

RapidRide Prioritization Plan Alignment Screening

Executive Summary

After conducting an assessment of market connections, reviewing existing plans and documents, and evaluating options for routing on all eight study corridors (including one corridor with two alignment alternatives), the project team has recommended representative alignments for use in the RapidRide Prioritization Plan (RRPP) project. Full alignments can be viewed in later sections of this report as well as in the [online map](#). **Figure 1 summarizes the representative alignments.**

These corridors will be studied in depth in future project phases and will be evaluated through the prioritization process to identify corridors with the most potential for the interim RapidRide network.

Figure 1 *Representative Alignment Summary*

Route Name	Representative Alignment Location	Alignment Screening Summary	Comparison with Metro Connects
Route 44	Ballard, Wallingford, Children’s Hospital	The current service alignment provides strong network connections and avoids significant capital costs and risk	The proposed representative alignment is the current service pattern, not the routing shown in Metro Connects
Route 36	U. District, Beacon Hill, Othello	Would not disrupt current ridership and could serve a new ST3 transfer in Pioneer Square or Chinatown International District (CID)	Current service pattern
Route 36 / Route 49	Downtown Seattle Central Business District (CBD), Beacon Hill, Othello	Provides new connections between SE Seattle and First Hill, Capitol Hill. However, would disrupt a high portion of current trips to some degree	Aligns with Interim and 2050 Metro Connects
Route 40	Northgate, Ballard, Seattle CBD, First Hill	Screening of terminus options support northern travel via Northgate Way and a Southern terminus in First Hill.	Generally aligns with Interim and 2050 Metro Connects with minor routing modifications
Route 150	Kent, Southcenter, Seattle CBD	The current service pattern scored better on most criteria, the full implications of a truncated route would need to be evaluated in a separate process	Aligns with Metro Connects Interim Network, does not align with 2050 network

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Route Name	Representative Alignment Location	Alignment Screening Summary	Comparison with Metro Connects
Route 165	Highline Community College (CC), Kent, Green River CC	No screening conducted.	Generally aligns with Interim and 2050 Metro Connects with some routing modifications
Route 181	Twin Lakes, Federal Way, Green River CC	No screening conducted.	Generally aligns with Interim and 2050 Metro Connects with some routing modifications
B Line / Route 226	Redmond, Overlake, Eastgate	No screening conducted.	Generally aligns with Interim and 2050 Metro Connects with some routing modifications
B Line / Route 271	Crossroads, Bellevue, U. District	No screening conducted.	Generally aligns with Interim and 2050 Metro Connects with routing modifications to match East Link network restructure

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Background

Project Purpose and Goals

The purpose of this project is to provide planning and related services to King County Metro (Metro) to determine the RapidRide line candidate corridors for the expansion of and reinvestment in Metro’s RapidRide network, Metro’s bus rapid transit service. RapidRide is an integral part of the region's high-capacity transit network that improves mobility along major corridors and connects key destinations and regional growth centers. The current RapidRide network consists of seven lines (A-F, H) with three additional lines under construction (G) or in the planning and design stage (I and J). An additional two lines, the K Line and the R Line are planned to be the next RapidRide lines developed following the J Line.

Starting in 2018, Metro conducted a planning process for the expansion of the RapidRide network called the RapidRide Expansion Program. The RapidRide Expansion Program established new standards for RapidRide service and conducted evaluations of six suburban corridors. Additionally, the Metro Connects long-range plan, adopted in 2021, identified a pool of eight candidates for new or significantly modified RapidRide routes (Figure 2).

Figure 2 Metro Connects Interim Network RapidRide Candidates

Metro Connects Corridor Number	Candidate Description	Current Equivalent Routes	Location
1012	New RapidRide Line	Route 44	Ballard, Wallingford, Children’s Hospital
1049	New RapidRide Line	Route 150	Kent, Southcenter, Seattle CBD
1052	New RapidRide Line	Route 181	Twin Lakes, Federal Way, Green River CC
1056	New RapidRide Line	Route 165	Highline CC, Kent, Green River CC
1064	New RapidRide Line	Route 36 and 49	U. District, Beacon Hill, Othello
1993	New RapidRide Line	Route 40	Northgate, Ballard, Seattle CBD
1999	Modification and Extension of Existing Line	B Line and 226	Redmond, Overlake, Eastgate
3101 + 1028	Modification and Extension of Existing Line	B Line and 271	Crossroads, Bellevue, U. District

The ordinance adopting Metro Connects requires the creation of the RRPP to determine the specific candidates to be developed as part of the interim network. The RRPP must be submitted to the Regional Transit Committee, a body of local elected officials that reviews and makes recommendations to the King County Council on countywide policies and plans, for review no later than June 2024.

The project will develop a Prioritization Plan to determine the number and specific candidates to be developed as RapidRide lines as part of the interim network after the K and R lines are developed. To do this, this project will a reasonable conceptual alternative for each candidate corridors and conduct a preplanning level corridor study for each candidate corridor. These

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corridor studies will consider route alignment options, operations plan, capital investment needs, potential ridership, and develop planning level cost estimates for each candidate corridor.

Memo Context

This memo summarizes the process used to identify, refine, screen, and confirm representative alignments for each study corridor. This process began by identifying existing alignments within Metro Connects, and developing any modifications or alternative alignments for consideration based on other prior studies, current service patterns, and an assessment of market connections. The purpose of this phase of work was to identify the most appropriate and competitive alignment for consideration in the RapidRide Prioritization Project. Using a high-level screening process, alignment options were evaluated to identify a representative alignment for the corridor study, evaluation and prioritization phases. The screening process was primarily intended to confirm whether the Metro Connects alignment should be assumed for study, or whether any modifications or alternative routings should be studied. The corridor study phase will identify more detail for each representative corridor including operational facilities such as layover, bays at transit centers and other capital investments.

This study endeavors to use a single, representative alignment to assess the benefits and constraints of each corridor for purpose of prioritization. The representative alignment used during screening is not intended to be a final selected corridor alignment. Final alignment and terminus decisions will be made during later phases of project development, and will be informed by community input and approved by the County Council.

Methodology

This section provides an overview of the process that was used to identify alignment options, narrow those options, and screen to select a single representative alignment.

Alignment Identification

An initial set of potential alignments for each corridor were identified by reviewing previous work and documents as well as current service patterns, Metro Connects planned service, and key market destinations. Additionally, the consultant team conducted a review of key market connections, future service plans, and roadway conditions to identify additional alignment or service concepts. Data considered in this assessment included population and employment density, major employment centers, colleges and universities, and current ridership data.

The Corridor Screening section of this report includes a summary of all alignments identified for each corridor.

Alignment Narrowing for Screening

Some of the alignments identified were removed from consideration after discussing them with Metro. Various issues or fatal flaws such as poor options for terminus locations or infeasibility of segment operations led to elimination. Some differences between alignments were minor enough to be relatively meaningless at the level of evaluation scoped for this prioritization study. In such cases, alignment options were evaluated for consistency with Metro's Service

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Guidelines and RapidRide Standards and a specific alignment selected in consultant with Metro staff.

For some corridors (Route 165, Route 181, B Line/Route 226 and B Line/Route 271) the narrowing of alignment options resulted in a single representative alignment. As there were no variations to screen, these corridors were not advanced to the screening process.

Screening Process

For the remaining alignments, a high-level screening process was developed to evaluate the strengths and weaknesses of each option. To compare alignment options for each corridor, eight measures were evaluated. Using available data and information, this analysis identified screening criteria with qualitative and quantitative measures. The eight screening criteria were grouped into four measure types: operational, demographic, accessibility, and infrastructure and cost.

Screening criteria are summarized in Figure 3. The following sub-sections describe the criteria in more detail.

Figure 3 Alignment Screening Criteria Summary

Measure Type	Criteria	Methodology	Data Source
Operations	Speed, Reliability, Schedule Adherence	<ul style="list-style-type: none"> Delay (bus delay per mile per trip) 	Metro speed and reliability dashboard (year, data, etc.)
Operations	Consistency with Service Guidelines	<ul style="list-style-type: none"> Route directness Corridor contribution to high-capacity transit network 	Existing Metro route alignments and stop locations
Demographics	Current Demographics	<ul style="list-style-type: none"> Area-weighted mean job score Area-weighted mean equity score Total population Total jobs 	<ul style="list-style-type: none"> Metro’s Equity Prioritization Score and Opportunity Index Score Longitudinal Employer-Household Dynamics (LODES) 2020 US Census American Community Survey (ACS) 2017-21
Accessibility	Origin-Destination	<ul style="list-style-type: none"> Trip counts (all modes) within alignment buffer Transit trip counts within alignment buffer Transit trips as percent of all trips 	Replica trip matrix by origin, destination, and mode of transportation (2021)
Accessibility	Ridership	<ul style="list-style-type: none"> Stop-level daily ridership. Ridership per capita 	Metro (Fall 2021)
Infrastructure and Costs	Trolley Wire Infrastructure	<ul style="list-style-type: none"> Length of new wire 	Existing trolley wire shapefile

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Measure Type	Criteria	Methodology	Data Source
Infrastructure and Costs	Infrastructure Risks	<ul style="list-style-type: none"> Potential risks 	Metro comments regarding structural concerns (pavement); significant layover; comfort station; turnaround issues; and other potential costs
Infrastructure and Costs	Local Support	<ul style="list-style-type: none"> Inclusion in previous documents 	Existing planning documents or feedback from Metro or local jurisdictions

OPERATIONS – SPEED, RELIABILITY, SCHEDULE ADHERENCE

Measure: How well the existing buses travel along the corridor without significant delays.

Indicator: Lesser delay shows better service reliability.

Data & Methodology: Fall 2021 run time variability data, measured as bus delay per mile per trip.

Categorization: Transit delay levels categorized as:

- High = greater than 1.65 minutes per mile
- Moderate = less than 1.65 minutes more mile and more than 1.00 minutes per mile
- Low = less than 1.00 minute per mile per trip.

OPERATIONS – TRANSIT NETWORK VALUE

Measure: This criterion uses both qualitative and quantitative information to determine the alignments’ transit network values.

Indicator: Factors considered include route directness, consistency with service guidelines, and corridor contribution to the high-capacity transit network (such as existing and future Link and RapidRide lines¹).

Data & Methodology: Alignments’ connections to the existing transit network and transfer opportunities are calculated by counting the number of served Link stations, number of intersecting frequent routes, and number of intersecting RapidRide lines. A station or route is served if it is within a quarter-mile buffer of the corridor.

Categorization: Qualitative and quantitative assessment

¹ Future RapidRide lines include G, I, J, K and R Lines.

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DEMOGRAPHICS – CURRENT DEMOGRAPHICS

Measure: This criterion measures how many people, jobs and equity populations would be served by an alignment option.

