rd St would improve pedestrian and cyclist safety. The U District Option would also provide cyclists PBLs that complete the connection between the University of Washington, Sound Transit's U District Station, and the couplet of the southbound PBL along Roosevelt Way NE and the northbound PBL along 11th Ave NE.

Freight

The City of Seattle has designated Roosevelt Way NE, 11th Ave NE, and NE 45th St as Minor Truck streets in the U District Option study area. No other streets have a truck designation in the study area. The U District Option does not propose substantial roadway channelization or street modifications that would impact freight operations. Additionally, the future intersections level of service under the U District Option is similar compared to the No Build Alternative; therefore, freight operations are not expected to be affected by the U District Option.

Construction Impacts

The total construction duration of the U District Option would be approximately 36 months, depending on how it is staged and phased¹.

Overall, the January 2020 EA noted that the RapidRide Roosevelt Project would result in short-term construction impacts along the corridor. The U District Option would have similar

¹ Potential water utility and paving work in the Eastlake Neighborhood associated with the U District Option will be coordinated with Seattle Public Utilities. This would include potential Seattle Public Utilities-led water utility improvements on Eastlake Avenue that may be constructed as a separate or concurrent project. This water utility and paving effort would extend the construction schedule for the U District Option (which was previously planned for 24 months) to approximately 36 months in the Eastlake Neighborhood only; construction duration for the U District Option outside of the Eastlake Neighborhood would remain at approximately 24 months and would likely be conducted in phased work zones to minimize impacts.

construction impacts to those described in the January 2020 EA (SDOT, 2020). Construction is planned to be limited to the existing right-of-way but may require temporary construction easements. In general, one lane of traffic adjacent to the station would be temporarily closed. For some work elements, such as traffic signal work, overhead contact system (OCS) pole and wiring installation, paving, and utility work, portions of streets may need to be closed for short periods, including potentially a full closure of NE 43rd St where paving is proposed. To the extent feasible, these activities would be scheduled during non-peak traffic periods. Signal improvements would also require temporary signal deactivation. During construction, work zone traffic control measures would help to ensure vehicles are able to navigate safely through or around construction areas. To the extent feasible, access to adjacent properties would be maintained along the corridor.

Lane closures in the University District would affect transit service, including temporary stop closures and delays to buses from congestion. It is expected that the transit routes would continue along their routes and not require detours. At existing stops that will be upgraded to RapidRide stations, construction would require temporary relocation of the stop.

Station construction would generally require the closure of the surrounding sidewalk near that station. At intersections where construction work would take place, one or more crossing movements could be temporarily closed. In these conditions, pedestrians would need to use an adjacent crossing or cross the street using the other intersection crossings.

Bicycles would be required to detour from bicycle lanes to general purpose travel lanes where those facilities overlap with station, OCS, and signal construction work, such as along NE 43rd St. Cyclists continuing to ride on the corridor may need to ride over disturbed asphalt or steel plates, and in lanes with general purpose traffic. Alternatively, they would have the option of using parallel streets in the University District neighborhood include designated neighborhood greenways and signed bicycle routes.

Most of the U District Option construction activities would likely temporarily restrict parking along the street segment being constructed. Parking along the cross-streets or on parallel streets is less likely to be affected by construction. The loss of parking would only be temporary for the duration of the construction. Various load zones would also be removed where on-street parking is removed during construction and temporarily relocated where feasible.

Potential Mitigation Measures

Operation (Parking)

SDOT will relocate the impacted NE 43rd St passenger load zone and shuttle load zone nearby, where feasible, to facilitate passenger pick-up and drop off for nearby buildings. Otherwise, no additional mitigation beyond what was proposed in the January 2020 EA is required for the loss of parking associated with the U District Option.

Construction

No mitigation is proposed for construction transportation impacts beyond what was proposed in the January 2020 EA. Prior to construction of the U District Option, SDOT will finalize detailed construction plans during final design. All mitigation associated with constructing the U District

Option will comply with SDOT-approved/coordinated traffic control plans and, if required, a construction management plan and haul-route plan.

This page intentionally left blank.

TABLE OF CONTENTS

Executive Summary	i
Introduction.....	i
Impact Summary	i
Transit.....	i
Arterial and Local Streets	ii
Pedestrians and Bicyclists	ii
Parking	iii
Safety.....	iii
Freight.....	iii
Construction Impacts.....	iii
Potential Mitigation Measures.....	iv
Operation (Parking).....	iv
Construction.....	iv
Table of Contents	vii
Acronyms and Abbreviations	xi
1.0 Introduction	1-1
1.1 Background	1-1
1.2 Project Description	1-2
1.2.1 No Build Alternative	1-2
1.2.2 U District Option (Build Alternative)	1-3
2.0 Methodology and Assumptions	2-1
2.1 Evaluation Measures	2-1
2.2 Study Area	2-2
3.0 Environmental Consequences	3-1
3.1 Transit.....	3-1
3.1.1 Service Patterns	3-1
3.1.2 Service Levels.....	3-2
3.1.3 Ridership.....	3-3
3.1.4 Passenger Loads.....	3-4
3.1.5 Station Capacity.....	3-4
3.1.6 Travel Times	3-5
3.1.7 Reliability.....	3-6
3.1.8 Layover Areas	3-7
3.2 Arterial and Local Streets	3-7
3.2.1 Roadway System	3-7
3.2.2 Traffic Forecasts.....	3-8
3.2.3 Intersection Level of Service	3-8
3.2.4 General Purpose Travel Times.....	3-11
3.2.5 Property Access and Circulation.....	3-11
3.3 Pedestrians and Bicyclists	3-11

3.3.1	Pedestrian System.....	3-11
3.3.2	Sidewalk Maintenance Condition	3-12
3.3.3	Intersection Treatments.....	3-12
3.3.4	Pedestrian Volumes.....	3-12
3.3.5	Bicycle Facilities.....	3-12
3.3.6	Bicycle Volumes.....	3-13
3.4	Parking	3-13
3.4.1	On-street Parking Inventory and Loading Zone Changes.....	3-13
3.5	Safety.....	3-14
3.5.1	Vehicular Collisions	3-14
3.5.2	Pedestrian and Bicycle Collisions	3-15
3.6	Freight.....	3-15
3.6.1	Freight Operations.....	3-15
3.6.2	Freight Access.....	3-16
4.0	Construction	4-1
4.1	Construction Scope and Activities.....	4-1
4.2	Construction Duration and Phasing	4-1
4.3	Construction Impacts.....	4-2
5.0	Potential Mitigation Measures	5-1
5.1	Parking	5-1
5.2	Construction.....	5-1
6.0	Indirect Impacts.....	6-1
7.0	Cumulative Impacts	7-1
7.1	Parking	7-1
7.2	General Population and Employment Growth.....	7-1
7.3	Construction.....	7-1
8.0	References.....	8-1

Tables

Table 2-1.	Transportation Measures.....	2-1
Table 2-2.	Study Area Intersections	2-4
Table 3-1.	No Build and Build Projected Daily and Annual Project Corridor Ridership (U District Option)	3-3
Table 3-2.	Projected Daily Boardings by Station (U District Option Only)	3-4
Table 3-3.	Transit In-Vehicle Travel Times, PM Peak	3-6
Table 3-4.	PM Peak Hour Intersection Level of Service Change between No Build and Build Conditions (2026) Alternatives	3-9
Table 3-5.	PM Peak Hour Intersection Level of Service Change between No Build and Build Conditions (2040)	3-10
Table 3-6.	Summary of Change in Future RapidRide Roosevelt Alignment with the U District Option On-Street Parking Inventory by Type.....	3-14

Figures

Figure 1-1. RapidRide Roosevelt Alignment with U District Option.....1-5
Figure 2-1. U District Option Study Area and Build and No Build Alternatives2-3
Figure 2-2. Traffic Analysis Study Area Intersections2-5

Attachment

Attachment 1. U District Option No Build and Build Transit Assumptions

This page intentionally left blank.

ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
BAT	business access and transit
EA	Environmental Assessment
KCM	King County Metro
LOS	level of service
OCS	overhead contact system
PBL	protected bicycle lane
SDOT	Seattle Department of Transportation
TSP	transit signal priority

This page intentionally left blank.

1.0 INTRODUCTION

1.1 Background

This technical report presents a transportation study for the U District Option being proposed by the Seattle Department of Transportation (SDOT). The RapidRide Roosevelt Project studied in the January 2020 *RapidRide Roosevelt Project Environmental Assessment* ("January 2020 EA") has a southern terminus in Downtown Seattle and a proposed northern terminus at NE 67th St near Sound Transit's Roosevelt Light Rail Station. The U District Option, instead of continuing northward to NE 67th St, has a proposed northern terminus in the University District that would encircle Sound Transit's U District Station, and a southern terminus in Downtown Seattle. Between Downtown Seattle and the University Bridge the U District Option is unchanged from the RapidRide Roosevelt Project as described in the January 2020 EA. The U District Option north of the University Bridge would have different elements to those studied in the January 2020 EA; as such, the preparation of this supplemental technical report is necessary to identify any potentially new transportation impacts associated with the U District Option.

