

# Appendix G. RapidRide Expansion Report

## Background

RapidRide is Metro's Bus Rapid Transit (BRT) service program. This successful program provides frequent service and enhanced customer amenities in major travel corridors. Compared to the bus routes they replaced, the RapidRide A to F lines combined carry about 50 percent more riders – about 60,000 passenger trips per weekday. In addition, travel time is as much as 20 percent faster, with most lines saving one to five minutes per trip.

As part of the budget planning process for the 2017-2018 biennial budget, the Service Development and Strategy and Performance groups were asked to develop a preliminary proposal for expanding the RapidRide program beyond the City of Seattle's Move Seattle initiative.

The following factors were considered in identifying corridors that may be appropriate for RapidRide:

- Creating an interconnected network of bus rapid transit throughout the County
- Performance of underlying routes and/or route segments
- Geographic distribution
- Social Equity
- Designated Speed and Reliability Corridors
- Integration with ST2 and projected ST3 projects
- Integration with the Move Seattle Initiative
- Integration with Metro's Long Range Planning efforts

This report analyzes frequent corridors identified in METRO CONNECTS for potential RapidRide lines. More information on how the METRO CONNECTS 2040 service network was developed can be found in the METRO CONNECTS Appendix A. Candidate RapidRide lines are identified as either near-term (~2025) or long-term (~2040). Candidate RapidRide lines within the City of Seattle match those identified in the Seattle Transit Master Plan.

## Assessing Candidate RapidRide Lines

### Evaluation

To identify candidate RapidRide lines for the 2025 and 2040 network vision, a variety of factors were taken into account. The frequent service network in METRO CONNECTS, which has been coordinated with local jurisdiction transit plans, was considered the starting point for potential future RapidRide lines. In general, frequent service in METRO CONNECTS was selected for high ridership route segments connecting numerous destinations along a route, and where additional growth is planned in the future.

Measures of productivity, social equity, and geographic value were all used to determine which routes within METRO CONNECTS should be designated for future RapidRide investments. These measures expand on what is used in the Metro's Service Guidelines and the 2014 King County Metro RapidRide Performance Evaluation Report (Table G-1). Half-mile buffers were used instead of quarter-mile buffers when running many of the calculations. This

is consistent with the idea that high quality and very frequent transit is more capable of attracting riders from a larger catchment area. Each above measure was selected to provide insight into the productivity, social equity, and geographic value of each corridor.

**Table G-1 RapidRide Evaluation Measures**

Factor	Measure
Productivity	Existing Employment Density
	Existing Population Density
	Existing Boardings / Hour
	2040 Estimated Employment Density
	2040 Estimated Population Density
Social Equity	Population below Poverty
	Minority Population
Geographic Value	Number of centers connected
	Major transfer points and hubs connected

Each corridor is designated as “urban” or “suburban” as defined by Metro’s service guidelines, and is identified as either a candidate RapidRide corridor or an existing RapidRide Route. For each measure, the corridors are ranked on a scale of high, medium or low performance. High indicates that a corridor scored in the top 25 percent of its Urban or Suburban designation. Medium indicates that a corridor scored less than the top 25 percent, but greater than the bottom 25 percent. Low means that a corridor scored in the bottom 25%.

The measures used to evaluate Candidate RapidRide routes are described on the next page.

**Current Productivity**

- Existing Employment Density
  - Current estimated population within a half-mile buffer of each corridor divided by the length of the corridor. Used 2012 Longitudinal Employer-Household Dynamics data.
- Existing Population Density
  - Current estimated jobs within a half-mile buffer of each corridor divided by the length of the corridor. Used 2013 American Community Survey data.
- Existing Boardings / Hour
  - The average number of daily boardings on weekdays in spring 2015 on the existing underlying route(s) – no truncation – for each METRO CONNECTS route. Average weekday daily boardings are divided by the daily revenue hours for each existing route to get Daily Boardings/Hour.

### ***2040 Productivity***

- 2040 Employment Density
  - 2040 estimated jobs within a half-mile buffer of each corridor divided by the length of the corridor.
- 2040 Population Density
  - 2040 estimated population within a half-mile buffer of each corridor divided by the length of the corridor.