Indicator: More density indicates stronger potential for ridership

Data & Methodology: Employment data is from the US Census 2020 LODES, and population data from the US Census ACS 5-Year 2017-2021 Estimates. King County Metro provided the Equity Prioritization Score and Opportunity Index Score for each Census Block Group at a scale between 1 and 4. The Equity Prioritization Score indicates the concentration of equity populations (based on 2021 Census data), while the Opportunity Index Score indicates the concentration of employment (based on 2019 LEHD data). The alignments' quarter-mile buffers are intersected with Census Block Groups. Then, the Equity Prioritization Score and Opportunity Index Score are averaged and weighted by the buffer area.

Categorization: Comparative assessment of Area-Weighted Mean Job Score and Area-Weighted Mean Equity Score

ACCESSIBILITY – ORIGIN-DESTINATION

Measure: This measure identifies the number of trips that occur along a route alignment.

Indicator: Alignments with more trips beginning and ending along the corridor would serve more travel demand; alignments with higher transit mode share are meeting current travel needs well, whereas alignments with lower mode share could represent opportunities to grow ridership through improved service.

Data & Methodology: Analysis is based on data at the block group level from Replica Places, which is a high-fidelity activity-based travel model which includes trip origins and destinations. This criterion summarizes total daily trips, as well as the number of trips on transit. Trips are only counted if both the start and end locations are within a quarter mile buffer of the alignment. It includes trips between two block groups, or short trips which remain within a single block group.

Categorization: Comparative assessment of total trips, total transit trips, and transit mode share for each alignment.

ACCESSIBILITY – RIDERSHIP

Measure: This criterion measures the level of transit activity, and how that transit activity relates to total population and jobs.

Indicator: More ridership activity represents existing travel demand and supportive conditions for capital and service investments.

Data & Methodology: Ridership data is from Metro in Fall 2021. Four metrics were evaluated in total. The first two metrics measure how changing the alignment would impact existing riders. These metrics are focused on the single route that forms the corridor. They are:

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- Boardings along the existing route alignment
- Ridership along the existing route alignment as a percent of total route ridership

The second two metrics measure total ridership from all routes. This is meant to understand total ridership potential, and how ridership relates to the level of activity and demand. The metrics areas:

- Total boardings and alightings within a quarter mile of the alignment option
- Total boardings and alightings within a quarter mile of the alignment option as a ratio to the total population and jobs within a quarter mile.

Categorization: Comparative assessment of ridership metrics.

INFRASTRUCTURE AND COSTS – TROLLEY WIRE INFRASTRUCTURE

Measure: This criterion summarizes the miles of trolley wire needed for the proposed alignments. This metric is only relevant for Routes 36/49 and Route 44, which are the only corridors that are powered with overhead trolley wires.

Indicator: Trolley wire and associated costs would increase the challenge associated with those alignments.

Data & Methodology: The total length of new trolley wire needed for each option is measured. A shorter length means lower capital costs. Capital costs were drawn from prior efforts, primarily Metro’s Trolley Expansion Strategic Plan (August 2022).

Categorization: Comparative assessment of new trolley wire costs.

INFRASTRUCTURE AND COSTS - INFRASTRUCTURE RISK

Measure: This criterion identifies infrastructure risks including structural concerns relating to pavement, significant layover, comfort station, turnaround issues, and other potential costs.

Indicator: Alignments with fewer risks will be preferred as the representative alignment for the corridor.

Data & Methodology: Prior studies and reports reviewed in the document review and staff or consultant team expertise.

Categorization: Comparative assessment of risk.

INFRASTRUCTURE AND COSTS – LOCAL SUPPORT

Measure: This criterion summarizes local support by identifying if an alignment is already identified in adopted planning documents. Additionally, feedback from Metro and local jurisdictions will be incorporated into this measure.

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Indicator: Alignments that are already in existing service or planning documents are preferred, unless there is a compelling reason to consider a new alignment.

Data & Methodology: Document review

Categorization: Comparative assessment

Corridor Screening Results

The summary of the corridor screening for each corridor option is shown in Figure 4. For all but one corridor, a single option was selected as the representative alignment to be advanced to the prioritization analysis. The Route 36/49 screening did not identify a conclusive alignment. It is recommended that both alignments to be advanced to the prioritization phase of the project. Additional details for each corridor are provided in the Corridor Screening Detail section.

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Figure 4 Summary of Corridor Screening

Metric	Route 36/49		Route 40 (North)		Route 40 (South)		Route 44		Route 150	
	Broadway	Route 36	Northgate Way	Meridian/ College	Pioneer Square	First Hill	UW Link Station	Children's Hospital	Downtown Seattle	Rainier Beach
Speed, Reliability, Schedule Adherence	-	✓	No difference		No difference		No difference		-	✓
Transit Network Value	New unique connection	Same network	No difference		No difference		No difference		✓	-
Current Demographics	No difference		✓	-	-	✓	✓	-	✓	-
Origin-Destination	✓	-	✓	-	-	✓	✓	-	✓	-
Ridership	-	✓	✓	-	-	✓	✓	-	✓	-
Trolley Wire Infrastructure	-	✓	NA	NA	NA	NA	✓	-	NA	NA
Infrastructure Risk	NA	NA	NA	NA	NA	NA	✓	-	NA	NA
Local Support	In planning documents	Existing alignment	In planning documents	Existing alignment	Existing alignment	Under internal Metro study	Existing alignment	In planning documents	Existing alignment	2050 Metro Connects
Advance to Prioritization	For further discussion		✓	-	-	✓	✓	-	✓	-

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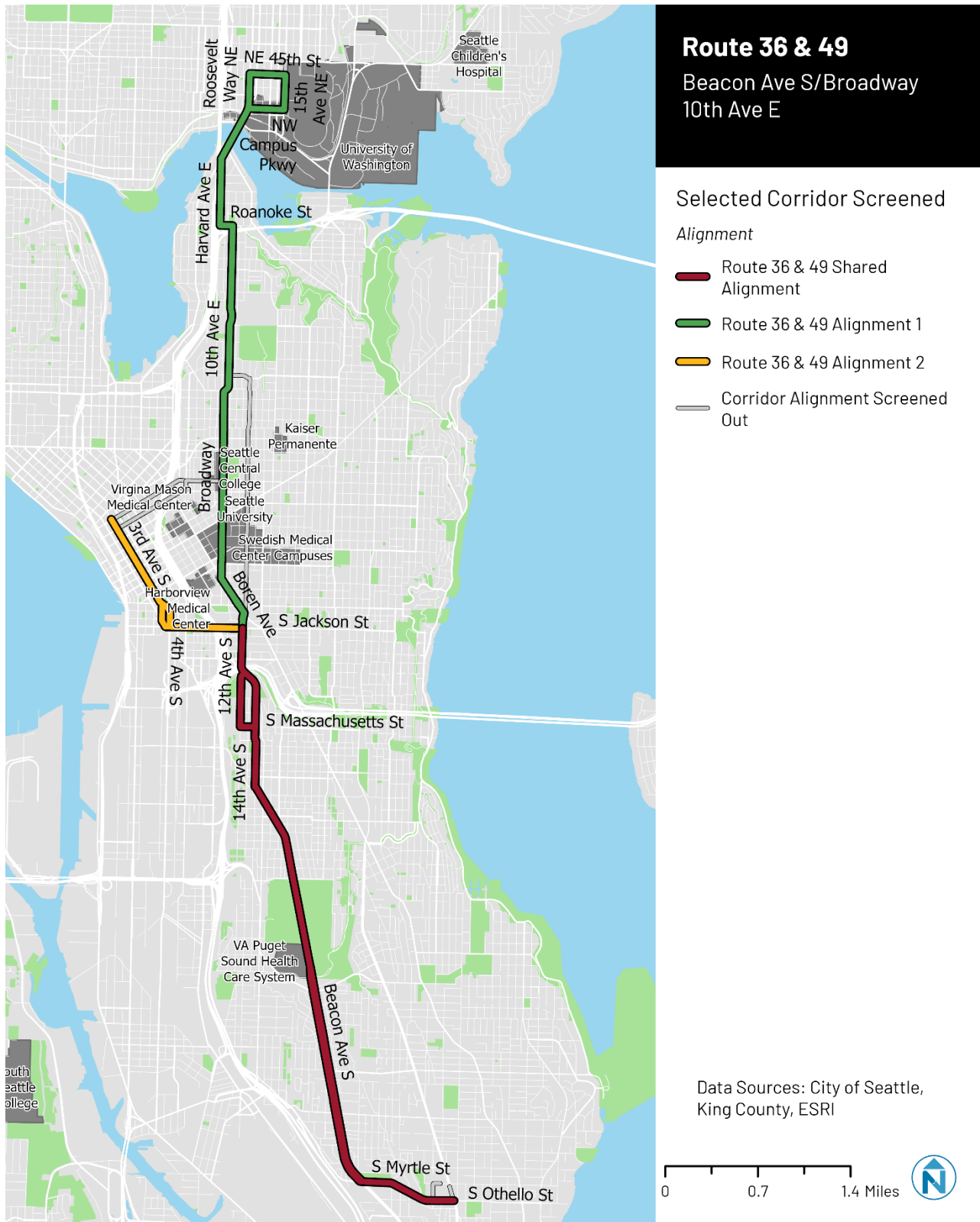
Representative Alignments

The following figures depict the alignment options for each corridor, including alignment or routing options that were eliminated prior to the screening process and those screened using the process described previously. A complete set of final representative alignments can be found on Remix at this [link](#).

All corridors have been narrowed to one representative alignment, with the exception for Route 36/49. Given the potential strengths of each alignment and unique nature of tradeoffs involved, the project team will consider options for carrying both alignments forward into the Corridor Study phase of the project.