The U District Option would provide electric bus rapid transit service between Downtown Seattle and the University District neighborhood, while serving the Belltown, South Lake Union, and Eastlake neighborhoods. The U District Option corridor is approximately 5 miles long. Buses would operate in their own lane or in mixed traffic within existing rights-of-way.

The U District Option purpose is to improve transit capacity, travel time, reliability, connectivity, comfort, visibility, and legibility in the corridor, while also making related improvements for people walking and bicycling. In so doing, the U District Option would improve overall access and mobility in a rapidly growing urban corridor, providing new and enhanced connections to major employment nodes, residential areas, schools, and businesses. The U District Option would include numerous transit priority treatments to improve speed, reliability, capacity, and the passenger experience.

The U District Option would provide increased service frequency over existing transit service in the corridor and would extend the span of service to operate 24 hours per day. Buses would run at 7.5-minute headways or better during peak periods, and at 10-minute headways during midday and until 10 PM on weekdays. Weekend headways would range from 10 to 15 minutes. Nighttime hourly service would be provided 7 days per week from 1 AM to 5 AM.

This *Transportation Technical Report* evaluates the future transportation impacts and potential mitigation associated with the proposed U District Option within the study area. The future years are 2026 (the projected year of opening of the U District Option) and 2040 (the planning horizon). A brief overview of the study methodology is presented in Section 2. Section 3 discusses environmental consequences (future conditions) of operation of the U District Option. Section 4 discusses construction impacts. Section 5 describes potential mitigation measures. Sections 6 and 7 discuss indirect and cumulative impacts.

An Affected Environment (existing conditions) is not provided in this Supplemental Environmental Assessment because the Affected Environment described in the *RapidRide Roosevelt Project Environmental Assessment* (SDOT, 2020) already describes existing conditions.

See Section 4 of the Transportation Technical Report of the January 2020 EA (SDOT, 2020) for the existing transportation conditions.

1.2 Project Description

Two alternatives were evaluated in this transportation analysis for the *RapidRide Roosevelt Project Supplemental Transportation Technical Report*: a No Build Alternative and a Build Alternative. These alternatives are summarized below.

1.2.1 No Build Alternative

The No Build Alternative assumes the U District Option would not be constructed and King County Metro (KCM) Route 70 would continue to operate. The U District Option is expected to be open by year 2026 with a horizon year of 2040, which is consistent with local and regional planning. Therefore, the No Build Alternative includes all reasonably foreseeable transportation projects assumed to be completed by years 2026 and 2040. Within the U District Option study area, the projects built by 2026 include:

- Sound Transit Northgate Link Extension – Northgate Link will begin service in 2021, providing high-capacity rail transit north to Northgate and south to Angle Lake, including construction of Sound Transit’s U District Station and associated road restoration. The Northgate Link Extension will be followed by the Lynnwood Link Extension in 2024 and the Everett Link Extension in 2036, both of which will extend the line farther northward. Other Link extensions are being constructed or planned by Sound Transit prior to the 2040 horizon year to the cities of Redmond, Federal Way, Tacoma as well as to West Seattle and Ballard neighborhoods. Those light rail extensions do not directly affect the conditions within the University District study area.
- KCM North Link Connections Mobility Project – In conjunction with the Northgate Link Extension, KCM is implementing the North Link Connections Mobility Project with planned bus service changes scheduled in 2021. The project would revise the bus network to integrate with the light rail system, including revisions to Route 70 which would be rerouted to serve and terminate at Sound Transit’s U District Station via NE 43rd St, laying over along 12th Ave NE.
- Community Transit Service Revisions – Community Transit also plans to revise its routes in its service area to integrate with the Northgate Link Extension, including truncating its express routes that currently run to the University District and instead focus on delivering Seattle-bound passengers to local light rail stations in Snohomish County.
- Seattle Department of Transportation (SDOT) Route 44 Transit-Plus Multimodal Corridor Project – In addition to the bus service changes associated with the light rail extensions, SDOT is proposing various speed and reliability treatments along NE 45th St and 15th Ave NE. These improvements include an eastbound business access and transit (BAT) lane along NE 45th St between Roosevelt Way NE and 15th Ave NE, and BAT lanes on sections of 15th Ave NE between NE 45th St and NE Pacific St.
- SDOT 12th Ave NE and NE 43rd St Paving Project – Within the study area, this project will repave portions of 12th Ave NE and NE 43rd St, add bus layover on the east side of

12th Ave NE between NE 43rd St and NE 45th St, install protected bicycle lanes (PBLs) on NE 43rd St between Brooklyn Ave NE and 11th Ave NE, and replace some sidewalks and non-Americans with Disabilities Act (ADA) compliant curb ramps within the project area.

- SDOT NE 43rd St Improvements Project – On NE 43rd St between 15th Ave NE and Brooklyn Ave NE, this project will improve the pedestrian realm with wider sidewalks and a curbless design, install a PBL on the south side of the street, and convert this portion of NE 43rd St to westbound one-way operation. NE 43rd St between University Way NE and Brooklyn Ave NE would be restricted to buses and bicycles.
- SDOT University of Washington Subarea Multimodal Integrated Corridor Mobility for All (MICMA) – MICMA will install adaptive signal technology at intersections throughout the study area with the capability to provide transit signal priority, among other features.

Projects under the No Build Alternative will change the transportation conditions for most modes in the University District area, including transit service, roadway operations and the non-motorized environment.

1.2.2 U District Option (Build Alternative)

As shown on Figure 1-1, the U District Option would include all of the RapidRide Roosevelt Project elements south of the University Bridge as presented in the January 2020 EA. The northern turnaround for the U District Option (see inset box on Figure 1-1), would encircle the Sound Transit U District Station along NE 43rd St, 12th Ave NE, NE 45th St, and 15th Ave NE, and would include the following elements north of the University Bridge:

- Up to four new RapidRide stations to support connections to Sound Transit’s U District Station and facilitate other transit connections in the vicinity.
- Full-depth concrete paving, protected bicycle lanes (PBLs), and overhead contact system (OCS) along NE 43rd St between Roosevelt Way NE and 12th Ave NE.
- New signal with adaptive signal control technology and/or transit signal priority (TSP) at the Roosevelt Way NE/NE 43rd St intersection.

Americans with Disabilities Act (ADA)-compliant curb ramp and sidewalk upgrades, signing, and channelization.

Layover for the U District Option would occur along 12th Ave NE between NE 43rd St and NE 45th St. This layover is being developed in collaboration with KCM to support planned service revisions associated with the opening of Sound Transit’s U District Station and would be in place prior to the U District Option opening.

The U District Option would use the existing OCS along NE 45th St and 15th Ave NE. Installation of OCS along 12th Ave NE and on NE 43rd St between 12th Ave NE and 15th Ave NE is being constructed to support planned service revisions associated with the opening of Sound Transit’s U District Station and would be in place prior to the U District Option opening. New OCS would be required for the U District Option route along NE 43rd St between Roosevelt Way NE and 12th Ave NE, in addition to the OCS described in the January 2020 EA along 11th Ave NE and Roosevelt Way NE north of the University Bridge.

Construction is planned to be limited to existing right-of-way but may require temporary construction easements. Construction could affect on-street parking and require temporary closure of travel lanes. Temporary sidewalk closures with signage noting detour routes could be necessary when constructing around stations and installing utilities or OCS poles. Construction staging would be within the existing roadway right-of-way where construction is occurring, and additional areas required for staging outside of existing right-of-way would be identified during final design. Construction would begin as early as 2022 with substantial completion of construction by 2025 and service opening in 2026.

RapidRide Roosevelt Project elements north of NE 43rd St would not be included in the U District Option; however, SDOT may choose to proceed separately with certain elements of the RapidRide Roosevelt Project (such as paving and channelization revisions) north of NE 43rd St, depending upon funding availability.

This page intentionally left blank.

2.0 METHODOLOGY AND ASSUMPTIONS

The study area of the transportation analysis as part of the U District Option is shown in Figure 2-1. Measures for assessing the transportation elements in the study area (Table 2-1) are both quantitative and qualitative. These measures are organized in this technical report by their respective transportation element.

An existing conditions section is not included in the Transportation Technical Report as there are multiple transportation projects in the University District currently in construction that affect the existing transportation conditions. Because those projects are expected to be completed by the U District Option’s year of opening in 2026, the future transportation analysis as part of the No Build Alternative provides a more contextually-appropriate baseline of the transportation conditions in the University District area and comparison to the Build Alternative. See the January EA (SDOT, 2020) for information on the Affected Environment conditions.

2.1 Evaluation Measures

Table 2-1 provides a summary of the evaluation measures included in the transportation analysis, organized by transportation element.

Regional Traffic and Roadways was a transportation element assessed in the January 2020 EA (SDOT, 2020) but is not included in this Transportation Technical Report because the U District Option is not expected to affect regional traffic and the roadway system. Similarly, this report does not include data at the screenlines documented in the January 2020 EA because those were located outside the U District Option study area and are not included in this document.