### ***Social Equity***

- Population below Poverty
  - Used census data from the 2013 American Community Survey, based on a 5-year period from 2008 - 2013 to calculate people per square mile falling below the nationwide poverty level. A half-mile "as the crow flies" buffer is used to determine what percentage of a census block falls within a half-mile of the corridor. The percentage of each census block that is overlapped by the half-mile buffer is multiplied by the number of people in poverty in each census block. The result is an estimated total number of people in poverty within a half-mile of the corridor. This estimate is then divided by the total current estimated population within the half-mile buffer to get a percentage.
- Minority Population
  - Used census data from the 2013 American Community Survey, based on a 5-year period from 2008 - 2013 to calculate people per square mile who are non-white of Hispanic origin. A half -mile "as the crow flies" buffer is used to determine what percentage of each census block falls within a half mile of the corridor. The percent of each census block that is overlapped by the half mile buffer is multiplied by the total number of minorities in each census block. The result is an estimated total number of minorities within a half-mile of the corridor. This estimate is then divided by the total current estimated population within the half-mile buffer to get a percentage.

### ***Geographic Value***

- Centers Connected
  - Number of Urban, Manufacturing, Industrial, and Activity Centers within a half mile of a corridor.
- Major Transfer Points and Hubs Connected
  - Number of Park & Rides, Transit Centers, Sounder Stations, and Link Stations (current, planned and proposed) that are on a corridor.

## Findings and Discussion

**Table G-2 2025 RapidRide Candidate Lines**

Urban or Suburban	LRP ID #	To / From / Via	Comparable Route(s)	One-Way Miles	Productivity			Equity		Geographic Value	
					Current Boardings /Hour	Current people /mile	Current jobs /mile	Percent Poverty	Percent Minority	Number of Centers	Transfer Points & Hubs
Urban	RR 40	Lake City - Seattle CBD - Ballard	40	13.7	Low	Medium	Medium	Low	Medium	High	High
	RR 120	Burien TC - Seattle CBD - Westwood Village	120	13.0	Medium	Low	Medium	Medium	High	Medium	Medium
	1002	Richmond Beach - UW - 15th Ave NE	73, 373, 348	12.1	Low	Low	Low	Medium	Medium	Medium	Medium
	1009	Bothell - UW - Lake City	372	14.8	Low	Low	Low	Medium	Medium	Medium	Medium
	1012	Ballard - Children's Hospital - Wallingford	44	5.9	High	High	Medium	Medium	Low	Medium	Low
	1013	Northgate - Mount Baker - Seattle CBD	67, 70	7.1	Medium	High	High	Medium	Medium	Medium	Medium
	1014	Loyal Heights - U. District - Green Lake	45	6.5	High	Medium	Medium	Medium	Low	Medium	Medium
	1059	Madison Valley - Seattle CBD - E Madison St	11, 12	2.4	Medium	High	High	Medium	Medium	Low	Low
	1061	Uptown - Madison Park - Capitol Hill	8, 11	7.6	Medium	Medium	Medium	Low	Low	Low	Medium
	1063	U. District - Rainier Beach - Mount Baker	7s, 48	10.7	Medium	Medium	Low	High	High	Medium	Medium
	1064	U. District - Othello - Beacon Hill	36, 49	10.1	Medium	Medium	Medium	High	High	Medium	Medium
	1071	U. District - Mount Baker - Seattle CBD	7n, SLU	4.8	Medium	High	High	High	High	Medium	Medium
	1202	Sand Point - Seattle CBD - Green Lake	62	11.3	Low	Medium	Medium	Low	Low	Medium	High
	1996	U. District - Northgate - Lake City	75	10.1	Medium	Low	Low	High	Medium	Medium	Medium
	Current RapidRide	C Line	SLU - Westwood - West Seattle	C	10.8	Medium	Medium	Medium	Medium	Medium	Medium
D Line		Crown Hill - Seattle CBD - Ballard	D	9.2	High	Medium	High	Low	Medium	Medium	Medium
E Line		Shoreline - Seattle CBD - SR-99	E	13.1	High	Medium	Medium	Medium	Medium	Medium	High
Suburban	1025	Kenmore - Overlake - Totem Lake	234, 235	15.7	Low	Medium	Medium	Low	Low	Low	Low
	1027	Totem Lake - Eastgate - Bellevue	234, 235, 271	14.6	Low	Medium	High	Low	Low	Medium	High
	1028	Crossroads - Bellevue - NE 8th St	B South	3.3	High	High	High	Medium	Medium	Low	Low
	1030	Overlake - Renton - Newcastle	240, 245	17.7	Medium	Low	Medium	Medium	Medium	High	Medium
	1033	Renton - Auburn - Kent	169, 180	16.5	Medium	Medium	Medium	Medium	High	Medium	High
	1037	Kirkland - Eastgate - Overlake	221, 245	10.8	Low	Medium	Medium	Low	Medium	Low	Medium
	1052	Twin Lakes - Green River CC - Federal Way	181	13.9	Medium	Low	Low	Medium	Medium	Medium	Medium
	1056	Highline CC - Green River CC - Kent	164, 166	11.9	Medium	Medium	Low	High	Medium	Low	Low
	1215	Kenmore - Shoreline - North City	331	8.9	Low	Medium	Low	Medium	Low	Medium	Low
	1514	Covington - SeaTac - Kent	180, 168	16.5	Medium	Low	Low	Medium	Medium	Medium	Medium
	Current RapidRide	A Line	SeaTac - Federal Way - Des Moines	A	12.0	High	High	Medium	High	High	Medium
B Line		Redmond - Bellevue - Overlake	B	9.9	High	High	High	Low	Medium	Medium	Medium
F Line		Renton - Burien - Tukwila	F	12.9	Medium	Low	Medium	High	High	Medium	Medium