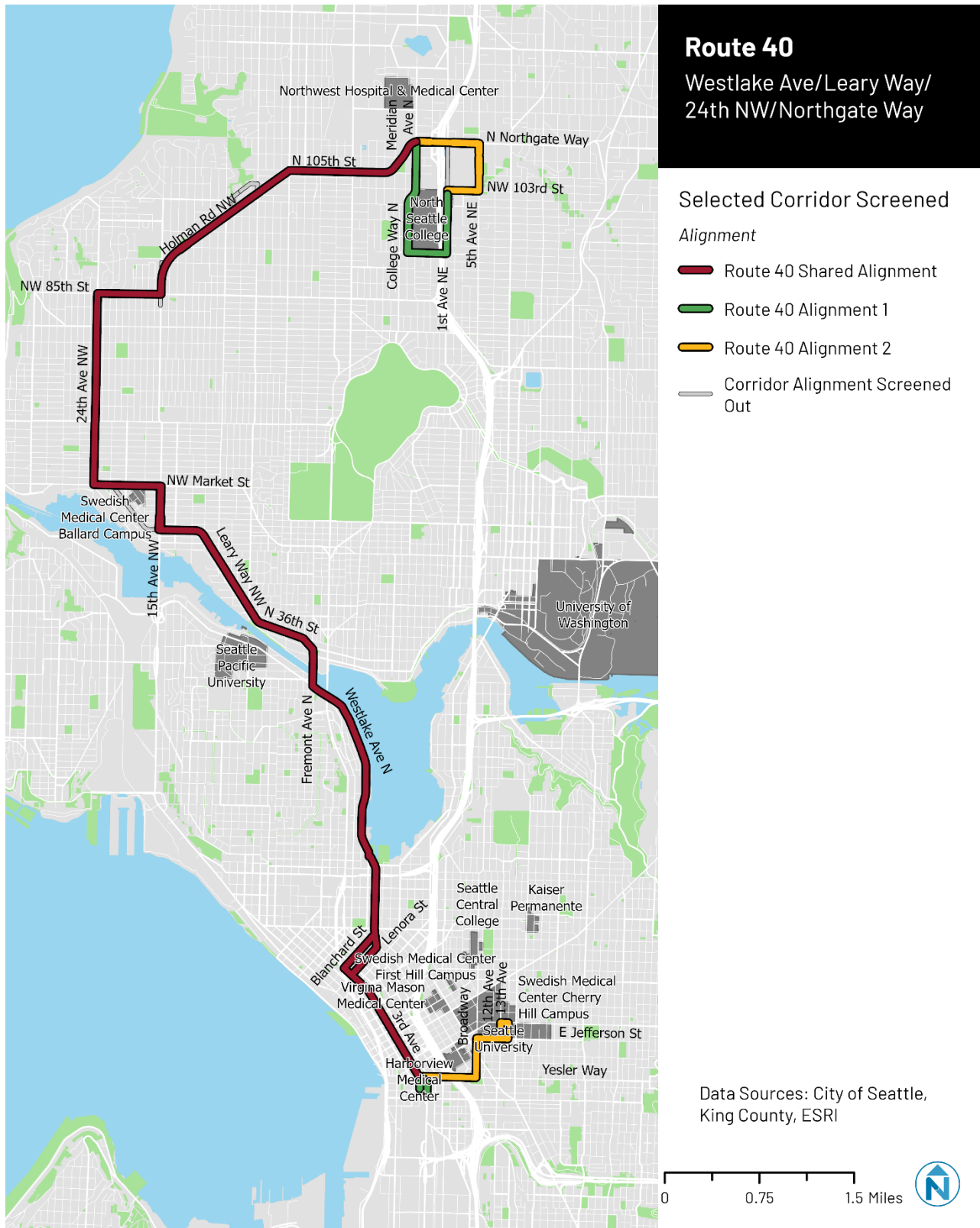
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Figure 5 Route 36 & 49 Alignment Options



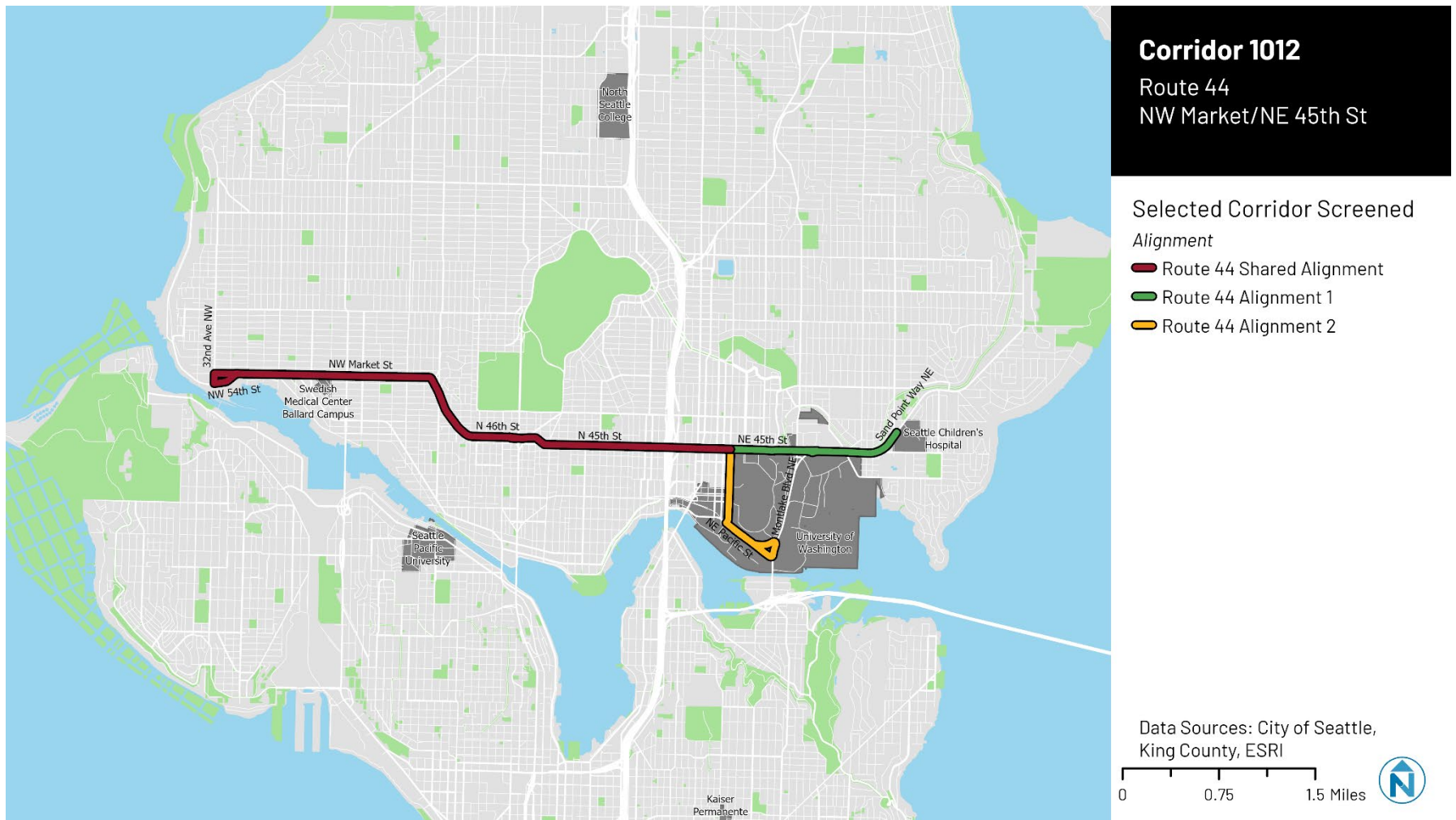
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Figure 6 Route 40 Alignment Options



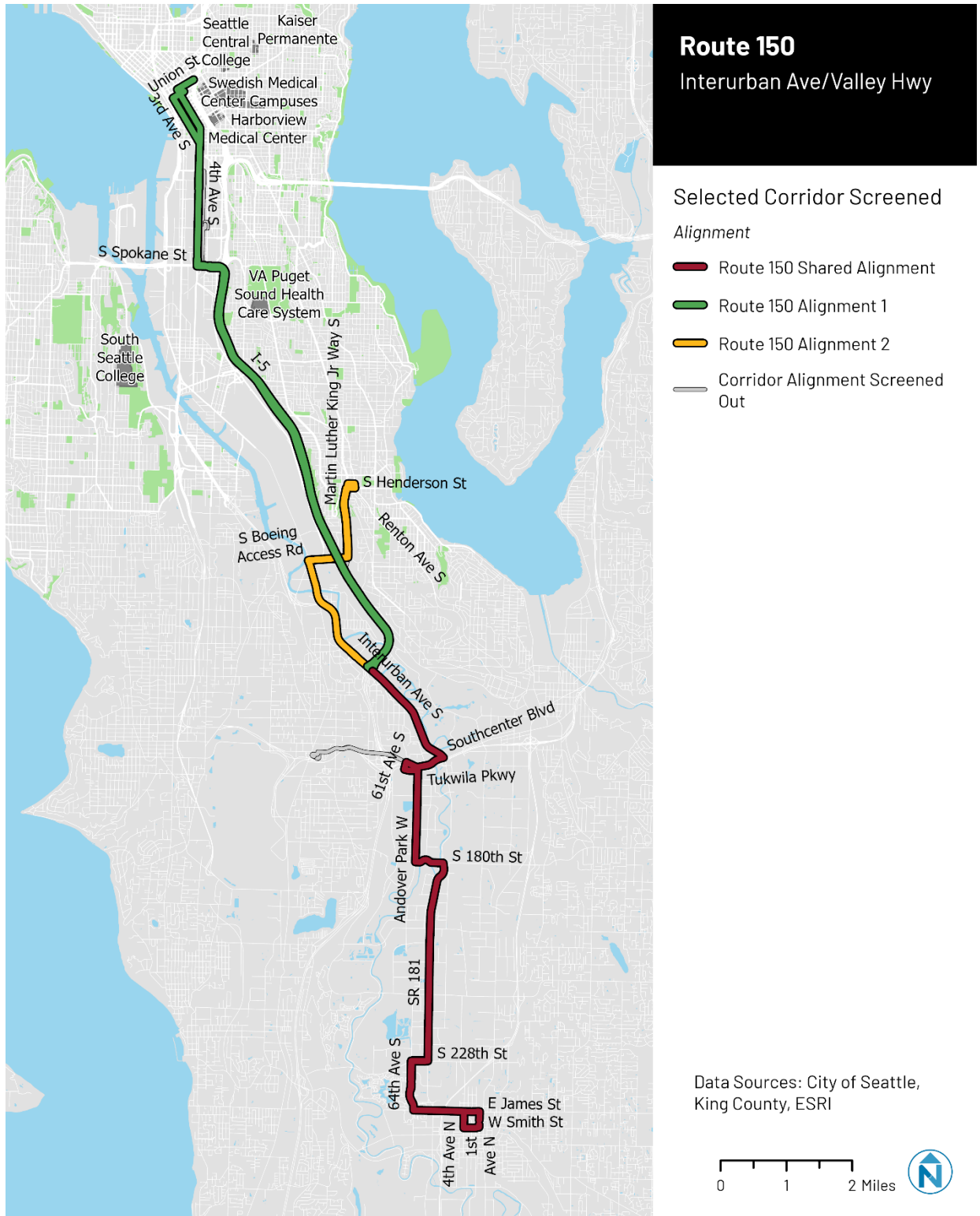
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Figure 7 Route 44 Alignment Options