Table 2-1. Transportation Measures

TRANSPORTATION ELEMENT	MEASURES
Transit	Service patterns Service levels U District Option and station-level ridership (daily, annual) Passenger loads Station capacity Travel times Reliability Layover
	Roadway system Traffic forecasts Intersection level of service General purpose traffic travel times Property access and circulation
Pedestrians and Bicyclists	
Parking	Occupancy Supply impacts

Table 2-1. Transportation Measures

TRANSPORTATION ELEMENT	MEASURES
Safety	Collisions Safety impacts
Freight	Impacts to truck streets Operations and access
Construction (for all Transportation Elements)	Qualitative assessment of construction impacts
Indirect Impacts	Qualitative assessment of changes to mobility and access due to project-related land use changes
Cumulative Impacts	Qualitative assessment of the incremental impacts of all the U District Option effects

Some measures that were calculated for the January 2020 EA (SDOT, 2020) are not included in this Supplemental Transportation Technical Report. Measures were omitted if they present data for screenlines that are outside of the U District Option study area, and/or if no impacts were expected for the U District Option. The following measures were omitted from the Supplemental EA:

- Regional roadway volumes
- Vehicle miles traveled (VMT)
- Annual and daily transit system trips
- Annual transit system boardings
- Vehicle/person throughput and mode share

In the January 2020 EA, (SDOT, 2020) the transportation analysis was prepared for a 2024 opening year. The U District Option is now expected to have substantial construction completed by 2025 with a service opening in 2026. For the purposes of the transportation analysis, the forecasts used in the January 2020 EA (SDOT, 2020) is appropriate for this report as it continues to provide an appropriate comparison of the No Build and Build Alternatives. The transportation data and forecasts between these years is not considered to be substantial to adjust the results or conclusions, in part due to no foreseeable transportation projects planned within the U District Option study area to be built between 2024 and 2026 that would substantially affect the transportation analysis.

2.2 Study Area

Figure 2-1 shows the U District Option study area for the transportation technical analyses. This study area was selected so the analysis in Section 3 can be developed to determine benefits and impacts of the U District Option. The study area includes the streets that comprise the proposed U District Option and adjacent streets and study area intersections.



Figure 2-1. U District Option Study Area and Build and No Build Alternatives

Table 2-2 lists the study area intersections included in the analysis and their reference numbers, which are illustrated on Figure 2-2. Reference numbers were assigned to maintain consistency with the numbering system used in the January 2020 EA (SDOT, 2020).

Table 2-2. Study Area Intersections

REFERENCE NUMBER	INTERSECTION
111	Roosevelt Way NE/NE 45th St
112	11th Ave NE/NE 45th St
113	11th Ave NE/NE 43rd St
114	Roosevelt Way NE/NE 42nd St (East Leg)
115	11th Ave NE/NE 42nd St
116	Roosevelt Way NE/NE 42nd St (West Leg)
169	12th Ave NE/NE 45th St
170	Brooklyn Ave NE/NE 45th St
171	University Way NE/NE 45th St
172	15th Ave NE/NE 45th St
173	Roosevelt Way NE/NE 43rd St (East Leg)
174	12th Ave NE/NE 43rd St
175	Brooklyn Ave NE/NE 43rd St
176	University Way NE/NE 43rd St
179	15th Ave NE/NE 43rd St
180	Roosevelt Way NE/NE 43rd St (West Leg)
184	15th Ave NE/NE 42nd St

Note: Reference numbers are provided for the purpose of locating the intersections on the corresponding Figure 2-2.

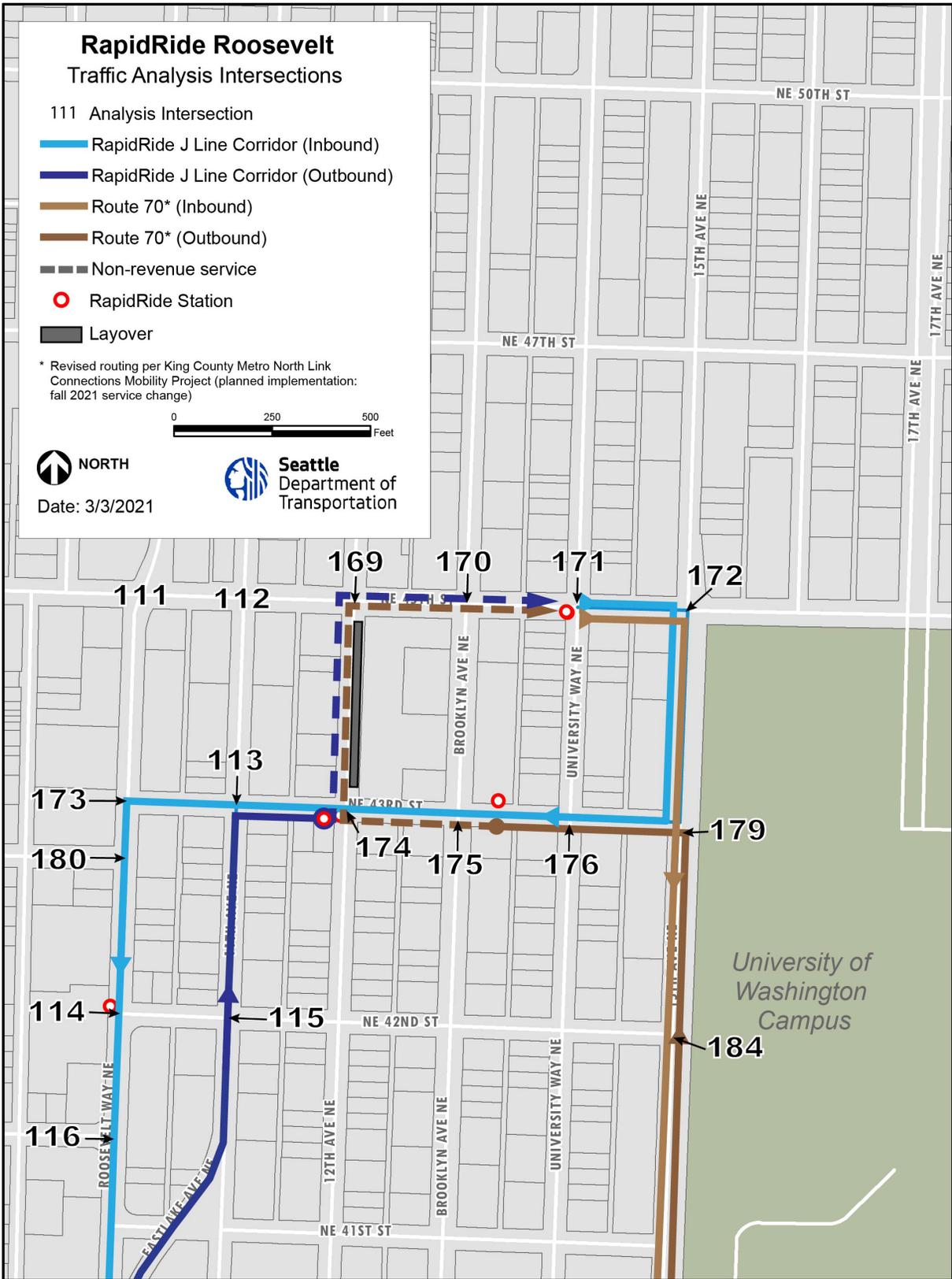


Figure 2-2. Traffic Analysis Study Area Intersections

This page intentionally left blank.

3.0 ENVIRONMENTAL CONSEQUENCES

This section of the Transportation Technical Report describes the Environmental Consequences (also called future conditions) of the transportation elements for the U District Option. This section compares the No Build and Build alternatives for the year of opening (2026) and horizon year (2040). The transportation elements include:

- Transit Arterial and Local Streets
- Pedestrians and Bicyclists
- Parking
- Safety
- Freight

Based on the study area for the U District Option, it was determined that there would be no substantial change to the regional traffic and roadways conditions as documented in the January 2020 EA (SDOT, 2020).

3.1 Transit

3.1.1 Service Patterns

There are several proposed changes to the transit network in the University District reflected in the No Build Alternative (see Section 1.2.1, No Build Alternative). The U District Option would build on those enhancements with the following changes.

For a complete list of No Build transit service assumptions, see Attachment 1, No Build and Build Transit Assumptions.

Transit Stops

Some changes are expected to the locations of transit stops in the study area under the No Build condition to accommodate the route revisions proposed as part of KCM's North Link Connections Mobility Project. Relevant to the U District Option, KCM will provide a new bus stop at Sound Transit's U District Station along NE 43rd St. This stop would be used by Routes 49 and 70 as well as other services. Additionally, Route 70 inbound (southbound) would now stop at the existing NE 45th St and University Way NE bus stop.

Under the Build condition, the U District Option would install or upgrade four bus stops/stations in the study area, shown on Figure 2-1. The stations are:

- NE 43rd St and 12th Ave NE – final outbound (northbound) stop. Alightings only, no boardings.
- NE 45th St and University Way NE – first inbound (southbound) stop. An existing stop that serves multiple routes.
- NE 43rd St at Sound Transit's U District Station – inbound (southbound) stop also serving multiple routes. Station would include RapidRide amenities.