The 23 candidate RapidRide lines identified for this near-term analysis were drawn from the 2025 frequent service network in METRO CONNECTS. To compare and discuss the merits of each candidate, the productivity, social equity, and geographic value of each corridor were calculated (as shown in the above matrix with different shades of green).

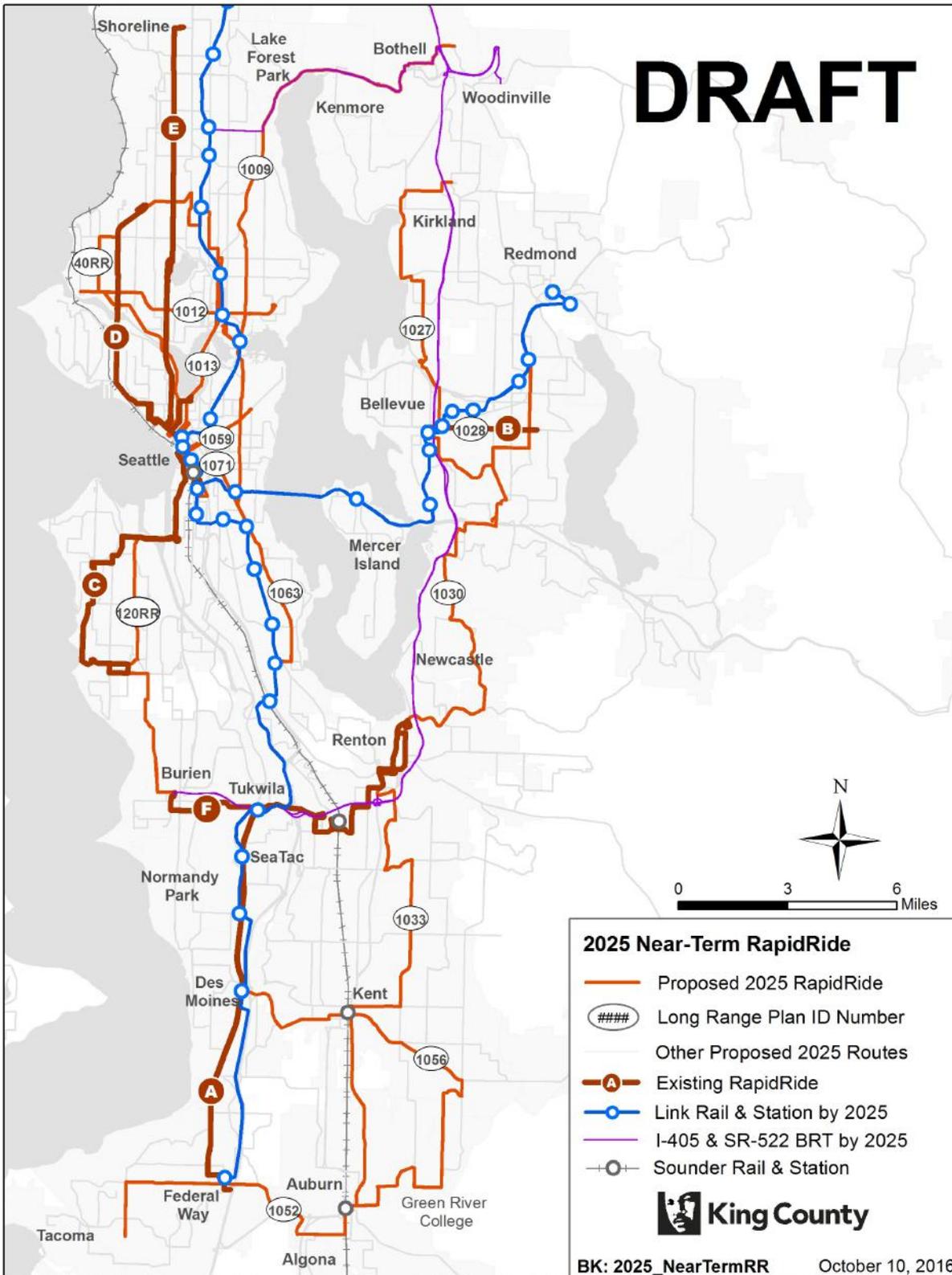
There are 13 proposed new near-term 2025 RapidRide lines and six existing RapidRide routes in Table G-3. As Metro begins work on new RapidRide lines, Metro will work closely with cities and the public to plan alignments, stop and station locations, and connecting service. Sequencing of these lines will depend on when other large transportation projects are planned to be implemented within the region and when funding becomes available. The exact pathways of proposed lines may change in the design and implementation process, which includes Metro's regular service change process.

**Table G-3 Proposed 2025 RapidRide Lines**

LRP Route ID	Comparable Route(s)	To / From / Via	One-Way Miles	Urban (U) or Suburban (S)