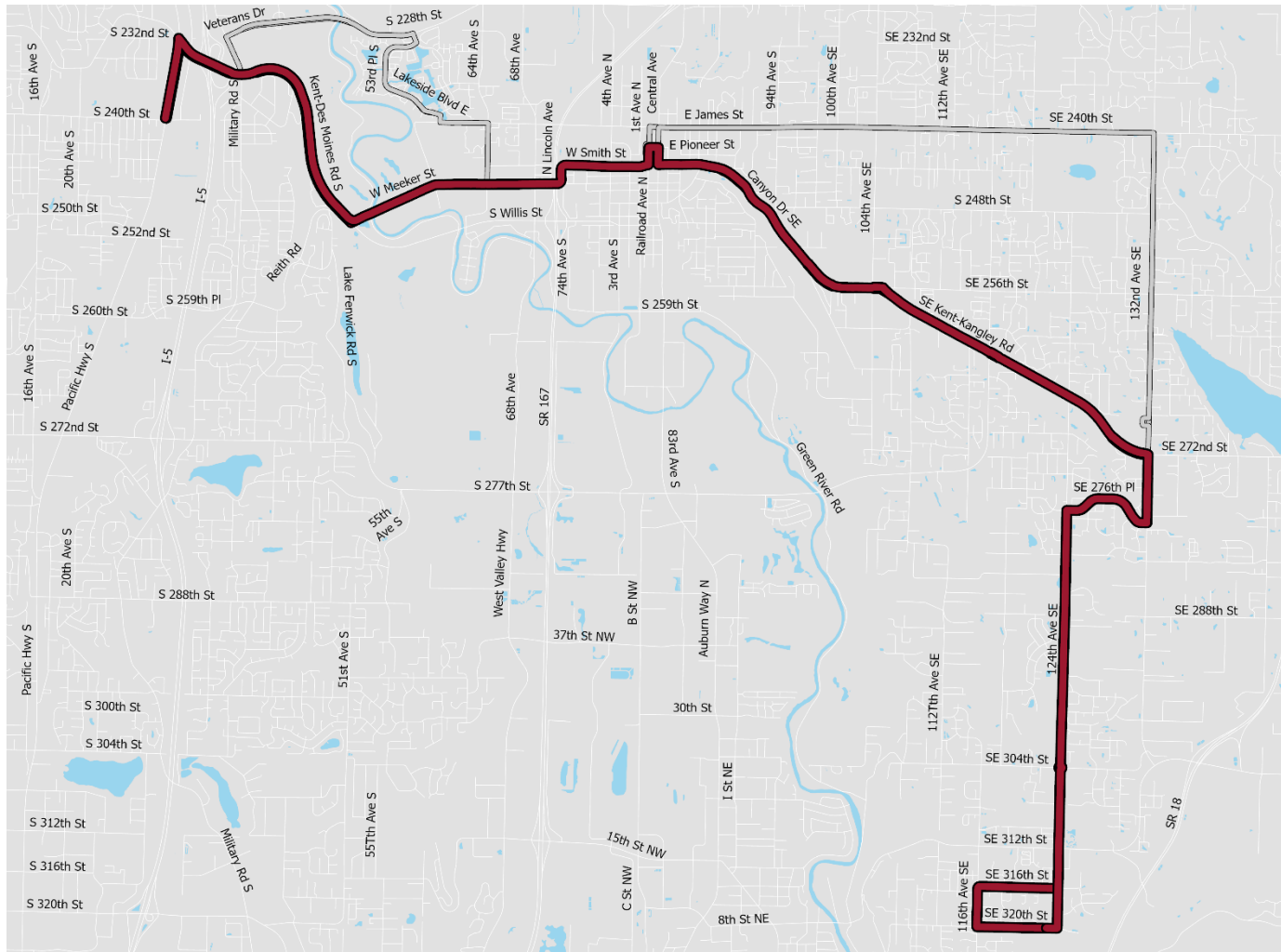
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Figure 8 Route 150 Alignment Options



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Figure 9 Route 165 Alignment Options



Route 165
 124th Ave SE/132nd Ave SE/
 SE 240th St

Selected Corridor Screened Out
 Alignment

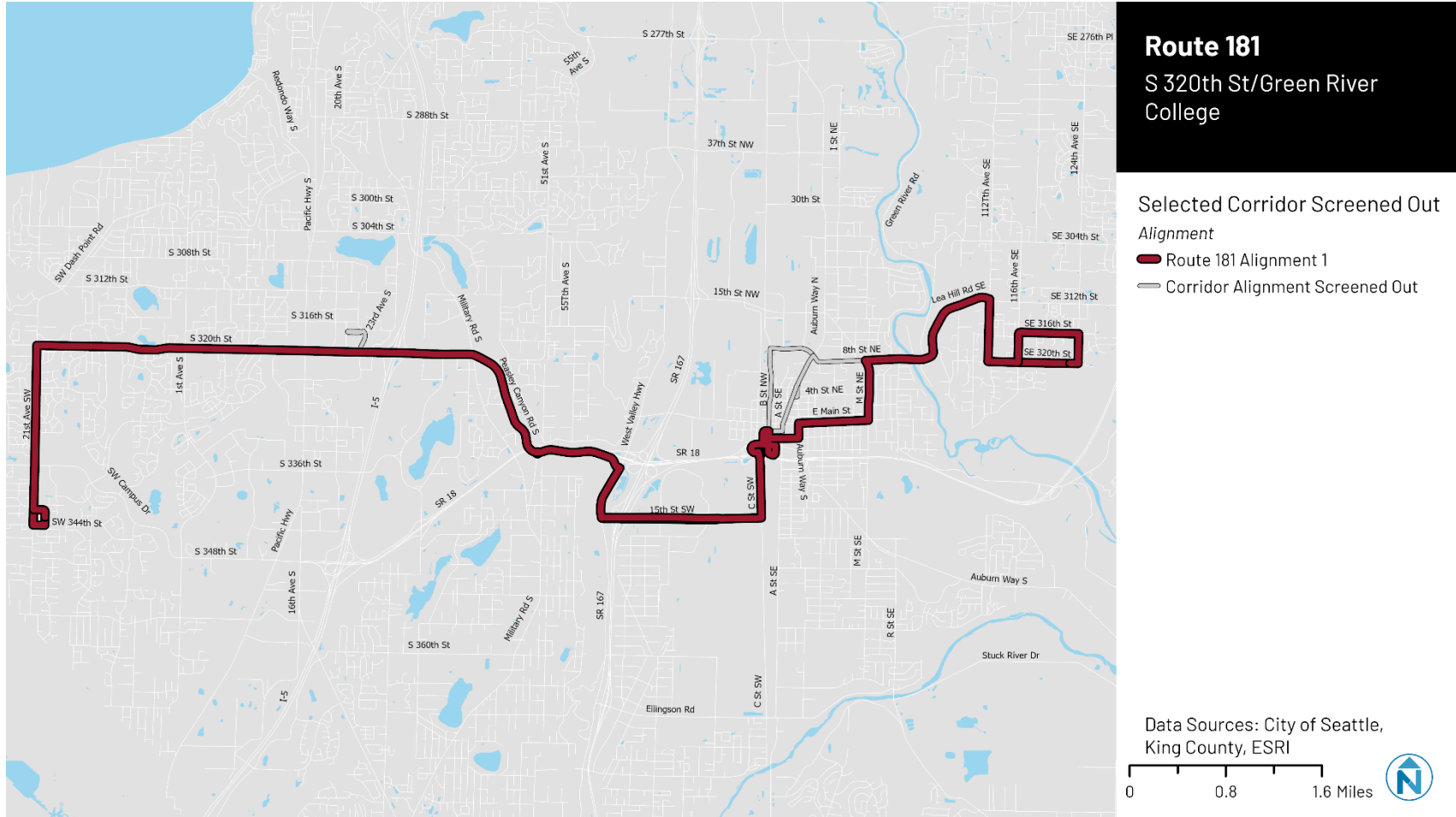
- █ Route 165 Alignment 1
- Corridor Alignment Screened Out

Data Sources: City of Seattle,
 King County, ESRI

0 0.7 1.4 Miles

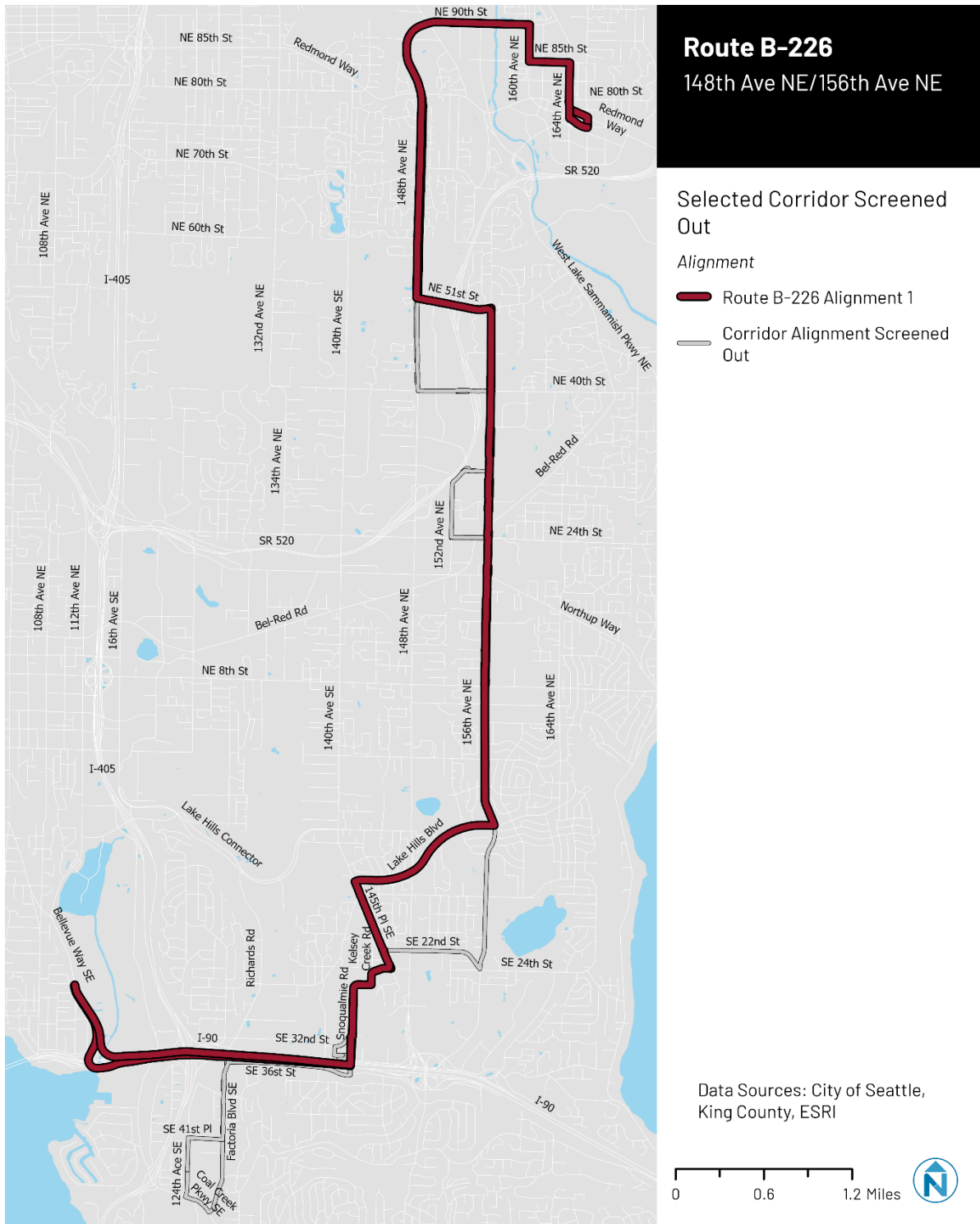
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Figure 10 Route 181 Alignment Options