- NE 42nd St and Roosevelt Way NE – inbound (southbound) station location revised from the RapidRide Roosevelt Project as previously described in the January 2020 EA. Currently an existing stop serving multiple routes. Station would include RapidRide amenities.

Stations along Roosevelt Way NE and 11th Ave NE at NE Campus Parkway and to the south of the University Bridge would be the same as described in the January 2020 EA (SDOT, 2020).

The stations at Roosevelt Way NE and NE 42nd St and at Sound Transit’s U District Station at NE 43rd St would include RapidRide station amenities such as shelter, real-time arrival information, pedestrian-scale lighting, seating, and waste receptacles. The inbound station on NE 45th St at University Way NE is an existing stop serving multiple routes; this may be enhanced with station amenities, possibly using an awning from the adjacent building rather than a freestanding shelter. The last outbound stop at 12th Ave NE and NE 43rd St would only serve alighting passengers. Therefore, RapidRide station amenities would not be constructed there, and instead the stop would be indicated by a standard KCM post and sign. Wayfinding signage may also be provided.

The Route 70 would be deleted concurrent with the opening of the U District Option. KCM’s METRO CONNECTS long-range service plan envisions other routes continuing to run along its current and revised No Build alignments, and so it is anticipated that most of the Route 70 stops would continue to be in service with the U District Option. At present METRO CONNECTS does not envision service at the outbound stop on NE Campus Parkway between Brooklyn Ave NE and University Way NE, so in the absence of the Route 70 it is possible KCM would delete this stop.

Transit Service

The U District Option would serve the University District area and circulate around Sound Transit’s U District Station. The U District Option would replace Route 70 and would have northbound (outbound) service along 11th Ave NE then turn onto NE 43rd St. Northbound service would terminate at NE 43rd St and 12th Ave NE with layover along 12th Ave NE. This layover would be the same location as what is being proposed in the No Build Alternative as part of KCM’s North Link Connections Mobility Project. Inbound (southbound) service under the U District Option would begin eastbound on NE 45th St, turn southbound onto 15th Ave NE and turn onto NE 43rd St and head west until Roosevelt Way NE where it would turn south and continue along the route described in the January 2020 EA (SDOT, 2020).

Segments of the inbound (southbound) route that travel along NE 45th St and 15th Ave NE would run in BAT lanes; constructed in the No Build Alternative as part of Route 44 service improvements (see Section 1.2.1). See Figure 2-1 for the U District Option. No other transit service changes are proposed as part of the Build Alternative.

3.1.2 Service Levels

No changes to the No Build or Build alternatives bus frequencies or span of service are proposed from what is documented in the January 2020 EA (SDOT, 2020).

3.1.3 Ridership

The U District Option is expected to increase transit ridership along the corridor. Ridership forecasts for the U District Option were prepared using the Federal Transit Administration STOPS model, which includes the transit system as part of King, Kitsap, Pierce, and Snohomish counties. Therefore, this model produces forecasts both for the U District Option specifically and for the regional transit system.

Based on Federal Transit Administration guidelines, the STOPS model produces a transit forecast for a future horizon year of 2035. The 2035 forecast was performed for the U District Option and is used as the 2040 condition. This serves as a conservative approach because land use and transit ridership are expected to increase between 2035 and 2040. See the January 2020 EA (SDOT, 2020) for further information on the transit ridership forecasting process, input assumptions and industry best practices to produce reasonable estimates given current information and trends.

U District Option Corridor

Daily and annual boardings for the No Build and Build alternatives are presented in Table 3-1. Route 70 serves as the proxy for the No Build condition. Under the Build Alternative, with the U District Option replacing Route 70, due to the increased transit service hours, more frequent service, travel time savings, and improved reliability, transit ridership in this corridor is expected to increase with the U District Option, as shown in Table 3-1. In the future No Build condition, which reflects Sound Transit light rail service to Northgate, the ridership on Route 70 would be 3,800 in year 2026 and 4,800 by 2040. The ridership with the U District Option would be 10,500 in year 2026 and up to 14,300 by year 2040. This represents a 177 percent to 198 percent increase in ridership over the No Build condition.

Boardings shown are for all of the proposed stops within the corridor, which includes the full length of the U District Option from Sound Transit's U District Station in the north to Pioneer Square in the south.

Table 3-1. No Build and U District Option Projected Daily and Annual Ridership

ALTERNATIVE	OPENING YEAR (2026)	HORIZON YEAR (2040)
<i>No Build</i>		
Daily Boardings – Route 70	3,800	4,800
Annual Boardings – Route 70	1,168,000	1,485,000
<i>U District Option</i>		
Daily Boardings	10,500 (+6,700, +177%)	14,300 (+9,500, +198%)
Annual Boardings	3,232,000 (+2,064,000, +177%)	4,421,000 (+2,936,000, +198%)

Note:

1. Due to rounding, some totals may not equal the sum of values shown.
2. In the January 2020 EA, Route 67 was included in the ridership comparison due to the overlapping service with the RapidRide Roosevelt Project, but with the U District Option there is not a substantial overlap of transit service with Route 67 and therefore it is not included.

Station Boardings

The forecasted daily station ridership with the Build Alternative are shown in Table 3-2 for the inbound and outbound (southbound and northbound) directions. Boardings on other routes are not included, nor are boardings at other U District Option stations along the remainder of the route, as ridership at those locations would be similar to what is described in the January 2020 EA (SDOT, 2020). The final outbound (northbound) stop at 12th Ave NE and NE 43rd St has zero boardings because passengers would only alight (exit the bus) at this location. For the inbound (southbound) direction, riders transferring between Sound Transit's U District Station could either board the U District Option at the University Way NE/NE 45th St stop or the NE 43rd St/Sound Transit's U District Station stop.

Table 3-2. Projected Daily Boardings by Station (U District Option Only)

SERVICE DIRECTION/STATION	OPENING YEAR (2026)	HORIZON YEAR (2040)
OUTBOUND (NORTHBOUND) DIRECTION		
12th Ave NE/NE 43rd St	0 (alightings only)	0 (alightings only)
INBOUND (SOUTHBOUND) DIRECTION		
University Way NE/NE 45th St	850	970
NE 43rd St/U District Station	880	1,310
Roosevelt Way NE/NE 42nd St	1,270	1,350

Notes: Station ridership is rounded to the nearest 10.

All other stations along the U District Option were previously analyzed in the January 2020 EA (SDOT, 2020).

3.1.4 Passenger Loads

Ridership is similar or lower for stations throughout the corridor under the U District Option than what is documented in the January 2020 EA (SDOT, 2020); therefore, passenger load levels of service are expected to improve, and no additional impacts are expected.

3.1.5 Station Capacity

The *Transit Capacity and Quality of Service Manual* (Transportation Research Board, 2013) includes a rating system for evaluating the capacity of a transit station area to physically accommodate the anticipated number of passengers as they wait to board transit. This LOS measure uses a LOS A through LOS F scale, with LOS A indicating ample capacity and LOS F indicating unacceptably crowded conditions at a station. To determine this LOS grade, the station area in square feet is divided by the number of estimated persons waiting to board buses (all routes) at that station during trips in the PM peak.

New or upgraded RapidRide stations in the study area would operate at LOS A through D. The station at University Way NE and NE 45th St has the highest ridership of stations in the study area and would operate at LOS D. It operates in a busy pedestrian environment, and some crowding occurs at that location currently and will continue to occur in the future. However,

total boardings from all bus routes serving this stop are forecasted to remain similar with the U District Option in 2026 and 2040 and no additional impacts are expected.

3.1.6 Travel Times

Table 3-3 presents PM peak in-vehicle transit travel times in 2026 and 2040 under the future No Build and Build conditions. The travel times are based on existing transit automated vehicle locator (AVL) data and Vissim analysis of future traffic conditions and, with the Build Alternative, improvements that would be provided as part of the U District Option. Also accounted for in these forecasts are the travel time savings due to BAT lanes on NE 45th St and 15th Ave NE that would be installed as part of the Route 44 Transit-Plus Multimodal Corridor Project, which would affect travel times for the revised Route 70 and the U District Option.

Travel times south of the U District Option study area are unchanged as documented in the January 2020 EA (SDOT, 2020), but are summarized in Table 3-3 to present overall travel time changes proposed with the U District Option. In Table 3-3, these are reflected as the travel times between 3rd Ave (at either the Virginia St or Stewart St intersections depending on direction) in downtown and the proposed station at Eastlake Ave E and Harvard Ave E, the first U District Option station south of the University Bridge. Transit travel time performance for the U District Option is also presented as the time between the Eastlake Ave E/Harvard Ave E station and the northern terminus of the U District Option, and, for the No Build condition, the terminus of the revised Route 70. The 2040 PM peak period end-to-end U District Option travel time savings (approximately 16 minutes) are shorter than the travel time savings for the RapidRide Roosevelt Project (24.2 minutes) described in the January 2020 EA due to the U District Option's shorter route length; however, the relative time savings are similar, approximately 32 percent and 36 percent, respectively.