<b>1009</b>	372	Bothell - UW - Lake City	15	U
<b>RR 40</b>	40	Lake City - Seattle CBD - Ballard	14	U
<b>1012</b>	44	Ballard - Children's Hospital - Wallingford	6	U
<b>1013</b>	67, 70	SLU - Northgate - Eastlake	7	U
<b>1027</b>	234, 235, 271	Totem Lake - Eastgate - Bellevue	15	S
<b>*1028 (B Line)</b>	B South	Crossroads – Bellevue – NE 8 <sup>th</sup> St	3	S
<b>1030</b>	240, 245	Overlake - Renton - Newcastle	18	S
<b>1033</b>	169, 180	Renton - Auburn - Kent	16	S
<b>RR 120</b>	120	Burien TC - Seattle CBD - Westwood Village	13	U
<b>1056</b>	164, 166	Highline CC - Green River CC - Kent	12	S
<b>1059</b>	11, 12	Madison Valley - Seattle CBD - E Madison St	2	U
<b>1063</b>	7s, 48s	U. District - Rainier Beach - Mount Baker	11	U
<b>1071</b>	7n, SLU	SLU- Mount Baker - Seattle CBD	5	U
<b>1052</b>	181	Twin Lakes - Green River CC - Federal Way	14	S
<b>A Line</b>	A	SeaTac - Federal Way - Des Moines	12	S
<b>C Line</b>	C	SLU - Westwood - West Seattle	11	U
<b>D Line</b>	D	Northgate - Seattle CBD - Ballard	9	U
<b>E Line</b>	E	Shoreline - Seattle CBD - SR-99	13	U
<b>F Line</b>	F	Renton - Burien - Tukwila	13	S