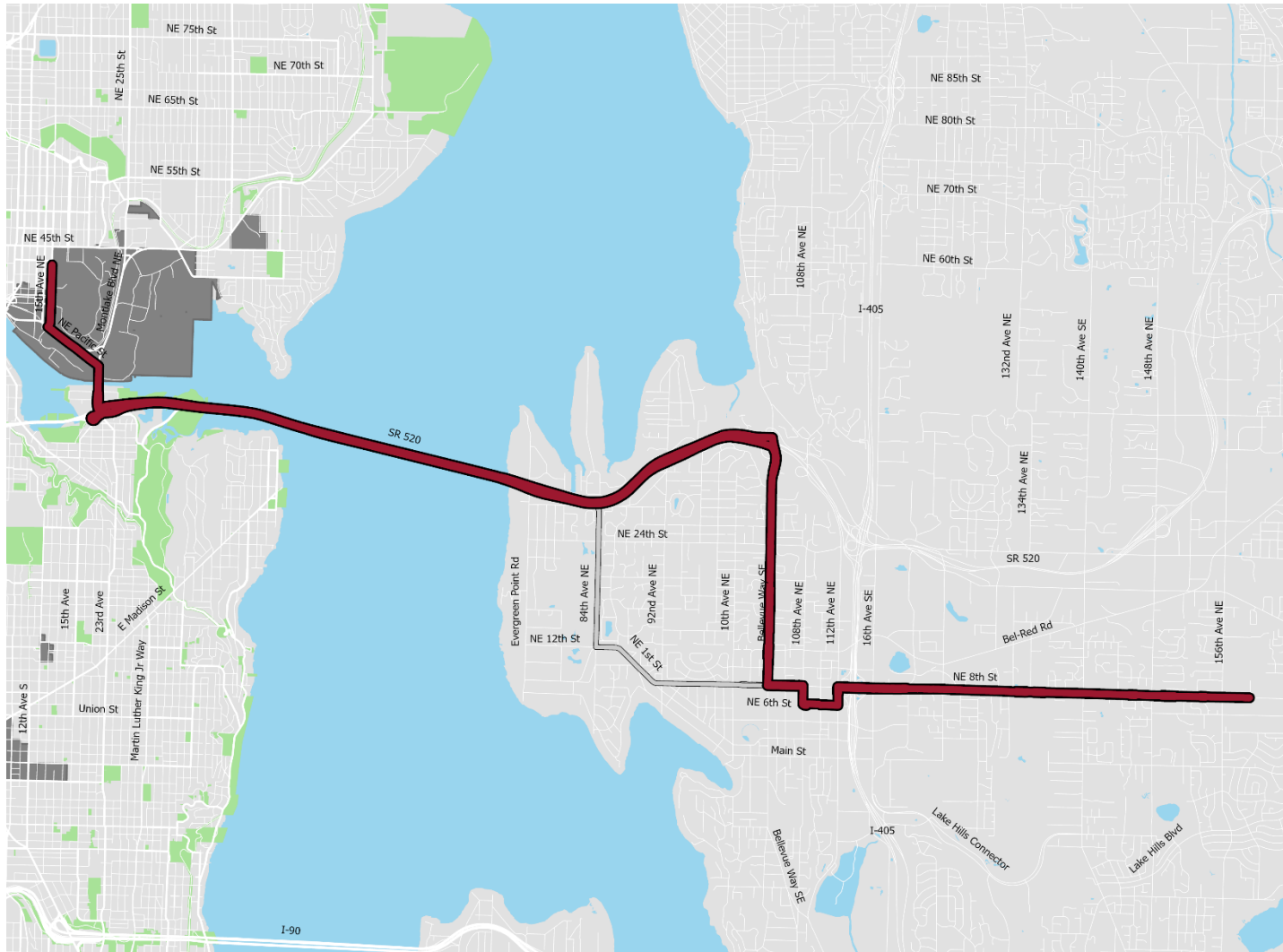
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Figure 11 B Line/Route 226 Alignment Options



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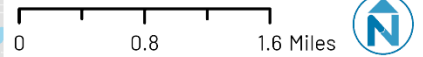
Figure 12 B Line/Route 271



Route B-271 U District/Bellevue/NE 8th St

- Selected Corridor Screened Out
Alignment
- Route B-271 Alignment 1
 - Corridor Alignment Screened Out

Data Sources: City of Seattle, King County, ESRI



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Corridor Screening Detail

Route 36/49

Two alignment options were identified: (1) through Downtown Seattle along the existing alignments, and (2) along Broadway through the First Hill neighborhood. An option to convert Route 36 to RapidRide, but leaving Route 49 as local service, was identified as a third option to advance to screening.

All options considered for the Route 36/49 corridor are listed in Figure 13.

The alignment via 12th Avenue in First Hill was eliminated due to the lack of trolley wire, and the high cost that would be necessary to install it. The option to combine both routes through downtown and the option to convert Route 49 to RapidRide were both eliminated because it would be duplicative with existing Link service and upcoming J Line service, both of which connect downtown and South Lake Union to the University District.

Figure 13 Route 36/49 Alignment Options

Alignment	Alignment Source	Initial Evaluation	Screening
Connect Routes 36 and 49 via Broadway in First Hill (Alignment A)	Metro Connects	Advance to screening	Advance to corridor study.
Convert Route 36 to RapidRide only (Alignment B)	Existing service	Advance to screening	Advance to corridor study.
Connect Routes 36 and 49 via Downtown	Existing service	Eliminate. Would be duplicative with Link and J Line	-
Connect Routes 36 and 49 via 12th Ave in First Hill	Seattle Transportation Plan	Eliminate. Extensive infrastructure needed.	-
Convert Route 49 to RapidRide only	King Co Metro	Eliminate. Would be duplicative with Link and J Line	-

SPEED, RELIABILITY, SCHEDULE ADHERENCE

These segments were identified as delay locations for the alignment option connecting Routes 36 and 49 (Alignment A):

- High delay: in U District along 15th Ave NE from NE 43rd St to NE Campus Pkwy; E Roanoke St from Harvard Ave E to 10th Ave E; 10th Ave/East Roy St/Broadway East/Boren Ave from E Aloha St to S Jackson St.

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- Moderate delay: Eastlake Ave NE from NE Campus Pkwy to E Hamlin St; 10th Ave E from E Roanoke St to E Boston St.
- Low delay: 10th Ave E from E Boston St to E Aloha St.

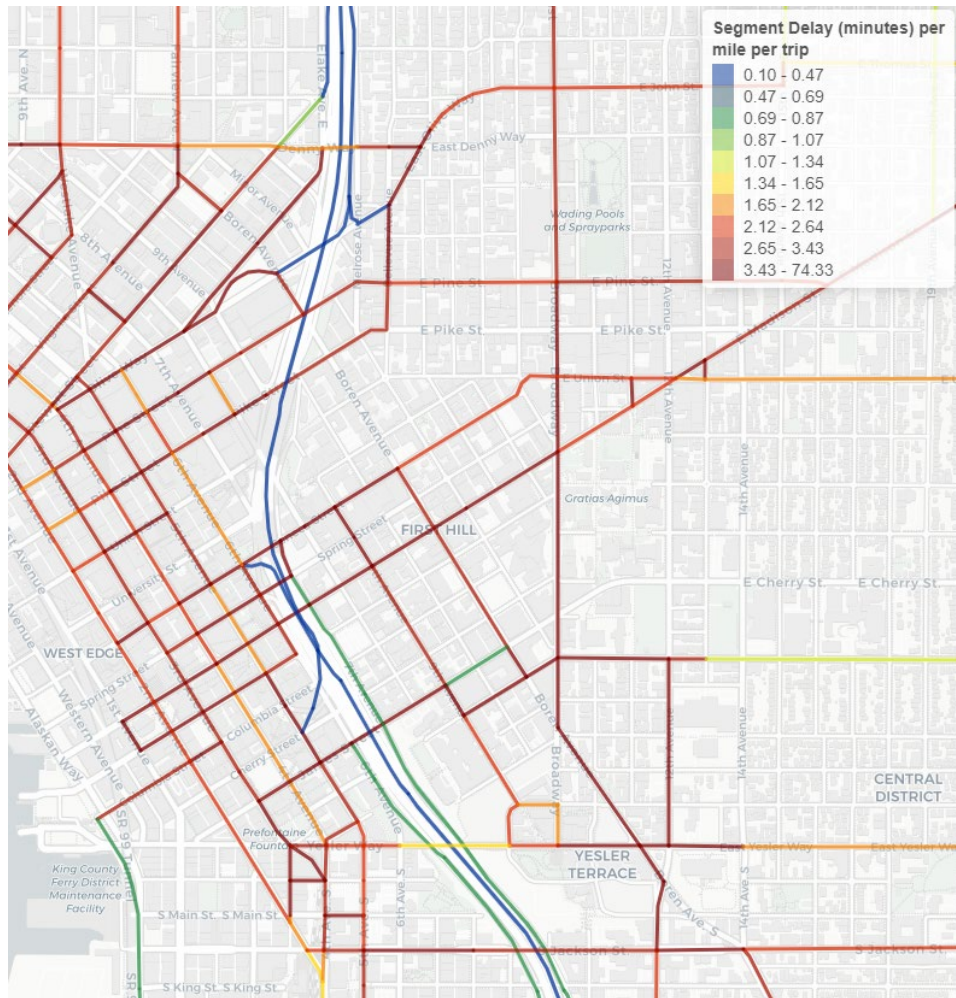
These segments were identified as delay locations for Alignment connecting Routes 36 to RapidRide only (Alignment B):

- High delay: 3rd Ave from Pine St to S Jackson St; along both 3rd Ave E and 4th Ave S; Jackson St from 4th Ave S to 12th Ave S.

There is no significant difference in delay locations between these two alignments. Alignment B is shorter in total length. Therefore, Alignment B’s percentage of delay locations is smaller, the operating cost is lower, and its route reliability is better.

In conclusion, Alignment B performs better in this criterion.

Figure 14 Bus Delay – Fall 2021 – Downtown / First Hill



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TRANSIT NETWORK VALUE

Alignment A would provide a new unique connection between Capitol Hill, First, Hill, CID, and Beacon Hill. Though Alignment A bypasses Downtown and offers a direct alignment from U District to Othello, future RapidRide J will connect U District to Downtown Seattle.

Alignment B provides connections directly to the Downtown transit network with numerous transfers and would serve future Pioneer Square Link transfer.

According to Figure 15, Alignment B provides better transfer connections.

Figure 15 Route 36/49 Alignment Options Transfers

	A: Connect Routes 36 and 49 via Broadway in First Hill	B: Convert Route 36 to RapidRide only
Number of Link Stations	2 (Capitol Hill Link, U District Link station)	4 (Othello, International District, Pioneer Square, University Street)
Number of Frequent Routes	10 (8, 10, 14, 20, 44, 48, 106, 255, 271, 372)	10 (5, 14, 21, 40, 49, 62, 101, 106, 124, 150)
Number of RapidRide lines	0	4 (C, D, E, H)

In conclusion, there is no significant difference between alignments based on this criterion.

