



SECTION 2

SERVICE INVESTMENT PRIORITIES

This section identifies where investments are needed to provide high-quality service and to meet target service levels. When Metro has resources available to invest, or reallocates existing service hours, these findings and the priorities defined in the guidelines will be the basis for investments.

The investment needs identified in this analysis of spring 2014 data are shown in Table 6 below. The investment needs to reduce passenger crowding, improve schedule reliability, and meet target service levels are higher than those in the previous year's analysis

TABLE 6
2014 Investment Needs
 (Based on Spring 2014 Data)

Priority	Investment Area	Estimated Annual Hours Needed
1	Reduce passenger crowding	22,200
2	Improve schedule reliability	38,650
3	Increase service to meet target service levels in All-Day and Peak Network*	486,500
Total investment need		547,350
4	Increase service on high-productivity routes	See discussion on page 2

* Referred to in the service guidelines as "corridors below target service levels"

Annual service hours needed to reduce passenger crowding increased from 15,400 to 22,200; hours needed to improve schedule reliability increased from 27,800 to 38,650; and hours needed to meet target service levels in the All Day and Peak Network increased from 467,500 to 486,500. The investment needs changed for several reasons:

- **Passenger crowding.** Growth in ridership resulted in more passenger crowding.
- **Schedule reliability declined** as a result of more crowded buses, more roadway construction, and traffic congestion that has worsened as the economy has improved.
- **Target service levels** changed for many corridors on the All-Day and Peak Network as a result of changes in ridership demand, land use, and distribution of low-income and minority riders. In addition, Metro made a significant investment in service on the corridor between Aurora Village and the Seattle central business district by starting the RapidRide E Line. This investment met the need identified on that corridor in last year's report. The RapidRide F Line began service in summer 2014 but is not reflected in this year's analysis because it was launched after the spring service change period.

Priority 1 – Passenger crowding investments

Investment in the most-crowded routes is the highest priority in the service guidelines. When service is chronically very crowded, it is poor quality and has a negative impact on riders and reduces overall ridership. Overcrowding is defined as a trip that on average has 25 to 50 percent more riders than seats (depending on service frequency) or has people standing for longer than 20 minutes. The passenger load thresholds are set so that we accept standing passengers on many of our services, but take action where crowding is at an unacceptable level on a regular basis. To ensure that investments are warranted to address problems, we consider performance over a longer period than a single service change.

The table below and Figure 4 identify routes that need additional trips to reduce crowding.

TABLE 7

Routes Needing Investment to Reduce Passenger Crowding

Shading indicates route is new to list of routes needing investment to reduce crowding

Route	Description	Day	Estimated Annual Hours Needed
C Line	Westwood Village - Alaska Junction - Seattle CBD	Weekday	1,400
D Line	Ballard - Seattle Center - Seattle CBD	Weekday	1,600
E Line	Aurora Village - Seattle CBD	Weekday	1,600
5	Shoreline CC - Seattle CBD	Weekday	1,300
8	Seattle Center - Capitol Hill - Rainier Beach	Weekday	600
15EX	Blue Ridge - Ballard - Seattle CBD	Weekday	1,100
16	Northgate TC - Wallingford - Seattle CBD	Weekday	1,600
18EX	North Beach - Ballard - Seattle CBD	Weekday	500
28	Whittier Heights - Ballard - Seattle CBD via Leary Av NW	Weekday	400
40	Northgate TC - Ballard - Seattle CBD via Leary Av NW	Weekday	700
41	Lake City - Seattle CBD via Northgate	Weekday	900
44	Ballard - Wallingford - Montlake	Weekday	300
48	Mount Baker - University District - Loyal Heights	Weekday	500
70	University District - Seattle CBD	Weekday	300
71	Wedgwood - University District - Seattle CBD	Weekday	400
72	Lake City - University District - Seattle CBD	Sunday	100
74EX	Sand Point - Seattle CBD	Weekday	500
101	Renton TC - Seattle CBD	Weekday	1,100
143EX	Black Diamond - Renton TC - Seattle CBD	Weekday	1,600
179	Twin Lakes - Seattle CBD	Weekday	600
214	Issaquah - Seattle CBD	Weekday	500
216	Sammamish - Seattle CBD	Weekday	700
218	Issaquah Highlands - Seattle CBD	Weekday	500
219	Redmond - Sammamish - Seattle CBD	Weekday	500
240	Bellevue - Newcastle - Renton	Weekday	1,700
268	Redmond - Seattle CBD	Weekday	600
372EX	Woodinville - Lake City - University District	Weekday	600
Total hours needed			22,200