\*Includes changes to a current RapidRide Lines

**Figure G-1 Map of 2025 Proposed RapidRide Network**



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**Table G-4 2040 RapidRide Candidate Lines**

2025 Proposed & 2040 Candidates	Urban or Suburban	LRP ID #	To / From / Via	Comparable Route(s)	One-Way Miles	Productivity			Equity		Geographic Value	
						Current Boardings /Hour	2040 people /mile	2040 jobs /mile	Percent Poverty	Percent Minority	Number of Centers	Transfer Points & Hubs
By 2025 Proposed RapidRide Lines	Urban	1001	Shoreline - Seattle CBD - SR-99	E	12.8	High	Medium	High	Low	Medium	Medium	High
		1009	Bothell - UW - Kenmore	372	14.8	Low	Low	Low	Medium	Medium	Medium	Medium
		1012	Ballard - Children's Hospital - Wallingford	44	5.9	High	High	Medium	Medium	Low	Medium	Low
		1059	Madison Valley - Seattle CBD - E Madison St	11, 12	2.4	Medium	High	High	Medium	High	Low	Low
		1063	U. District - Rainier Beach - Mount Baker	7s, 48	10.7	Medium	Medium	Medium	High	High	Low	Medium
		1993	Northgate - Seattle SBD - Ballard	40	13.7	Low	Medium	High	Low	Medium	High	High
	Suburban	1027	Totem Lake - Eastgate - Kirkland	234, 235, 271	14.6	Medium	Medium	High	Low	Low	Medium	High
		1028	Crossroads - Bellevue - NE 8th St	B South	3.3	High	High	High	Medium	Medium	Low	Low
		1030	Overlake - Renton - Eastgate	240, 245	17.7	Medium	Medium	Medium	Medium	Medium	High	Medium
		1033	Renton - Auburn - Kent	169, 180	16.5	Medium	Medium	Medium	Medium	Medium	Medium	High
		1041	SODO - Burien - Delridge	120	11.7	High	High	High	High	High	Medium	Medium
		1048	Renton - Burien - Tukwila	F	11.3	Medium	Medium	High	High	High	Medium	High
By 2040 Candidate RapidRide Lines	Urban	1002	Richmond Beach - UW - 15th Ave NE	73, 373, 348	12.1	Low	Low	Low	Medium	Medium	Low	Medium
		1007	Shoreline CC - UW - Lake City	75	11.6	Medium	Low	Low	High	Medium	Medium	Low
		1010	Fremont - Lake City - Ballard	D, 41	8.1	High	Low	Low	Low	Low	High	Medium
		1013	Northgate - Mount Baker - U. District	67, 70	7.1	Medium	High	High	Medium	Medium	Medium	High
		1014	Loyal Heights - U. District - Green Lake	45	6.5	High	Medium	Medium	Medium	Low	Medium	Medium
		1061	Uptown - Madison Park - Capitol Hill	8, 11	7.6	Medium	Medium	Medium	Low	Low	Low	Low
		1064	U. District - Othello - Capitol Hill	36, 49	10.1	Medium	High	Medium	High	High	Medium	Medium
		1202	Seattle CBD - Sand Point - Green Lake	62	11.3	Low	Medium	High	Medium	Medium	Medium	High
	Suburban	1025	Kenmore - Overlake - Totem Lake	234, 235	15.7	Low	Medium	Medium	Low	Low	Medium	Medium
		1026	Campton - Kirkland - Redmond	248	7.4	Low	High	Medium	Low	Low	Low	Medium
		1031	Issaquah Highlands - Eastgate - West Lake Sammamish Pkwy	271	11.7	Medium	Low	Medium	Low	Low	Medium	Medium
		1037	Kirkland - Eastgate - Overlake	221, 245	10.8	Low	Medium	High	Low	Medium	Medium	Medium
		1042	Alki - Tukwila - White Center	125	16.1	Medium	Medium	Low	Medium	Medium	Medium	Medium
		1043	Alki - Burien - West Seattle	128, 131	11.6	Medium	High	Low	Medium	Low	Low	Low
		1047	Rainier Beach - Federal Way - SeaTac	A, 124	16.1	High	High	Medium	High	High	High	High
		1049	Kent - Rainier Beach - Tukwila	150	12.9	High	Low	Medium	High	High	Medium	Medium
		1075	Renton Highlands - Rainier Beach - Renton	105, 106	11.1	High	High	Medium	High	High	Medium	Low
		1083	Beacon Hill - Burien - Georgetown	60, 132	9.5	Medium	Low	Medium	Medium	High	Medium	Low
		1215	Kenmore - Shoreline CC - North City	331	8.9	Low	Low	Low	Medium	Low	Medium	Low
		1513	NE Tacoma - Federal Way - Twin Lakes	903	7.8	Low	Medium	Medium	Medium	Medium	Low	Low
1514	Covington - SeaTac - Kent	180, 168	16.5	Medium	Low	Medium	Medium	Medium	Medium	Medium		
1515	Kent - Twin Lakes - Star Lakes	183, 901	11.7	Low	Medium	Low	Medium	Medium	Low	Medium		
1999	Redmond - Eastgate - Overlake	B, 245	10.6	High	Medium	High	Low	Medium	Medium	Medium		