CURRENT DEMOGRAPHICS

According to Figure 16, the area-weighted mean job scores are similar between the two alignments. The equity score of Alignment B is slightly better. Although there are more people along Alignment A, there are more jobs along Alignment B. Overall, there is no clear preference based on this criterion.

Figure 16 Route 36/49 Demographics

	A: Connect Routes 36 and 49 via Broadway in First Hill	B: Convert Route 36 to RapidRide only
Area-Weighted Mean Job Score	2.82	2.86
Area-Weighted Mean Equity Score	2.43	2.82
Population	75,833	41,208
Employment	128,681	196,209

ORIGIN-DESTINATION

According to Figure 17, despite Alignment B having a higher percentage of transit trips, Alignment A has much higher total trips along the corridor. Therefore, Alignment A performs better on this criterion.

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Figure 17 Route 36/49 Origin-Destination Trips

	A: Connect Routes 36 and 49 via Broadway in First Hill	B: Convert Route 36 to RapidRide only
Total Trips	52,374	37,587
Total Transit Trips	3,485	4,256
% Transit Trips	6.7%	11.3%

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Based on Figure 18, Alignment B performs better on this criterion because it has more ridership activity relative to the number of people who live and work along the alignment. Alignment B also has more ridership activity and covers more jobs and population.

Figure 18 Route 36/49 Ridership

		A: Connect Routes 36 and 49 via Broadway in First Hill	B: Convert Route 36 to RapidRide only
For current service alignments	Total boardings	3,653	2,612
	Total alightings	3,423	2,324
	Ridership activity as percent of route	42%	42%
For all alignments	Ridership	54,965	87,957
	Boardings and alightings per capita and worker	0.27	0.37

TROLLEY WIRE INFRASTRUCTURE

For Alignment A, the installation of 200 feet of new trolley wire is required. For Alignment B, no new trolley wire is required. For this criterion, Alignment B performs better.

INFRASTRUCTURE RISK

There are no identified risks for both alignments.

LOCAL SUPPORT

Alignment A is documented in prior planning efforts including Metro Connects and the City of Seattle Transportation Plan. Alignment B is the current service pattern for Route 36. Therefore, the alignments score similarly for local support.

CONCLUSION

As a conclusion, both routes offer unique strengths and it is difficult to select only one for additional analysis. In this case, both alignments should be carried forward to the corridor study and prioritization.

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Route 40

Multiple alignment options were identified for Route 40, including different alignments to access Northgate Station, through Ballard, and at the southern terminus. Multiple options were identified to truncate Route 40 and extend the existing D Line to Northgate Station. All options considered are listed in Figure 19.

Both Northgate alignments and the two southern termini were advanced to screening. The options to extend D Line to Northgate and truncate Route 40 were not advanced because they would change the scope of the analysis. The Ballard alignment via 15th Avenue was advanced because it would connect to the future Link station. All options are listed in Figure 19.

Figure 19 *Route 40 Alignment Options*

Alignment	Alignment Source	Initial Evaluation	Screening
Northern terminus			
Northgate Station	Existing alignment.	Representative alignment	-
NW 100th Place; extend D Line to Northgate	Consultant concept	Eliminate. Focus on Route 40 only.	-
15th Ave NW & Holman Rd NW; extend D Line to Northgate	Metro	Eliminate. Need to explore turnaround location.	-
Access to Northgate			
Via Meridian/College <i>(Alignment A)</i>	Existing alignment	Advance to screening	Not selected.
Via Northgate Way <i>(Alignment B)</i>	Metro Connects	Advance to screening	Selected as representative alignment.
Ballard alignment			
Via 15th Ave NW	Metro Connects	Representative alignment	-
Via Leary Way NW	Existing alignment	Eliminate. No connection to Link.	-
Southern terminus			
Pioneer Square <i>(Alignment A)</i>	Existing alignment	Advance to screening	Not selected.
First Hill <i>(Alignment B)</i>	Metro Connects	Advance to screening	Selected as representative alignment.

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ACCESS TO NORTHGATE

The following metrics and details are for the alignment to access Northgate Station, either via Meridian/College (existing alignment for Route 40 – referred to as Alignment A) or via Northgate Way (alignment identified in Metro Connects – referred to as Alignment B).

SPEED, RELIABILITY, SCHEDULE ADHERENCE

Along the alignment via Meridian and College, the delay ranged from high to low:

- High delay: 1st Ave NE from NE 92nd St to NE 103rd St.
- Moderate delay: N 92nd St from Corliss Ave N to 1st Ave NE.
- Low delay: Meridian Ave N/College Way N from NE Northgate Way to N 92nd St; N 92nd St from College Way N to Corliss Ave N.

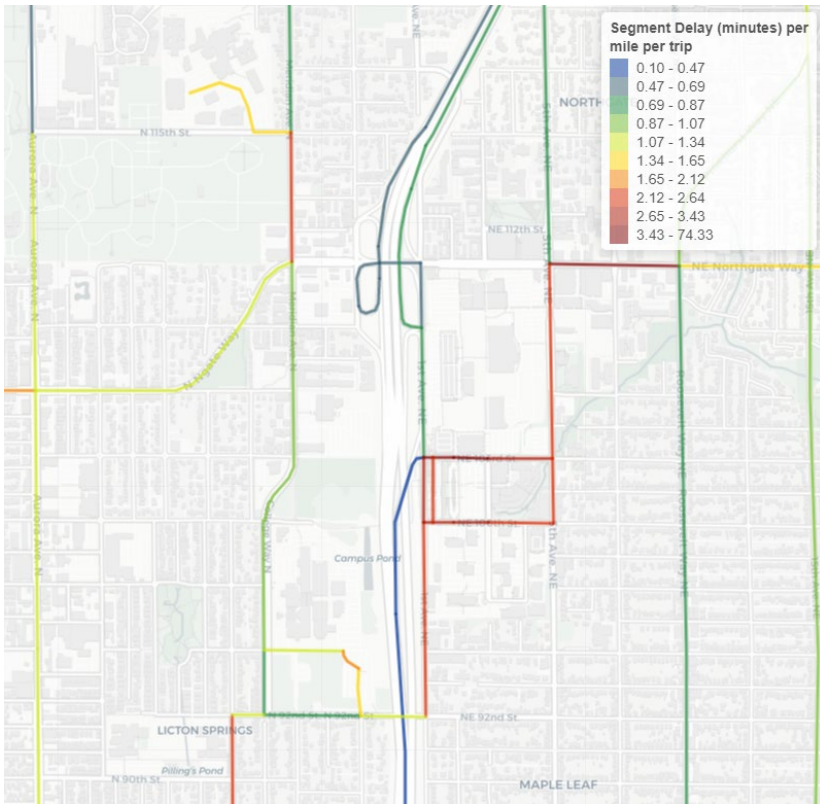
The alignment along Northgate Way (for the portions where data is available) was entirely high delay:

- High delay: 5th Ave NE from NE Northgate Way to NE 103rd St; 1st Ave NE from NE 103rd St to NE 92nd St.

Overall, there is no significant difference in delay locations between these two alignments as both alignments experience high delay for approximately the same distances.

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Figure 20 Bus Delay – Fall 2021 – Northgate



TRANSIT NETWORK VALUE

Alignment A uses the existing Route 40 alignment while Alignment B doesn't use the existing alignment. Both alignments have three turns when reaching Northgate. Additionally, according to Figure 21, both alignments have similar transfer opportunities. Therefore, Alignment A and B have no significant differences on their value to the transit network.

Figure 21 Route 40 North Alignment Options Transfers

	A: Via Meridian/College	B: Via Northgate Way
Number of Link Stations	1 (Northgate)	1 (Northgate)
Number of Frequent Routes	3 (20, 67, 75)	3 (20, 67, 75)
Number of RapidRide lines	0	0

CURRENT DEMOGRAPHICS

As shown in Figure 22, Alignment B has higher area-weighted mean job scores than Alignment A. The equity score of Alignment B is slightly better. There are marginally more people and jobs along the Northgate Way alignment. Overall, Alignment B performs better than A on this criterion.

RAPIDRIDE

Figure 22 *Route 40 North Demographics*

	A: Via Meridian/College	B: Via Northgate Way
Area-Weighted Mean Job Score	2.96	3.81
Area-Weighted Mean Equity Score	2.45	2.64
Population	7,015	7,801
Employment	5,124	6,137

RIDERSHIP

Based on Figure 23, Alignment B performs better on this criterion because Alignment B has more ridership activity relative to the number of people who live and work along the alignment. Alignment B also has more ridership activity and covers more jobs and population.

Figure 23 *Route 40 North Ridership*

		A: Via Meridian/College	B: Via Northgate Way
For current service alignments	Total boardings	222	
	Total alightings	306	NA
	Ridership activity as percent of route	5%	
For all alignments	Ridership	6,666	7,790
	Boardings and alightings per capita and worker	0.55	0.56

TROLLEY WIRE INFRASTRUCTURE

For both alignments, no new trolley wire is required.

INFRASTRUCTURE RISK

There are no identified risks for both alignments.

LOCAL SUPPORT

Alignment A is the current service pattern, while Alignment B is shown in Metro Connects. Therefore, the alignments score similarly for local support.

SOUTHERN TERMINUS

The following metrics and details are for the southern terminus alignments. Alignment A is the existing alignment to Pioneer Square, and Alignment B is a new terminus to First Hill.

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SPEED, RELIABILITY, SCHEDULE ADHERENCE

These segments were identified as delay locations for Alignment to Pioneer Square (Alignment A):

- High delay: along 3rd Ave S and 4th Ave S.

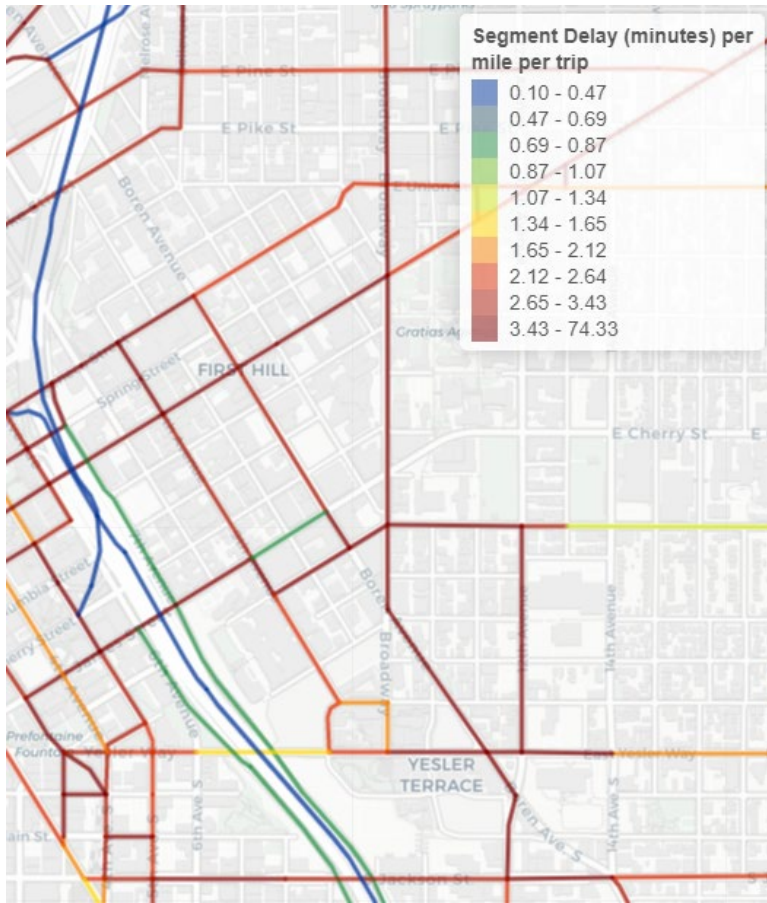
These segments were identified as delay locations for Alignment to First Hill (Alignment B):

- High delay: Yesler Way from 3rd Ave to 6th Ave; Yesler Way from 8th Ave to Broadway; Broadway from Yesler Way to E Jefferson St; E Jefferson St from Broadway to 13th Ave.
- Moderate delay: Yesler Way from 6th Ave to 8th Ave.