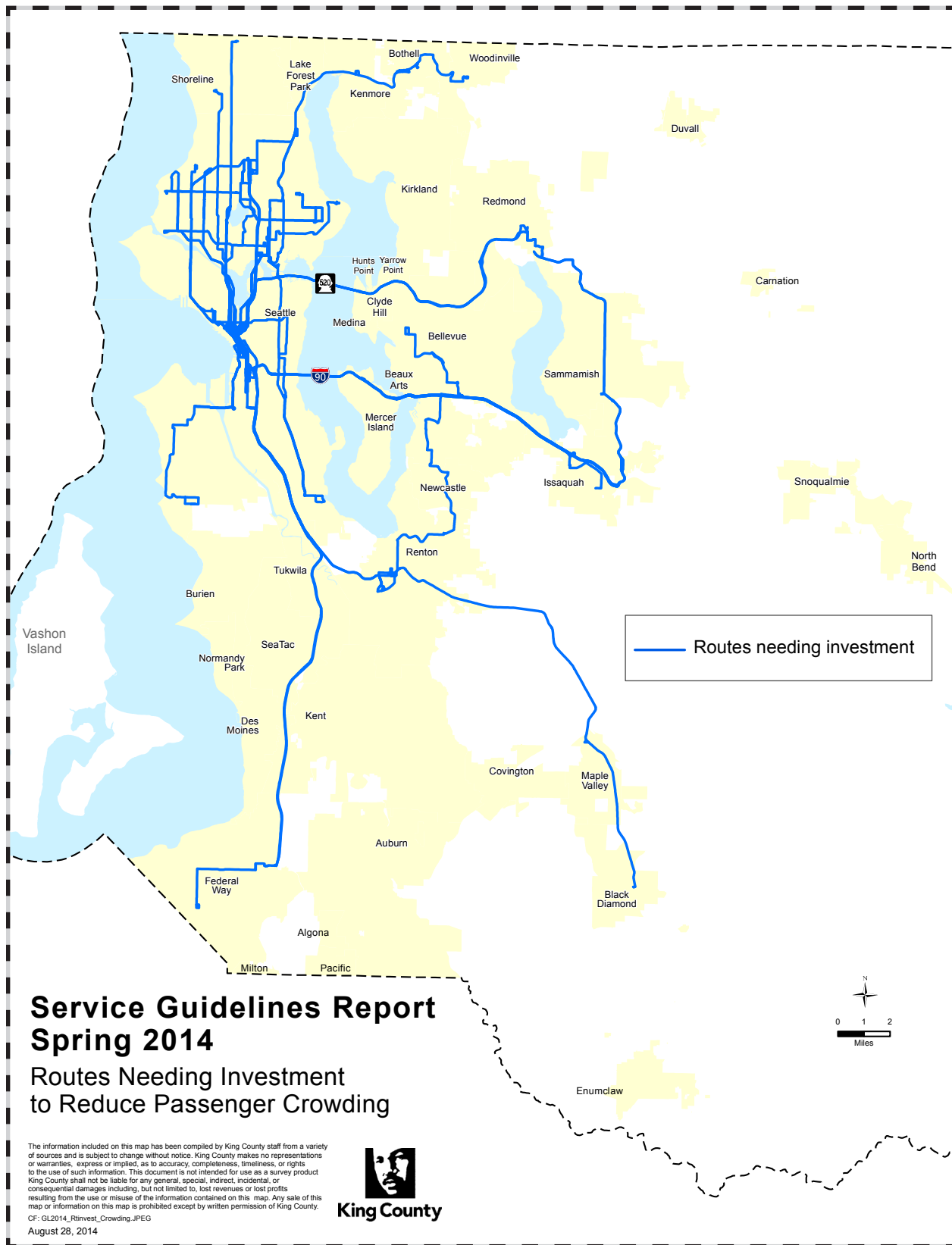
Metro did not have resources to make investments in routes identified as overcrowded in 2013. Ten routes identified in last year's report continue to need investment, and the need has grown significantly on routes 15 Express, 101, 240, and the D Line. This year, several routes operating between East King County and downtown Seattle were identified as needing investment that were not identified in last year's report, specifically peak-period I-90 services such as routes 214, 216, 218, and 219.