Specific to the U District Option and the in-vehicle travel times in the University District area, a 2- to 4-minute in-vehicle travel time savings, depending on direction, would occur as part of the Build Alternative compared to Route 70 under the No Build Alternative. This is due to a combination of factors including TSP, a more direct route than the No Build Alternative, RapidRide-standard stop spacing, and RapidRide operational features such as all-door boarding.

Beyond the in-vehicle travel times described and shown in Table 3-3, a walk would be required in the No Build Alternative for a rider to transfer from Sound Transit's U District Station and the first southbound (inbound) stop of the revised Route 70 at NE 45th St and University Way NE. This walk would take approximately 1 minute at a typical 3 mile-per-hour walking pace. Similarly, in the Build Alternative, a walk would be required for a rider transferring between the last northbound (outbound) RapidRide stop at NE 43rd St and 12th Ave NE and Sound Transit's U District Station. This walk would take approximately 1.5 minutes at a typical 3 mile-per-hour walking pace.

Table 3-3. Transit In-Vehicle Travel Times, PM Peak

SEGMENT	EXTENT	2026			2040		
		NO BUILD TRAVEL TIME (MIN)	BUILD TRAVEL TIME (MIN)	BUILD-NO BUILD DIFFERENCE (MIN/%)	NO BUILD TRAVEL TIME (MIN)	BUILD TRAVEL TIME (MIN)	BUILD-NO BUILD DIFFERENCE (MIN/%)
Northbound							
Route South of Study Area	3rd Ave/Stewart St to Eastlake Ave E/Harvard Ave E	35	26	-9 -26%	39	28	-11 -28%
U District Option Study Area	Eastlake Ave E/Harvard Ave E to Last Stop (12th Ave NE/NE 43rd St)	8	5	-3 -36%	9	7	-2 -23%
Northbound Total (Full Route)		43	31	-12 -28%	49	35	-13 -27%
Southbound							
U District Option Study Area	First Stop (NE 45th St/University Way NE) to Eastlake Ave E/Harvard Ave E	10	6	-4 -37%	10	6	-4 -37%
Route South of Study Area	Eastlake Ave E/Harvard Ave E to 3rd Ave/Virginia St	32	24	-8 -25%	39	25	-14 -36%
Southbound Total (Full Route)		42	30	-12 -28%	49	31	-18 -36%
Both Directions							
Average of Northbound and Southbound Full Route		43	31	-12 -27%	50	34	-16 -32%

Note: Due to rounding, some totals may not equal the sum of the values shown.

3.1.7 Reliability

As described in the January 2020 EA (SDOT, 2020), peak period transit reliability is poor throughout the corridor, including the University District area, due to dense stop spacing in some areas, buses mixing with general purpose traffic during congested peak periods, and lack of transit priority and bus rapid transit station infrastructure.

Under the No Build Alternative, the Route 44 Transit-Plus Multimodal Corridor Project would construct transit speed and reliability improvements in the University District area. Among these improvements, BAT lanes would be installed along NE 45th St and 15th Ave NE that would be used by Route 70 under the No Build Alternative and the U District Option under the Build Alternative. These BAT lanes would improve the reliability in the University District area by separating buses from the majority of general purpose traffic. Additionally, the 12th Ave NE and NE 43rd St Paving Project and the NE 43rd St Improvements Project would together add PBLs

on NE 43rd St between 15th Ave NE and 11th Ave NE, which would improve reliability by reducing interactions between buses and bicycles.

Under the Build Alternative, the U District Option includes several transit improvements that would benefit transit reliability in the University District area, including:

- A new signal at Roosevelt Way NE and NE 43rd St with TSP and/or adaptive signal control technology
- Operational improvements at stations, including all-door boarding
- PBLs on NE 43rd St, reducing interactions between buses and bicycles
- Optimization of stop spacing (which may include consolidation of stops) between each transit stop pair

Besides the transit improvements, the U District Option would travel about a 1/3 of a mile less to complete its northern turnaround trip (approximately 1-1/3 miles) compared to Route 70 in the No Build Alternative (approximately 1-2/3 miles). The U District Option would have eight fewer traffic signals to travel through. Route 70 would travel through 19 intersections with traffic signals in the University District area while the U District Option would travel through 11 intersections with traffic signals.

With the implementation of the U District Option, Route 70, a high frequency route on 15th Ave NE and NE Campus Parkway, would be taken out of service. Both 15th Ave NE and NE Campus Parkway are heavily used transit corridors now and in the future. This would reduce bus congestion and improve reliability for other routes along those streets.

3.1.8 Layover Areas

The SDOT 12th Ave NE and NE 43rd St Paving Project is constructing a new transit layover near Sound Transit's U District Station on the east side of 12th Ave NE between NE 43rd St and NE 45th St as part of the coordination between SDOT and KCM with the North Link Connections Mobility Project. This layover would be in place as part of the No Build Alternative and does not require construction of a comfort station.

The U District Option would replace Route 70 and use this layover.

3.2 Arterial and Local Streets

3.2.1 Roadway System

The No Build Alternative includes a list of planned transportation projects in the University District area that are expected to be in place prior to service opening of the U District Option in 2026 and the 2040 horizon year (see Section 1.2.1, No Build Alternative). These planned projects would also change the roadway channelization and operations in the U District Option study area by providing an eastbound BAT lane along NE 45th St between Roosevelt Way NE and 15th Ave NE and a southbound BAT lane along 15th Ave NE between NE 45th St and NE Pacific St, converting NE 43rd St to westbound one-way operation between 15th Ave NE and Brooklyn Ave NE, and installing adaptive signal control technology at many of the traffic signals in the University District area.

The U District Option (Build Alternative) would include all of the changes implemented by the background projects included in the No Build Alternative as well as the following changes to the roadway channelization and operations:

- Signalize and provide adaptive signal control technology and/or TSP at the Roosevelt Way NE/NE 43rd St intersection
- Add PBLs on NE 43rd St between 11th Ave NE and Roosevelt Way NE
- Improvements on 11th Ave NE and Roosevelt Way NE south of NE 43rd St as described in the January 2020 EA (SDOT, 2020)

The U District Option would not modify roadway operations along 12th Ave NE, NE 45th St, and 15th Ave NE from the operations of the No Build Alternative.

3.2.2 Traffic Forecasts

The future traffic forecasts prepared for the January 2020 EA (SDOT, 2020) were utilized for this analysis to be consistent with the overall U District Option analysis.

3.2.3 Intersection Level of Service

Intersection LOS was estimated for study intersections in the U District Option study area for the 2026 and 2040 No Build and Build alternatives in the PM peak hour (see Tables 3-4 and 3-5). Any intersections estimated to operate at LOS F because of the U District Option are identified and improvements would be considered for mitigation.

Because the U District Option proposes only limited changes to the roadway system (see Section 3.2.1) and the number of buses circulating along 12th Ave NE, NE 45th St, 15th Ave NE, and NE 43rd St are similar between the No Build and Build alternatives, the intersection LOS is similar between these two conditions. With the U District Option, no intersections would degrade to LOS F; therefore, no improvements for the conceptual design are proposed. At a few intersections, the LOS changes with the U District Option, including the following:

- 12th Ave NE/NE 43rd St operates at LOS E with slightly more delay in the Build Alternative due to U District Option buses passing through the intersection.
- 11th Ave NE/NE 42nd St improves from LOS F in 2040 No Build to LOS E in the 2040 Build condition due to reduced queuing on 11th Ave NE related to the installation of the signal at Roosevelt Way NE and NE 43rd St. The signal reduces westbound approach delay at Roosevelt Way NE and NE 43rd St, thereby reducing how often westbound traffic on NE 43rd St queues back on to northbound 11th Ave NE including the intersection at NE 42nd St.

Table 3-4. PM Peak Hour Intersection Level of Service Change between No Build and Build Conditions (2026) Alternatives

REF #	INTERSECTION	TRAFFIC CONTROL	DELAY (sec/veh)		LEVEL OF SERVICE						
			NO BUILD	BUILD	A	B	C	D	E	F	
111	Roosevelt Way NE/NE 45th St	Signal	142	149							●
112	11th Ave NE/NE 45th St	Signal	34	34			●				
113	11th Ave NE/NE 43rd St	Signal	48	44				●			
114	Roosevelt Way NE/NE 42nd St (East Leg)	Signal	8	11	→						
115	11th Ave NE/NE 42nd St	Signal	49	40				●			
116	Roosevelt Way NE/NE 42nd St (West Leg)	Signal	19	19		→					
169	12th Ave NE/NE 45th St	Signal	34	33			●				
170	Brooklyn Ave NE/NE 45th St	Signal	22	22			●				
171	University Way NE/NE 45th St	Signal	16	18		●					
172	15th Ave NE/NE 45th St	Signal	31	32			●				
173	Roosevelt Way NE/NE 43rd St (East Leg)	TWSC (No Build) Signal (Build)	19	16		●					
174	12th Ave NE/NE 43rd St	AWSC	13	19		→					
175	Brooklyn Ave NE/NE 43rd St	AWSC	12	15		→					
176	University Way NE/NE 43rd St	Signal	21	20			●				
179	15th Ave NE/NE 43rd St	Signal	21	18		←					
180	Roosevelt Way NE/NE 43rd St (West Leg)	TWSC	11	11		●					
184	15th Ave NE/NE 42nd St	Signal	18	17		●					

Notes:

Gray dot indicates no change in intersection LOS between No Build and Build.