There is no significant difference in delay locations between these two alignments.

RAPIDRIDE

Figure 24 Bus Delay – Fall 2021 – First Hill



TRANSIT NETWORK VALUE

Alignment A uses the existing Route 40 alignment with a direct alignment with no turns or deviations. Alignment B has four turns along the way. Additionally, as shown in Figure 25, both alignments have similar transfer opportunities. Therefore, Alignment A and B have no significant differences on this criterion.

Figure 25 Route 40 South Alignment Options Transfers

	A: Pioneer Square	B: First Hill
Link Stations	0	0
Frequent Routes	12 (1, 2, 5, 7, 12, 14, 21, 62, 70, 101, 124, 150)	12 (1, 2, 5, 7, 12, 14, 21, 62, 70, 101, 124, 150)
RapidRide lines	4 (C, D, E, H)	4 (C, D, E, H)

RAPIDRIDE

CURRENT DEMOGRAPHICS

As shown in Figure 26, Alignment B has a higher job score and higher equity score than Alignment A.

Figure 26 Route 40 South Demographics

	A: Pioneer Square	B: First Hill
Area-Weighted Mean Job Score	2.37	3.55
Area-Weighted Mean Equity Score	1.92	2.84
Population	4,635	15,021
Employment	26,359	44,354

RIDERSHIP

As shown in Figure 27, Alignment B performs better on this criterion because Alignment B has more ridership activity and covers more jobs and population.

Figure 27 Route 40 South Ridership

	A: Pioneer Square	B: First Hill
For current service alignments	Total boardings	0
	Total alightings	0
	Ridership activity as percent of route	0%
For all alignments	Ridership	21,796
	Boardings and alightings per capita and worker	0.70
		27,837
		0.47

TROLLEY WIRE INFRASTRUCTURE

For both alignments, no new trolley wire is required.

INFRASTRUCTURE RISK

There are no identified risks for both alignments.

LOCAL SUPPORT

Alignment A is the existing service alignment to Pioneer Square. Due to an opportunity to put current out-of-service portions of the route into revenue service, Metro has been studying terminus options in First Hill, one of which is shown in Alignment B. Both options are considered to have local support.

NORTHERN AND SOUTHERN TERMINUS COMBINED

ORIGIN-DESTINATION

Due to the way trip origin-destination pairs are identified, the two Northgate options and both southern terminus options were combined to identify total trips that would be served by each potential combination. As shown in Figure 28, North B and South B combination has the highest total number of trips, transit trips, as well as transit trip share. Therefore, Alignment North B plus South B, via Northgate Way and First Hill scores best on this criterion among all combinations.

Figure 28 *Route 40 Combined Origin-Destination Trips*

Alignment Combination	Description	Total Trips	Total Transit Trips	% Transit Trips
North A <--> South A	Existing 40 alignment to Northgate and Pioneer Sq	108,491	4,573	4%
North A <--> South B	Existing 40 alignment to Northgate and First Hill	110,512	4,850	4%
North B <--> South A	Northgate Way and Pioneer Square	115,723	5,137	4%
North B <--> South B	Northgate Way and First Hill	128,007	6,089	5%

CONCLUSION

The best performing northern alignment option is via Northgate Way, whereas the best performing southern terminus is to First Hill. When paired together in a single corridor, it achieves the best origin-destination score. Therefore, the alignment running via Northgate Way and to First Hill will be the representative alignment for Route 40.

RAPIDRIDE

Route 44

Two alignment options for Route 44 were identified during the document review: one alignment would serve University of Seattle Children’s Hospital and the other alignment would serve University of Washington Link Station and the University of Washington Medical Center (which is the existing alignment). Both alignments were advanced to screening.

Figure 29 Route 44 Alignment Options

Alignment	Alignment Source	Initial Evaluation	Screening
Seattle Children’s Hospital (Alignment A)	Metro Connects	Advance to screening	Not selected.
University of Washington Link Station (Alignment B)	Existing alignment	Advance to screening	Selected as representative alignment.

SPEED, RELIABILITY, SCHEDULE ADHERENCE

These segments were identified as delay locations for the alignment from NE 45th Street and 15th Avenue to Children's Hospital (Alignment A):

- High delay: NE 45th St between 12th Ave NE to 22nd Ave NE; 25th Ave NE to 40th Ave NE.
- Moderate delay: 22nd Ave NE to 25th Ave NE.
- Low delay: Meridian Ave N/College Way N from NE Northgate Way to N 92nd St; N 92nd St from College Way N to Corliss Ave N.

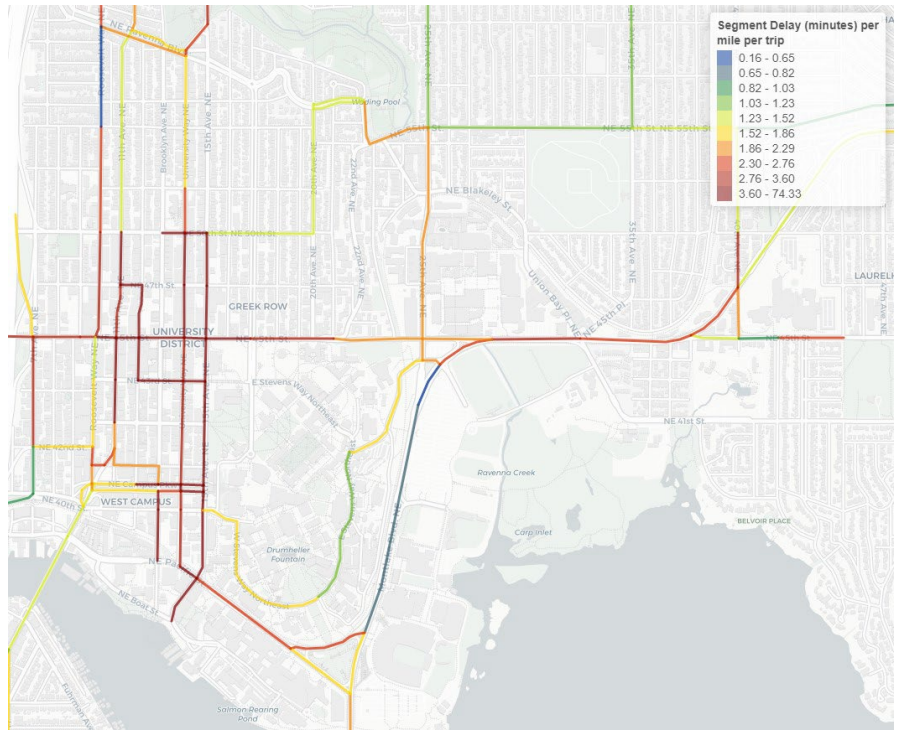
These segments were identified as delay locations for Alignment from NE 45th Street to UW Medical Center (Alignment B):

- High delay: NE 45th St between 12th Ave NE and 15th Ave NE; 15th Ave NE between NE 45th St and NE Pacific St.
- Moderate delay: NE Pacific St between 15th Ave NE and University of Washington Link Station.

There is no significant difference in delay locations between these two alignments.

RAPIDRIDE

Figure 30 Segment Delay – Fall 2021 – University District



TRANSIT NETWORK VALUE

Alignment A has a direct alignment with no turns or deviations and Alignment B has a less direct alignment. Both alignments would serve the U District Link Station. However, Alignment B serves an additional Link station at the University of Washington.

Additionally, as shown in Figure 31, both alignments have similar transfer opportunities. Therefore, Alignment A and B have no significant differences on this criterion.

Figure 31 Route 44 Alignment Options Transfers

	A: Seattle Children's Hospital	B: University of Washington Link Station
Number of Link Stations	1 (U District)	2 (U District and University of Washington)
Number of Frequent Routes	2 (65, 75)	0
Number of RapidRide lines	0	0

CURRENT DEMOGRAPHICS

According to Figure 32, Alignment B scores better than Alignment A on both job and equity scores. Alignment B also serves more jobs, yet both alignments serve very similar amounts of residents.

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Figure 32 Route 44 Demographics

	A: Seattle Children’s Hospital	B: University of Washington Link Station
Area-Weighted Mean Job Score	3.03	3.21
Area-Weighted Mean Equity Score	1.81	2.04
Population	49,837	48,461
Employment	20,727	34,658

ORIGIN-DESTINATION

According to Figure 33, despite Alignment B has higher total trips, transit trips, and transit trip percentages. Therefore, Alignment B performs better on this criterion.

Figure 33 Route 44 Origin-Destination Trips

	A: Seattle Children’s Hospital	B: University of Washington Link Station
Total Trips	36,245	43,576
Total Transit Trips	591	1,024
% Transit Trips	1.6%	2.3%

RIDERSHIP

Based on Figure 34, Alignment B performs better on this criterion because Alignment B has more ridership activity, and higher ridership per capita and worker.

Figure 34 Route 44 Ridership

	A: Seattle Children’s Hospital	B: University of Washington Link Station
For current service alignments	Total boardings	1,170
	Total alightings	908
	Ridership activity as percent of route	22%
For all alignments	Ridership	36,089
	Boardings and alightings per capita and worker	0.51

TROLLEY WIRE INFRASTRUCTURE

For Alignment A, the installation of three miles of new trolley wire would be required, which would cost approximately \$3.5 million to \$4.3 million. For Alignment B, no new trolley wire is required. For this criterion, Alignment B performs better.

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INFRASTRUCTURE RISK

According to SDOT Pavement Engineering and Management Section, there are concerns about frequent transit operations on NE 45th Street leading to increased wear and tear on the asphalt, which would lead to resurfacing costs. Therefore, Alignment B is better because there are no additional risks to provide service where it operates today.

LOCAL SUPPORT

Alignment A is documented in prior planning efforts including Metro Connects and the City of Seattle Transportation Plan. Alignment B is the current service pattern. The two alignments don't score very differently for local support.