Some additional routes were identified as overcrowded but were determined to not need immediate investment either because surrounding trips had capacity or because passenger crowding could be accommodated by assigning a larger bus. Routes 67, 68, 131 and 166 had crowded trips that could be mitigated by assigning a larger bus. Routes 11, 17 Express, 31, 32, 66 Express, 72, 73, 76, 120, 123, 131, 212, 252, 255, 257, 271, 301 and 311 had crowded trips, but trips on nearby routes had capacity available. These routes will continue to be monitored for possible future investments.

In 2014, Metro transmitted to the King County Council a report on alternative passenger crowding measures. This report described possible new ways to measure crowding in future reporting, and analyzed potential impacts to service needs from using different measures. This report discussed the use of performance measures based on the floor area of a bus rather than the number of seats on the bus. See Section 5 for more information about this process.

FIG. 4

Routes Needing Investment to Reduce Passenger Crowding



Priority 2 – Improve schedule reliability

Schedule reliability is measured as the percentage of trips that arrive between 1 minute early and 5 minutes late. Routes that are on time less than 80 percent of the time (65 percent for weekday PM peak) are candidates for investment of service hours. This threshold allows for variations in travel time, congestion, and ridership. In our 2014 report, we used reliability data from June 2013 – May 2014. We use a longer time period for this analysis when possible to ensure that schedule reliability needs are not understated by using data from just the four-month spring period.

The table below lists the 89 routes identified as needing service-hour investments to improve their reliability based on data from June 2013 to May 2014; Figure 8 is a map of those routes. Total need increased from 27,800 hours in 2013 to 38,650 annual hours in 2014. This year more routes experienced reliability problems on weekends. Several routes with larger identified needs in 2014 were affected by construction projects; for example, the Mercer Street project in South Lake Union was a likely cause of increased need for hours on routes 8, 40 and 70.

The total need was calculated based on how far above the lateness threshold the routes were during the different time period. While this calculation provides a reasonable estimate of total needs, individual routes may receive more or less investment than estimated depending on the scheduling techniques available to improve reliability.

TABLE 8
Routes Needing Investment to Improve Schedule Reliability
 Shading indicates route is new to list of routes needing investment to improve reliability

Route	Area	Day	Estimated Annual Hours Needed
C Line	Westwood Village - Alaska Junction - Seattle CBD	Saturday	50
D Line	Ballard - Seattle Center - Seattle CBD	Saturday	100
1	Kinnear - Seattle CBD	Weekday, Saturday, Sunday	400
2	West Queen Anne - Seattle CBD - Madrona Park	Weekday, Saturday	650
3	North Queen Anne - Seattle CBD - Madrona Park	Weekday	500
4	East Queen Anne - Seattle CBD - Judkins Park	Weekday, Saturday	600
5	Shoreline CC - Seattle CBD	Saturday	100
7	Rainier Beach - Seattle CBD	Saturday	50
8	Seattle Center - Capitol Hill - Rainier Beach	Weekday	2,200
10	Capitol Hill - Seattle CBD	Weekday	250
11	Madison Park - Seattle CBD	Weekday, Saturday, Sunday	1,000
14	Mount Baker - Seattle CBD	Weekday, Saturday, Sunday	950
16	Northgate TC - Wallingford - Seattle CBD	Saturday, Sunday	25
17EX	Sunset Hill - Ballard - Seattle CBD	Weekday	250
18EX	North Beach - Ballard - Seattle CBD	Weekday	250
21EX	Arbor Heights - Westwood Village - Seattle CBD	Weekday	250
21	Arbor Heights - Westwood Village - Seattle CBD	Saturday	100
24	Magnolia - Seattle CBD	Weekday, Saturday	1,000
25	Laurelhurst - University District - Seattle CBD	Weekday	400
26EX	East Green Lake - Wallingford - Seattle CBD	Weekday	250
26	East Green Lake - Wallingford - Seattle CBD	Weekday, Saturday, Sunday	800
27	Colman Park - Leschi Park - Seattle CBD	Weekday, Saturday, Sunday	550