Gray arrow indicates a change in intersection LOS from one non-F rating to another non-F rating.

Red arrow indicates the intersection would degrade to LOS F with the U District Option.

Green arrow indicates the intersection would improve from LOS F to a higher rating with the U District Option.

AWSC = all-way stop-controlled

sec/veh = seconds per vehicle

TWSC = two-way stop-controlled (TWSC delays are for side streets)

Table 3-5. PM Peak Hour Intersection Level of Service Change between No Build and Build Conditions (2040)

REF #	INTERSECTION	TRAFFIC CONTROL	DELAY (SEC/VEH)		LEVEL OF SERVICE						
			NO BUILD	BUILD	A	B	C	D	E	F	
111	Roosevelt Way NE/NE 45th St	Signal	169	171							●
112	11th Ave NE/NE 45th St	Signal	38	39				●			
113	11th Ave NE/NE 43rd St	Signal	66	59					●		
114	Roosevelt Way NE/NE 42nd St (East Leg)	Signal	9	11	→						
115	11th Ave NE/NE 42nd St	Signal	82	74						←	
116	Roosevelt Way NE/NE 42nd St (West Leg)	Signal	22	22			●				
169	12th Ave NE/NE 45th St	Signal	56	53				←			
170	Brooklyn Ave NE/NE 45th St	Signal	38	38				●			
171	University Way NE/NE 45th St	Signal	28	30			●				
172	15th Ave NE/NE 45th St	Signal	61	63					●		
173	Roosevelt Way NE/NE 43rd St (East Leg)	TWSC	19	18			●				
174	12th Ave NE/NE 43rd St	AWSC	27	39				→			
175	Brooklyn Ave NE/NE 43rd St	AWSC	11	15		→					
176	University Way NE/NE 43rd St	Signal	21	21			●				
179	15th Ave NE/NE 43rd St	Signal	27	25		●					
180	Roosevelt Way NE/NE 43rd St (West Leg)	TWSC	15	15		●					
184	15th Ave NE/NE 42nd St	Signal	21	21			●				

Notes:

Gray dot indicates no change in intersection LOS between No Build and Build.

Gray arrow indicates a change in intersection LOS from one non-F rating to another non-F rating.

Red arrow indicates the intersection would degrade to LOS F with the U District Option.

Green arrow indicates the intersection would improve from LOS F to a higher rating with the U District Option.

AWSC = all-way stop-controlled

sec/veh = seconds per vehicle

TWSC = two-way stop-controlled (TWSC delays are for side streets)

3.2.4 General Purpose Travel Times

Because the Build Alternative does not propose substantial roadway modifications (see Section 3.2.1) and would have similar roadway operations (see Section 3.2.3), the general purpose travel time in the U District Option study area is expected to be similar between the No Build and Build alternatives.

3.2.5 Property Access and Circulation

The U District Option would not close any driveways or noticeably change roadway operations (see Section and 3.2.1 and Section 3.2.3) in the U District Option study area. One passenger load zone and one shuttle load zone would be removed (see Section 3.4). Otherwise no impacts to circulation and property access within the study area are expected with the U District Option.

3.3 Pedestrians and Bicyclists

3.3.1 Pedestrian System

Several projects are planned for the University District that would result in improvements to the pedestrian system as part of the projects identified in the No Build Alternative (see Section 1.2.1, No Build Alternative). These projects would upgrade pedestrian conditions in the study area with features such as curbless design, traffic calming/circulation improvements, and replacing sections of sidewalk.

In the Build Alternative, the U District Option would further improve pedestrian access and conditions. New and upgraded stations would be designed to meet ADA, *Seattle Right-of-Way Improvements Manual* (City of Seattle, 2017), and *King County Metro Transit Passenger Facilities Improvements Standard Details* (KCM, 2011) standards to the maximum extent feasible; typical station platform widths would be 8 to 10 feet. The U District Option would also maintain pedestrian access to and around the proposed stations.

Where adequate pedestrian amenities are not provided in the No Build condition, the U District Option would also provide some or all of the following amenities at stations:

- Shelters
- Benches
- Pedestrian-scale lighting
- Trash receptacles
- Signage/wayfinding

The stop at NE 43rd St and 12th Ave NE is not expected to feature most of these rider amenities because riders would only exit the bus at this location, although wayfinding may be provided.

Overall, these changes would enhance the existing pedestrian environment, increase pedestrian connectivity, and improve the overall appearance of the street for all users.

As part of the U District Option, a new traffic signal would be added at the currently stop-controlled intersection of Roosevelt Way NE/NE 43rd St, providing newly signalized pedestrian crossings along and across Roosevelt Way NE, a heavily travelled principal arterial. No removals of pedestrian walkways are proposed with the U District Option.

3.3.2 Sidewalk Maintenance Condition

The U District Option would either maintain or improve the maintenance condition of sidewalks in the study area. Some short sections of sidewalk would be replaced in association with work at the intersection of Roosevelt Way NE/NE 43rd St, and with the installation of new RapidRide stations. No other work is proposed that would substantially affect the sidewalk maintenance condition.

3.3.3 Intersection Treatments

All existing pedestrian crossing movements would be maintained with the U District Option; no crosswalks or pedestrian signal phases would be removed. An estimated six existing curb ramps would be replaced at the Roosevelt Way NE and NE 43rd St intersection. No ramps would be eliminated or replaced with non-compliant ramps without Maximum Extent Feasible documentation (SDOT, 2017). While the U District Option is proposing roadway modifications at the 11th Ave NE/NE 43rd St intersection and would provide ADA-compliant curb ramps, this intersection was previously accounted for in the January 2020 EA (SDOT, 2020) and therefore is not included in this tally.

3.3.4 Pedestrian Volumes

Pedestrian volumes are projected to increase in the University District area in the future No Build conditions with Sound Transit's U District Station opening in 2021 as well as the expected growth in job and housing densities.

With the U District Option, pedestrian volumes would increase further at new and upgraded stations. Forecasts for the Build Alternative indicate stop-level ridership levels that are similar to the ridership forecasts documented in the January 2020 EA (SDOT, 2020), which found no impacts due to this increased pedestrian activity. The stops at NE 45th St/University Way NE and NE 42nd St/Roosevelt Way NE, which exist today and would be upgraded as part of the U District Option, would continue to be served by other transit routes under the Build Alternative. At NE 45th St/University Way NE, transit rider volumes for all routes under the Build and No Build alternatives are similar in 2040 (3,680 and 3,270 daily boardings, respectively), so the Build Alternative would not cause a noticeable change in pedestrian congestion at this location. At NE 42nd St/Roosevelt Way NE, overall ridership is expected to grow from approximately 210 under the No Build Alternative to 1,570 under the Build Alternative. The surrounding pedestrian environment has sufficient capacity to accommodate this increase without overcrowding.

The station on NE 43rd St, at Sound Transit's U District Station is part of the Sound Transit Northgate Link Extension project, reflected in the No Build Alternative, and has the capacity to accommodate the expected volumes of bus and rail passengers, as well as pedestrians passing through the area. No impacts are expected at this location.

3.3.5 Bicycle Facilities

As part of the No Build Alternative, bicycle facilities would be constructed as part of the NE 43rd St Improvements and 12th Ave NE and NE 43rd St Paving projects. These include PBLs on both sides of NE 43rd St between 15th Ave NE and 11th Ave NE, except for the westbound segment between 15th Ave NE and Brooklyn Ave NE, which will be a shared bicycle/vehicle lane.

The U District Option would provide further improvements to the bicycle conditions by adding one block (approximately 250 feet) of new PBLs along both sides of NE 43rd St between Roosevelt Way NE and 11th Ave NE. These lanes would include painted buffers to provide separation between cyclists and vehicles in the roadway. These bike lanes would improve the bicycle network by creating a continuous connection between the University of Washington and Sound Transit’s U District Station, and the 11th Ave NE/Roosevelt Way NE couplet, which is already reflected in the January 2020 EA (SDOT, 2020). This provides a regional connection across the University Bridge and through Eastlake, South Lake Union, and Downtown.

In addition to the new bike lanes, bicycle mobility would be improved through the signalization of Roosevelt Way NE and NE 43rd St, which would facilitate the westbound left turn from the PBLs on NE 43rd St into the PBLs on Roosevelt Way NE and the southbound left turn from the PBL on Roosevelt Way NE into the eastbound PBL on NE 43rd St. No other bicycle facilities would be removed or modified by the U District Option.

3.3.6 Bicycle Volumes

As described in Section 3.3.5, the U District Option would provide PBLs along NE 43rd St for approximately one block. Bicycle volumes are expected to be similar between the No Build Alternative and the Build Alternative (U District Option). The bicycle improvements proposed as part of the U District Option would be sufficient to accommodate the additional bicycle trips that may be attracted to the corridor resulting from these improvements.