CONCLUSION

Although Metro Connects identifies an alignment to Seattle Children's Hospital, the option to serve the University of Washington Link Station is recommended as the representative alignment because it scores better for most of the criteria.

RAPIDRIDE

Route 150

Multiple alignment options were identified for Route 150, including different alignments to connect Kent to Downtown Seattle, and Kent to Rainier Beach. There were multiple northern terminus options, different alignments through SODO, and two different ways to access I-5 in Tukwila. All alignments are listed in Figure 35.

The alignment connecting Downtown Seattle to Kent via Southcenter and Tukwila, and the alignment connecting Rainier Beach to Kent were advanced to screening.

Figure 35 Route 150 Alignment Options

Alignment	Alignment Source	Initial Evaluation	Screening
Northern terminus			
Downtown Seattle (Alignment A)	Existing alignment	Advance to screening	Selected as representative alignment.
SODO Station	Consultant concept	Eliminate. Avoid terminus just short of major destination.	-
Rainier Beach (Alignment B)	Metro Connects	Advance to screening	Not selected.
Tukwila International Boulevard Station	Consultant concept	Eliminate. Would serve different market.	-
SODO alignment			
Via 4th Ave S	Metro	Representative alignment	-
Via SODO busway	Existing alignment	Eliminate. Busway will be repurposed for Link in the future	-
Access to I-5			
Via Interurban Ave	Existing alignment	Representative alignment	-
Via Boeing Access Road	Metro	Eliminate. Limited value due to lack of destinations.	-

SPEED, RELIABILITY, SCHEDULE ADHERENCE

These segments were identified as delay locations for the alignment from Kent to Downtown Seattle (Alignment A):

- High delay: 3rd Ave S and 4th Ave S to Pike St and Pine St; 4th Ave S from S Lander St to Edgar Martinez Dr S.

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- Moderate delay: 4th Ave S from S Royal Brougham Way to S Jackson St; 4th Ave S from S Spokane St to S Lander St; 4th Ave S from Edgar Martinez Dr S to S Royal Brougham Way.
- Low delay: I-5 from Interurban Ave S to 4th Ave via W Seattle Bridge/S Spokane St.

These segments were identified as delay locations for the alignment from Kent to Rainier Beach (Alignment B):

- High delay: Interurban Ave S from I-5 to Gateway Dr S; S Henderson St from Martin Luther King Junior Way S to Renton Ave S to S Trenton St to Martin Luther King Junior Way S.

There is no significant difference in delay locations between these two alignments. However, Alignment B is shorter, with most of its alignment experiencing lower delay. Therefore, Alignment B is better at speed, reliability, and schedule adherence.

Figure 36 Bus Delay – Fall 2021 – Route 150



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TRANSIT NETWORK VALUE

Alignment A uses the existing Route 150 alignment, and Alignment B would change the northern terminus to Rainier Beach in South Seattle. Both alignments have relatively direct connections. Additionally, as shown in Figure 37, Alignment A has better transfer opportunities. Therefore, Alignment A performs better on this criterion.

Figure 37 *Route 150 Alignment Options Transfers*

	A: Downtown Seattle	B: Rainier Beach
Number of Link Stations	3 (King Street, Stadium, SODO)	0
Number of Frequent Routes	14 (1, 2, 5, 7, 12, 14, 21, 40, 50, 62, 70, 101, 124, 160)	2 (106, 160)
Number of RapidRide lines	5 (C, D, E, F, H)	1 (F)

CURRENT DEMOGRAPHICS

Figure 38 shows the demographic metrics for Route 150. Alignment A scores better than Alignment B on both job and equity scores and shows more people and jobs would be served.

Figure 38 *Route 150 Demographics*

	A: Downtown Seattle	B: Rainier Beach
Area-Weighted Mean Job Score	2.25	1.78
Area-Weighted Mean Equity Score	1.53	1.43
Population	30,482	17,651
Employment	181,839	36,619

ORIGIN-DESTINATION

As shown in Figure 39, Alignment A has much higher total trips, transit trips, and transit trip percentages. Therefore, Alignment A performs better on this criterion.

Figure 39 *Route 150 Origin-Destination Trips*

	A: Downtown Seattle	B: Rainier Beach
Total Trips	29,866	10,878
Total Transit Trips	1,447	21
%Transit Trips	4.8%	0.2%

RIDERSHIP

As shown in Figure 40, Alignment B performs better on this criterion because Alignment B has more ridership activity, and higher ridership per capita and worker.

RAPIDRIDE

Figure 40 Route 150 Ridership

		A: Downtown Seattle	B: Rainier Beach
For current service alignments	Total boardings	1,236	
	Total alightings	1,239	NA
	Ridership activity as percent of route	37%	
For all alignments	Ridership	75,539	11,986
	Boardings and alightings per capita and worker	0.36	0.22

TROLLEY WIRE INFRASTRUCTURE

For both alignments, no new trolley wire is required.

INFRASTRUCTURE RISK

There are no identified risks for both alignments.

LOCAL SUPPORT

Alignment A is the current service pattern and is reflected in the Metro Connects Interim Network. Alignment B is shown in the Metro Connects 2050 Network. Therefore both alignments are considered to have local support.

CONCLUSION

Based on the screening criteria, Alignment A (Kent to Seattle Downtown via Southcenter and Tukwila) is selected as the representative alignment for the Route 150 corridor because it scores better for most of the criteria.

RAPIDRIDE

Route 165

Route 165 operates between Burien and Green River College, passing through Des Moines, Kent and Auburn. However, the alignment assumed for future RapidRide service is between Highline College (in Des Moines) and Green River College. Two different alignment options were identified between Des Moines and Kent, and two alignment options east of downtown Kent. The options include the existing alignment, and the alignment identified in the RapidRide Expansion Program Corridor Evaluation Report.

The existing alignment between Des Moines and Kent does not have major trip generators and travels out-of-direction through lower density neighborhoods, whereas the alignment along Kent Des Moines Road and Meeker Street would provide more direct and faster service. This latter alignment was selected as the representative alignment.

The existing alignment east of downtown Kent operates along SE 240th Street and 132nd Ave SE. A more direct alignment along Canyon Drive and SE Kent Kangley Rd (SR 516) is identified in the RapidRide Expansion Program corridor evaluation report. The existing alignment lacks any major destinations, whereas the Expansion Program alignment is more direct. The alignment via Canyon Drive and SE Kent Kangley Road was selected as the representative alignment and no screening was performed.

Figure 41 *Route 165 Alignment Options*

Alignment	Alignment Source	Initial Evaluation	Screening
Western alignment			
Via Kent Des Moines Road and Meeker Street	RapidRide Expansion Program Corridor Evaluation Report	Representative alignment	-
Via Veterans Dr S, Lakeside Blvd and James Street	Existing alignment	Eliminate. Circuitous alignment and no major trip generators.	-
Eastern alignment			
Via Canyon Drive and SE Kent Kangley Road	RapidRide Expansion Program Corridor Evaluation Report	Representative alignment	-
Via James Street, SE 240th Street and 132nd Avenue SE	Existing alignment	Eliminate. Out-of-direction travel and no major trip generators	-

RAPIDRIDE

Route 181

Like Route 165, there were two distinct portions of Route 181 with multiple alignment options. One location is in Federal Way (whether to serve the Federal Way Transit Center or not), and the other is east of downtown Auburn (which street should be used to connect to 8th St NE).

Currently Route 181 serves the Federal Way Transit Center by deviating off S 320th Street. The Metro Connects alignment assumes this deviation goes away. Since the difference is minimal, it was not expected there would be sufficient differences at the screening state. The Metro Connects alignment was selected as the representative alignment.

Three alignments were identified for east of downtown Auburn. The existing alignment was identified as the representative alignment. The other two were eliminated due to no major trip generators and the fact that the alignment would serve a different market.

Figure 42 *Route 181 Alignment Options*

Alignment	Alignment Source	Initial Evaluation	Screening
Federal Way alignment			
Maintain direct service along S 320th Street	Metro Connects	Representative alignment	-
Deviation to Federal Way Station	Existing alignment	Eliminate: No major difference sufficient to assess at screening stage.	-
Auburn alignment			
Auburn alignment: Via Main Street and M Street NW	Existing alignment	Representative alignment	-
Auburn alignment: Via A Street NW, 10th Street NE, and 8th Street NE	Metro Connects	Eliminate. Minor out-of-direction travel and no major trip generators.	-
Auburn alignment: Via Auburn Avenue	RapidRide I Line alignment	Eliminate. Keep separate market.	-

RAPIDRIDE

B Line / Route 226

There were four different alignments considered for the B Line/226 corridor, with multiple options for each. Two options were identified in the Redmond Technology area (51st or 40th Street), two options in the Overlake area (direct along 156th Ave NE, or deviating to serve the Overlake Station), two options in South Bellevue to (via Lake Hills Boulevard or SE 22nd Street), and three different southern terminus options.

Each option was identified with a representative alignment during the initial evaluation, and no alignments were advanced to screening. The selected alignments are more direct, operate with less delay, or were more suited for RapidRide service. Figure 43 lists the detailed initial evaluation results.

Figure 43 *Route 226 Alignment Options*

Alignment	Alignment Source	Initial Evaluation	Screening
Redmond Technology alignment			
Via NE 51st Street	Metro Connects	Representative alignment	-
Via NE 40th Street	Existing alignment	Eliminate. Increased congestion and likelihood of delay.	-
Overlake alignment			
Via 156th Ave NE	Metro Connects	Representative alignment	-
Via NE 31st Street, 152nd Avenue NE, NE 24th Street	Existing alignment	Eliminate. Out-of-direction travel. Duplicative access to Link.	-
South Bellevue alignment			
Via Lake Hills Boulevard	Bellevue Transit Master Plan	Representative alignment	-
Via SE 22nd Street	Metro Connects	Eliminate. Narrow corridor with poor land use	-
Southern Terminus			
South Bellevue Station	Metro Connects	Representative alignment	-
Eastgate Park and Ride	Metro Connects	Eliminate. No major high-capacity transit connection expected in medium term.	-
Factoria	Bellevue Transit Master Plan	Eliminate. Need to explore turnaround location.	-

RAPIDRIDE

B Line / Route 271

There were two alignments identified for this corridor. The difference is which roads are used to connect SR-520 and Downtown Bellevue. The existing alignment of Route 271 and the Metro Connects alignment both follow 84th Avenue NE and NE 8th Street. However, during the East Link network restructure, a new alignment along Bellevue Way NE was selected to connect SR-520 and NE 8th Street (for Route 270, which will replace Route 271).

To maintain consistency with the alignments already chosen as part of the restructure, the alignment along Bellevue Way NE was selected. It was advanced as the representative alignment without any screening.

Figure 44 *Route 271 Alignment Options*

Alignment	Alignment Source	Initial Evaluation	Screening
U District to Crossroads via Bellevue Way NE and Downtown Bellevue	East Link restructure	Representative alignment	-
U District to Crossroads via 84th Ave NE and Downtown Bellevue	Existing alignment and Metro Connects	Eliminate. Maintain the alignment identified as part of the East Link network restructure.	-