Route	Area	Day	Estimated Annual Hours Needed
28	Whittier Heights - Ballard - Seattle CBD via Leary Ave NW	Weekday, Saturday, Sunday	850
28EX	Broadview - Ballard - Seattle CBD via Leary Ave NW	Weekday	250
29	Ballard - Queen Anne - Seattle CBD	Weekday	400
31	University District - Fremont - Magnolia	Weekday, Saturday	350
32	University District - Fremont - Seattle Center	Saturday, Sunday	200
33	Discovery Park - Seattle CBD	Saturday	50
37	Alaska Junction - Alki - Seattle CBD	Weekday	250
40	Northgate TC - Ballard - Seattle CBD via Leary Ave NW	Weekday, Saturday, Sunday	2,100
41	Lake City - Seattle CBD via Northgate	Weekday	300
43	University District - Capitol Hill - Seattle CBD	Saturday	100
44	Ballard - Wallingford - Montlake	Saturday	50
48	Mt Baker - University District - Loyal Heights	Weekday, Saturday, Sunday	1,200
49	University District - Capitol Hill - Seattle CBD	Sunday	50
55	Admiral District - Alaska Junction - Seattle CBD	Weekday	250
56	Alki – Seattle CBD	Weekday	300
57	Alaska Junction - Seattle CBD	Weekday	300
60	Westwood Village - Georgetown - Capitol Hill	Saturday	100
64EX	Lake City - First Hill	Weekday	250
66EX	Northgate TC - Eastlake - Seattle CBD	Weekday	500
70	University District - Seattle CBD	Weekday	1,300
71	Wedgwood - University District - Seattle CBD	Weekday, Saturday, Sunday	350
72	Lake City - University District - Seattle CBD	Weekday, Saturday, Sunday	350
74EX	Sand Point - Seattle CBD	Weekday	250
76	Wedgwood - Seattle CBD	Weekday	250
83	Seattle CBD - Ravenna	Saturday	50
99	International District - Waterfront	Saturday, Sunday	100
101	Renton TC - Seattle CBD	Weekday, Saturday, Sunday	500
102	Fairwood - Renton TC - Seattle CBD	Weekday	250
105	Renton Highlands - Renton TC	Weekday, Sunday	300
111	Lake Kathleen - Seattle CBD	Weekday	400
114	Renton Highlands - Seattle CBD	Weekday	250
119EX	Dockton - Seattle CBD via ferry	Weekday	250
124	Tukwila - Georgetown - Seattle CBD	Weekday, Saturday, Sunday	1,600
128	Southcenter - Westwood Village - Admiral District	Weekday	700
131	Burien TC - Highland Park - Seattle CBD	Weekday, Saturday, Sunday	2,300
132	Burien TC - South Park - Seattle CBD	Weekday, Saturday, Sunday	1,000
143EX	Black Diamond - Renton TC - Seattle CBD	Weekday	400
157	Lake Meridian - Seattle CBD	Weekday	250
158	Kent East Hill - Seattle CBD	Weekday	250
159	Timberlane - Seattle CBD	Weekday	250
166	Kent Station - Burien TC	Weekday	300
167	Renton – Newport Hills – University District	Weekday	250
168	Maple Valley - Kent Station	Sunday	50