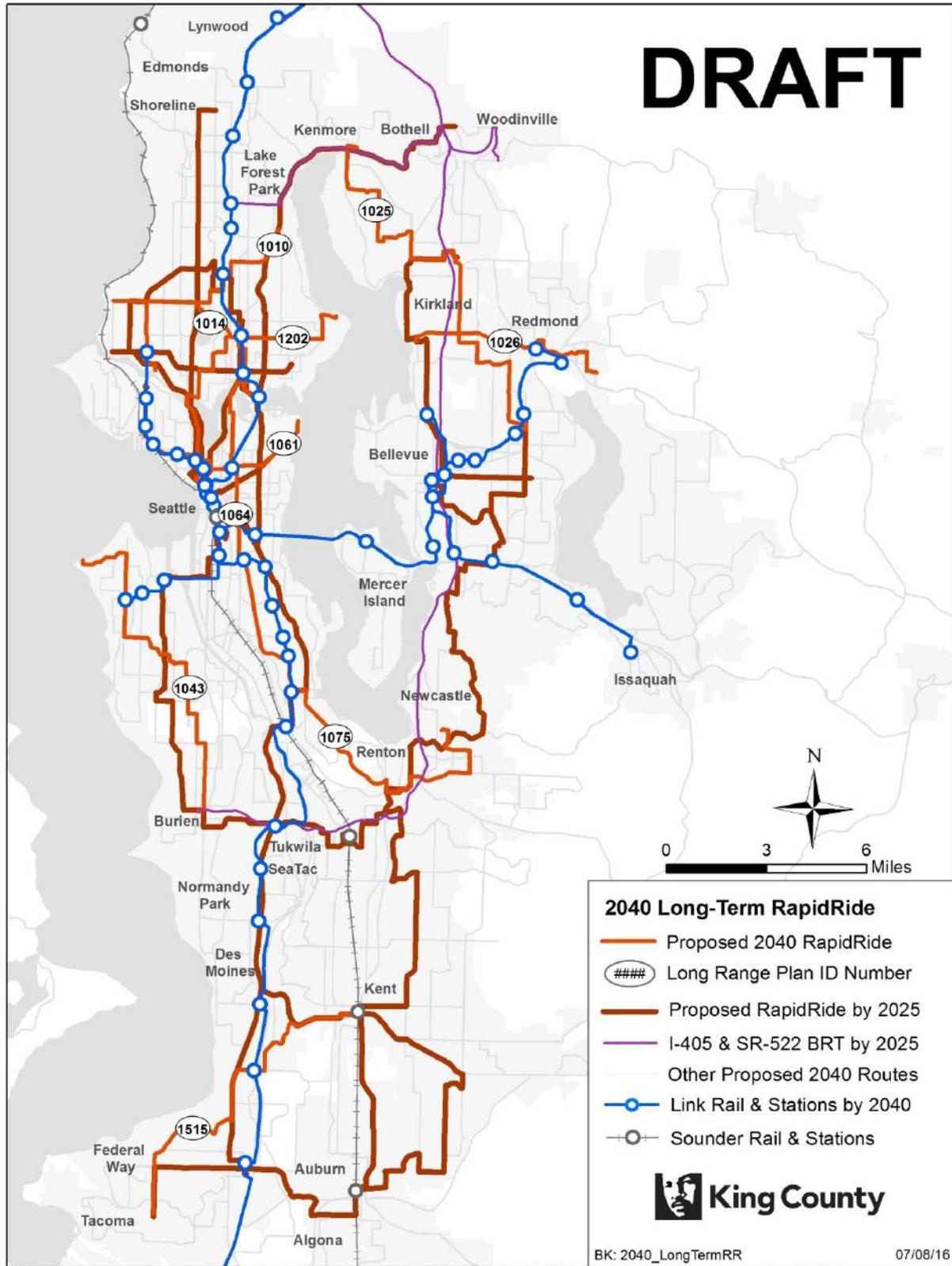
Candidate RapidRide lines for long-term investments – implementation between 2025 and 2040 – were drawn from the frequent service network in METRO CONNECTS. The lines selected for potential RapidRide service were determined using the evaluation criteria, including how well they connect to the proposed 2040 high capacity transit network and urban/manufacturing/activity centers, filling gaps within the existing, planned, and proposed high capacity transit network, and building strong connections to the regional and countywide transit network. In total, 36 candidate RapidRide lines were evaluated in the long-term 2040 candidate RapidRide analysis.