3.4 Parking

The background projects under the future No Build Alternative will affect the parking conditions in the University District area compared to the current parking conditions. SDOT, in response to the Sound Transit U District Station opening in 2021, will implement a variety of curbside management strategies surrounding the station area. This includes converting unrestricted on-street parking to restricted (paid) parking within one-quarter mile of the Link station. Additionally, SDOT’s 12th Ave NE and NE 43rd St Paving Project and the NE 43rd St Improvements Project would remove parking along the east curb of 12th Ave NE between NE 45th St and NE 43rd St to provide bus layover and along both sides of NE 43rd St between 11th Ave NE and 15th Ave NE to install PBLs.

3.4.1 On-street Parking Inventory and Loading Zone Changes

The U District Option would have a minor impact on the on-street parking and load zones in the University District area. As shown in Table 3-6, on NE 43rd St between 11th Ave NE and Roosevelt Way NE the U District Option would remove one passenger load zone, and between approximately eight and eleven parking spaces and one shuttle load zone—depending on the time of day—to install the PBLs. The north side of NE 43rd St has approximately six spaces that are standard pay spaces during weekdays and unmanaged during nights, Sundays, and holidays. Also on that northwest blockface is a shuttle load zone reserved for use by the University of Washington/Fred Hutch South Lake Union Shuttle between the hours of 6 AM and 8 PM on weekdays. On weeknights, Sundays, and holidays the shuttle load zone reverts to approximately three unrestricted public parking spaces and on Saturdays it functions as three paid public spaces.

A 2018 parking utilization study found 100% utilization of these spaces during the mid-day (12 PM), 75% utilization in the early evening (5 PM), and 33% utilization in the evening (8 PM). Otherwise, no on-street parking would be affected under the Build Alternative compared to the No Build Alternative.

Table 3-6. Summary of Change in Future with the U District Option On-Street Parking Inventory by Type

STUDY ZONE	MIDDAY/LATE EVENING/OVERNIGHT PERIOD ^a				PM PEAK PERIOD			
	PARKING	LOADING ZONES			PARKING	LOADING ZONES		
		CVLZ	PLZ	SHUTTLE		CVLZ	PLZ	SHUTTLE
NE 43rd St between Roosevelt Way NE and 11th Ave NE (north side)	-9	-	-	-	-6	-	-	-1
NE 43rd St between Roosevelt Way NE and 11th Ave NE (south side)	-2	-	-1	-	-2	-	-1	-
Total	-11	-	-1	-	-8	-	-1	-1

Notes:

Negative numbers show the number of parking spots that would be removed by the U District Option.

The information shown in this table does not reflect the proposed parking changes documented in the January 2020 EA (SDOT, 2020).

The documented parking removal shown in this table is parking that would only be removed with the U District Option and was therefore not described in the January 2020 EA.

CVLZ = commercial vehicle load zone; PLZ = passenger load zone; Shuttle = shuttle load zone

3.5 Safety

3.5.1 Vehicular Collisions

Under the No Build Alternative, planned projects in the study area would modify roadway conditions through changes to channelization, provide transit improvements, and implement streetscape and traffic calming treatments. These changes would either have no effect on safety or would reduce the prevalence and severity of vehicle conflict points and vehicle speeds; therefore, the number of collisions in relationship to traffic volume is expected to be similar to or better than existing conditions.

Under the Build Alternative, vehicular safety is likely to improve or remain similar along streets modified as part of the U District Option. Overall, the U District Option would travel about a 1/3 of a mile less to complete its northern turnaround trip (approximately 1-1/3 miles) compared to Route 70 in the No Build Alternative (approximately 1-2/3 miles). Beyond having less distance for the bus to travel, the removal of parking from NE 43rd St is anticipated to reduce the collision rate due to the elimination of conflict points between vehicles in through lanes and those entering and leaving parking spaces. The proposed traffic signal at the Roosevelt Way NE/NE 43rd St intersection could improve overall safety by managing flows and providing a

dedicated phase for vehicles turning left from NE 43rd St onto Roosevelt Way NE — currently a stop-controlled movement. Beyond the channelization changes associated with the new signal and the new PBLs (discussed below), the remaining roadway changes (e.g. paving and restriping) are not expected to substantially affect the frequency or severity of vehicular collisions in the study area.

3.5.2 Pedestrian and Bicycle Collisions

The 12th Ave NE and NE 43rd St Paving and the NE 43rd St Improvements Projects built under the No Build Alternative include pedestrian and bicycle-oriented treatments. As part of these two projects, PBLs would be installed along NE 43rd St between 11th Ave NE and 15th Ave NE. These treatments are expected to improve non-motorized safety under the No Build Alternative compared to existing conditions.

Under the Build Alternative, new crosswalks, ADA curb ramps, and protective phasing associated with the proposed traffic signal at Roosevelt Way NE and NE 43rd St would improve pedestrian and cyclist safety. The new signal could also improve safety through improved pedestrian compliance with crossing restrictions, by more clearly indicating where crossing is permitted. Some segments of sidewalk would be replaced as part of the proposed new stations and the upgrading of existing bus stops to RapidRide design standards, potentially reducing hazards to pedestrians. Beyond these improvements, the U District Option would have limited to no impact on pedestrian operations and safety.

Cyclists would experience improvements in safety, with installation of PBLs along NE 43rd St between Roosevelt Way NE and 11th Ave NE. These PBLs would complete the bicycle connection between the University of Washington and Sound Transit's U District Station, and the couplet of the southbound PBL along Roosevelt Way NE and the northbound PBL along 11th Ave NE included in the U District Option, providing a regional connection across the University Bridge and through the Eastlake, South Lake Union, and Downtown neighborhoods.

In the eastbound direction along NE 43rd St, the PBL would be elevated through the bus stop at NE 43rd St and 12th Ave NE to minimize conflicts with people on bikes and buses. PBLs are anticipated to reduce the number of collisions by removing bicycles from mixed traffic as well as providing a buffer from other modes.

3.6 Freight

3.6.1 Freight Operations

The City of Seattle has designated Roosevelt Way NE, 11th Ave NE, and NE 45th St as Minor Truck streets in the U District Option study area. No other streets have a truck designation in the study area. The U District Option does not propose substantial roadway channelization or street modifications (see Section 3.2.1) that would impact freight operations. Additionally, the future intersections LOS under the U District Option is similar compared to the No Build Alternative (see Section 3.2.3); therefore, freight operations are not expected to be affected by the Build Alternative.

3.6.2 Freight Access

There are no commercial load zones within the section of parking removed along NE 43rd St. No impacts to freight access are expected with the U District Option.

4.0 CONSTRUCTION

This section discusses the potential impacts that would be caused by the construction of the U District Option.

4.1 Construction Scope and Activities

Construction of the U District Option would involve the following activities:

- Installation of temporary traffic control measures
- Removal of existing pavement
- Construction of new pavement, curbs, sidewalks, and curb ramps
- Relocation, modification, or protection of utilities in conflict with or affected by elements of the U District Option
- Installation of drainage systems such as collection locations and detention facilities
- Construction of bus stations, including RapidRide amenities
- Installation of traffic signal improvements
- Installation of OCS poles, wires, support brackets, feeder cables, and other components
- Signage and pavement markings

4.2 Construction Duration and Phasing

Construction of the U District Option would require approximately 36 months to complete², but new construction impacts with the U District Option would be much shorter in duration. In general, each station location would typically have a 4- to 6-week construction phase to construct and install the transit amenities. Paving on NE 43rd St between Roosevelt Way NE and 12th Ave NE would have the longest construction duration for activities associated with the U District Option and the duration would depend on how the work is phased.

It is anticipated that the first phase of construction would include utility relocation and installation of new utilities. This would be followed by pole foundations and paving along NE 43rd St. The stations and amenities and installation of the OCS poles and wiring would likely be the last construction elements to be completed.

² Potential water utility and paving work in the Eastlake Neighborhood associated with the U District Option will be coordinated with Seattle Public Utilities. This would include potential Seattle Public Utilities-led water utility improvements on Eastlake Avenue that may be constructed as a separate or concurrent project. This water utility and paving effort would extend the construction schedule for the U District Option (which was previously planned for 24 months) to approximately 36 months in the Eastlake Neighborhood only; construction duration for the U District Option outside of the Eastlake Neighborhood would remain at approximately 24 months and would likely be conducted in phased work zones to minimize impacts.

4.3 Construction Impacts

The U District Option would have similar construction impacts to those described in the January 2020 EA (SDOT, 2020).

Construction is planned to be limited to the existing right-of-way but may require temporary construction easements. In general, one lane of traffic adjacent to the station area would be temporarily closed. For some work elements, such as traffic signal work, OCS pole and wiring installation, paving, and utility work, portions of streets may need to be closed for short periods; including potentially a full closure of NE 43rd St where paving is proposed. To the extent feasible, these activities would be scheduled during non-peak traffic periods. Signal improvements would also require temporary signal deactivation. During construction, work zone traffic control measures would help to ensure vehicles are able to navigate safely through or around construction areas. To the extent feasible, access to adjacent properties would be maintained along the corridor.

Lane closures in the University District area would affect transit service, including temporary stop closures and delays to buses from congestion. It is expected that the transit routes would continue along their routes and not require detours. At existing stops that will be upgraded to RapidRide stations, station construction would require temporary relocation of the stop.

Station construction would generally require the closure of the surrounding sidewalk near that station. At intersections where construction work would take place, one or more crossing movements could be temporarily closed. In these conditions, pedestrians would need to use an adjacent crossing or cross the street using the other intersection crossings.

Bicycles would be required to detour from bicycle lanes to general purpose travel lanes where those facilities overlap with station, OCS, and signal construction work, such as along NE 43rd St. Cyclists continuing to ride on the corridor may need to ride over disturbed asphalt or steel plates, and in lanes with general purpose traffic. Alternatively, they would have the option of using parallel streets in the University District neighborhood, including designated neighborhood greenways and signed bicycle routes.

Most of the U District Option construction activities would likely temporarily restrict parking along the street segment being constructed. Parking along the cross-streets or on parallel streets is less likely to be affected by construction. The loss of parking would only be temporary for the duration of the construction in that area. Various load zones would also be removed in the areas where on-street parking is removed during construction and temporarily relocated where feasible.

5.0 POTENTIAL MITIGATION MEASURES

This section describes the potential mitigation measures that would be implemented as part of operation and construction of the U District Option.

No mitigation beyond what is proposed in the January 2020 EA (SDOT, 2020) is anticipated during operation for the following transportation elements because there are no additional impacts expected from the U District Option, or it results in benefits during operations. These elements include:

- Regional Traffic and Roadways
- Transit
- Arterial and Local Street Operations
- Pedestrians and Bicyclists
- Safety
- Freight

Potential mitigation has been identified for parking (during operations) and construction and is further described below.

5.1 Parking

See Section 3.4, Parking, for a description of parking removals proposed as part of the U District Option. SDOT will relocate the impacted NE 43rd St passenger load zone and shuttle load zone nearby, where feasible, to facilitate passenger pick-up and drop off for nearby buildings. As part of the Performance-Based Parking Program, SDOT actively manages the paid parking in this area to ensure a few open spaces on each blockface with paid parking. Otherwise, no additional mitigation beyond what was proposed in the January 2020 EA is required for the loss of parking associated with the U District Option.

5.2 Construction

No mitigation is proposed for construction transportation impacts beyond what was proposed in the January 2020 EA. Prior to construction of the U District Option, SDOT will prepare detailed construction plans during final design. All mitigation associated with constructing the U District Option will comply with SDOT-approved/coordinated traffic control plans and, if required, a construction management plan and haul-route plan.

This page intentionally left blank.

6.0 INDIRECT IMPACTS

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

The base land use assumptions used to develop the future travel demand forecasts for the U District Option (using the Puget Sound Regional Council travel demand forecast model) are consistent with the *City of Seattle Comprehensive Plan* (City of Seattle, 2019), which includes goals for substantial increases in transit utilization and density in the neighborhoods served by the U District Option. Therefore, the potential for “induced growth” is already incorporated into the forecasts as “planned growth,” consistent with the Comprehensive Plan. As such, no indirect impacts are anticipated as a result of constructing the U District Option.

As part of the Performance-Based Parking Program, SDOT actively manages the paid parking in this area to provide spaces on each blockface with paid parking where feasible, therefore no indirect impacts on businesses in the University District neighborhood are expected with the elimination of on-street parking on NE 43rd St between 11th Ave NE and Roosevelt Way NE.

Furthermore, the parking mitigation strategies described in the January 2020 EA would be implemented as part of the U District Option and would reduce the potential for indirect impacts on businesses and residents. The U District Option would also implement modal priorities consistent with the Comprehensive Plan and City’s goals and policies related to the best use of curb space. With the implementation of mitigation measures related to parking, improvements in transit and bicycle access, and the planned growth in the corridor, no long-term indirect impacts on businesses are anticipated.

This page intentionally left blank.

7.0 CUMULATIVE IMPACTS

This section discusses potential consequences of constructing the U District Option combined with other future transportation system changes. The analysis of the No Build Alternative and the U District Option is inherently cumulative because it is based on regional forecasts that assume future funded projects and future population and employment growth that is consistent with adopted land use plans. However, other planned, but not funded, regional and local transportation and development projects could have some effects on transit ridership and travel patterns within the study area.

7.1 Parking

As noted in Section 3.4, the U District Option would remove on-street parking spaces along NE 43rd St between Roosevelt Way NE and 11th Ave NE, in addition to the parking removal described in the January 2020 EA. These on-street parking spaces currently include a passenger load zone, a shuttle load zone, and paid and unpaid parking spaces (depending on the time of day).

With the opening of Sound Transit's U District Station and the subsequent curb space management policies and measures, the parking supply and utilization in the University District area will adjust in the future. Through previous commitments, SDOT will conduct a parking study surrounding Sound Transit's U District Station prior to light rail service operation in the area in 2021. Prior to station opening, SDOT will work with the community and stakeholders to identify measures to manage parking in the area. After the station opens, SDOT will continue to monitor to see if any adjustments to the curb space management measures are warranted.

7.2 General Population and Employment Growth

The future transportation impacts discussed in Section 3 were based on the results of modeling that incorporates funded and approved future actions as well as projected growth that would include development in the region. Unforeseen changes to the pace and pattern of development projects could affect transit ridership and travel patterns within the study area, including traffic operations and parking near stations. These changes could affect how people access the stations. An increase in development intensity would likely be accompanied by an increase in people walking or biking to a station as nearby development occurs and planned nonmotorized facilities are implemented. If development slows, the reverse will likely occur.

7.3 Construction

Section 4, Construction, covers the impacts of the U District Option construction, which would currently begin as early as 2022 with substantial completion of construction by 2025 and service opening in 2026. The current construction schedules of the projects described in Section 3.2, that are included as part of the No Build Alternative, are expected to be built and in operation prior to the beginning of construction for the U District Option. Coordination with the SDOT projects in the University District area during development of the U District Option included an effort to minimize overlapping of projects to avoid multiple sequential construction impacts to the same street segments. Therefore, there is not an expectation of cumulative effects caused by

5. POTENTIAL MITIGATION MEASURES

construction activities from multiple projects in the University District area combined with the U District Option construction period.

8.0 REFERENCES

City of Seattle. 2017. "Seattle Streets Illustrated," online Seattle Right-of-Way Improvements Manual. <http://streetsillustrated.seattle.gov/>. June.

City of Seattle. 2019. *City of Seattle Comprehensive Plan*. <http://www.seattle.gov/opcd/ongoing-initiatives/comprehensive-plan#projectdocuments>.

Federal Highway Administration. 2009. *Manual on Uniform Traffic Control Devices*. https://mutcd.fhwa.dot.gov/kno_2009r1r2.htm

King County Metro (KCM). 2011. *King County Metro Transit Passenger Facilities Improvements Standard Details*.

Seattle Department of Transportation (SDOT). 2017. SDOT Policy for MEF Documentation for Curb Ramps. June 1. Accessed February 4, 2021. [http://www.seattle.gov/Documents/Departments/SDOT/Services/PolicyMemo_CurbRampWings_Final.pdf#:~:text=The%20curb%20ramp%20wing%20shall%20not%20be%20required,for%20construction%20to%20the%20maximum%20extent%20feasible%20\(MEF\)](http://www.seattle.gov/Documents/Departments/SDOT/Services/PolicyMemo_CurbRampWings_Final.pdf#:~:text=The%20curb%20ramp%20wing%20shall%20not%20be%20required,for%20construction%20to%20the%20maximum%20extent%20feasible%20(MEF)).

Seattle Department of Transportation (SDOT). 2020. *RapidRide Roosevelt Project Environmental Assessment*. January.

Transportation Research Board. 2013. *Transit Capacity and Quality of Service Manual*. 3rd Edition.

This page intentionally left blank.

Attachment 1
RapidRide Roosevelt Project
Transportation No Build and Build
Transit Assumptions

This page intentionally left blank.

Route*	2026 No-Build	2040 No Build
26	Rerouted and changed frequency	Same as 2026, except for Route 48 which is replaced by 23rd Ave RapidRide
31 and 32	Rerouted	
43	Unchanged	
44	Rerouted and changed frequency	
45	Combined with Rt 75	
48	Rerouted and changed frequency	
49	Rerouted	
64	No change	
65 and 67	No change	
70	Rerouted	
71	Replaced by Rt 79	
73	Rerouted and changed frequency	
74 and 79	Rerouted and changed frequency	
75	No change	
271	No change	
372	Rerouted	
373	Replaced by Rt 73	
ST 542	Re-routed to U District Station	
CT 810	Truncated at Mountlake Terrace Station	
CT 821	Truncated at Lynnwood Station	
CT 855	Delete (consolidated with CT 821)	
CT 860	Terminate around Lynnwood Station	
CT 871	Terminate around Lynnwood Station	
CT 880	Truncated at Ash Way P&R	
Link Light Rail	Extends to Lynnwood	

Notes:

- Build assumptions are identical for each year except for the substitution of RapidRide Roosevelt with U District Option
- Bus routes listed reflect the assumptions in the King County North Link Connections Project and Community Transit Service Re-Structuring Plan with Lynnwood Link Extension

This page intentionally left blank.