**Table G-5 Propsoed 2040 RapidRide Lines**

LRP Route ID	Comparable Route(s)	To / From / Via	Route Miles	Urban (U) or Suburban (S)
<b>1001 (E Line)</b>	E	Shoreline - Seattle CBD - SR-99	13	U
<b>1009</b>	372	Bothell - UW - Kenmore	15	U
<b>*1010 (D Line)</b>	D, 41	Fremont - Lake City - Ballard	8	U
<b>1012</b>	44	Ballard - Children's Hospital - Wallingford	6	U
<b>1013</b>	7n, 70, 67	Northgate - Mount Baker - U. District	11	U
<b>1014</b>	45	Loyal Heights - U. District - Green Lake	6	U
<b>1025</b>	234, 235	Kenmore - Overlake - Totem Lake	16	S
<b>1026</b>	248	Campton - Kirkland - Redmond	7	U
<b>1027</b>	234, 235, 271	Totem Lake - Eastgate - Kirkland	15	S
<b>*1028 (B Line)</b>	B South	Crossroads - Bellevue - NE 8th St	3	S
<b>1030</b>	240, 245	Overlake - Renton - Eastgate	18	S
<b>1033</b>	169, 180	Renton - Auburn - Kent	16	S
<b>1041</b>	120	SODO - Burien - Delridge	12	U
<b>*1043 (C Line)</b>	128, 131	Alki - Burien - West Seattle	12	S
<b>*1047 (A Line)</b>	A, 124	Rainier Beach - Federal Way - SeaTac	16	S
<b>1048 (F Line)</b>	F	Renton - Burien - Tukwila	11	S
<b>1052</b>	181	Twin Lakes - Green River CC - Federal Way	14	S
<b>1056</b>	164, 166	Highline CC - Green River CC - Kent	12	S
<b>1059</b>	11, 12	Madison Valley - Seattle CBD - E Madison St	2	U
<b>1061</b>	8, 11	Uptown - Madison Park - Capitol Hill	8	S
<b>1063</b>	7s, 48	U. District - Rainier Beach - Mount Baker	11	U
<b>1064</b>	36, 49	U. District - Othello - Capitol Hill	10	U
<b>1075</b>	105, 106	Renton Highlands - Rainier Beach - Renton	11	S
<b>1202</b>	62	Seattle CBD - Sand Point - Green Lake	11	U
<b>1515</b>	183, 901	Kent - Twin Lakes - Star Lakes	12	S
<b>1993</b>	40	Northgate - Seattle SBD - Ballard	14	U

\*Includes changes to a current or 2025 RapidRide Lines

Figure G-2 Map of Proposed 2040 RapidRide Network



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