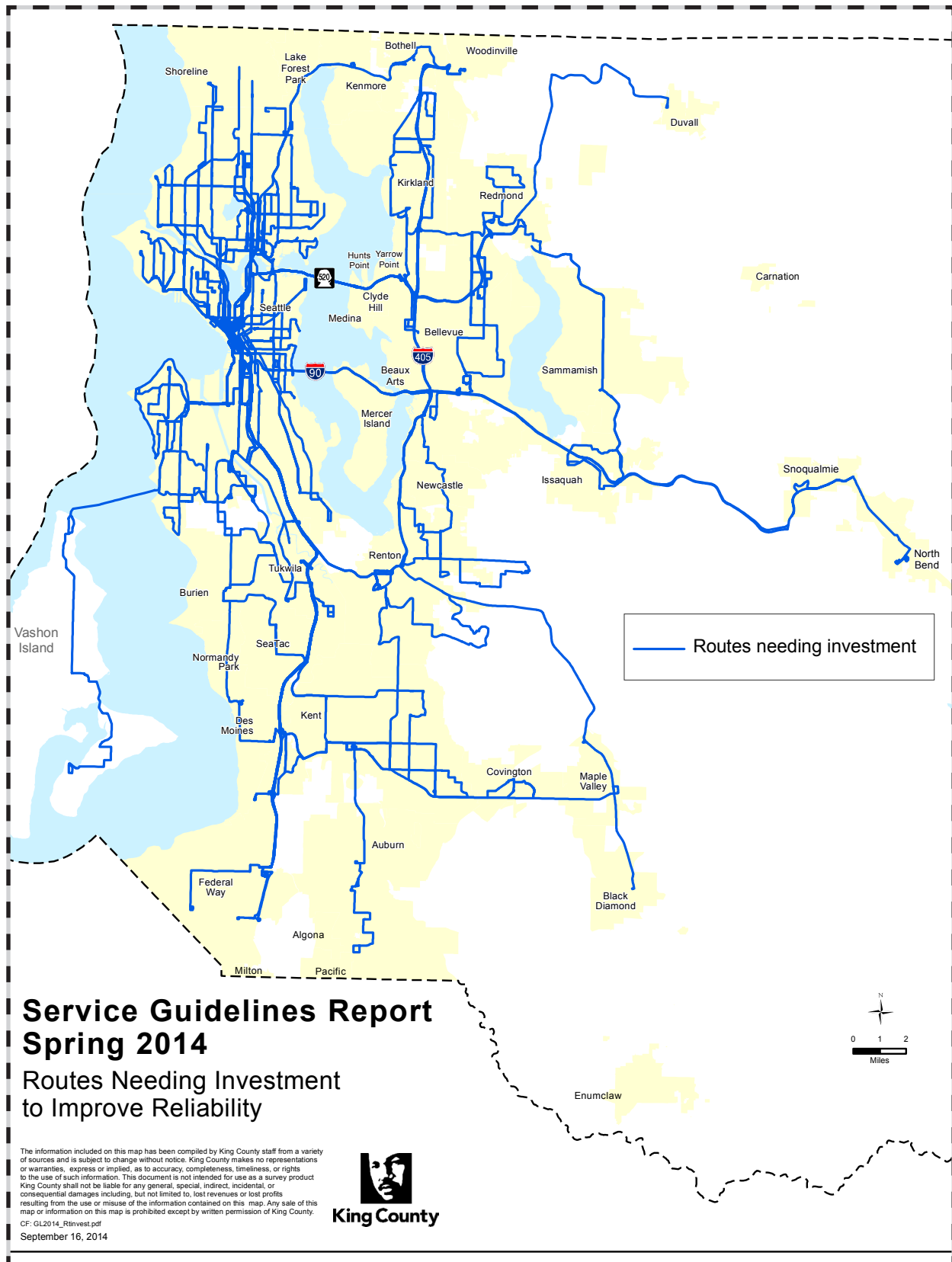
Route	Area	Day	Estimated Annual Hours Needed
169	Kent Station - East Hill - Renton TC	Weekday	800
177	Federal Way - Seattle CBD	Weekday	300
178	South Federal Way - Seattle CBD	Weekday	1,000
179	Twin Lakes - Seattle CBD	Weekday	600
180	Auburn - SeaTac Airport - Burien TC	Weekday	250
190	Redondo Heights - Seattle CBD	Weekday	250
192	Star Lake - Seattle CBD	Weekday	250
193EX	Federal Way - First Hill	Weekday	250
208	North Bend - Snoqualmie - Issaquah	Weekday, Saturday	300
219	Redmond - Sammamish - Seattle CBD	Weekday	250
221	Education Hill - Overlake - Eastgate	Sunday	50
232	Duvall - Bellevue	Weekday	250
237	Woodinville - Bellevue	Weekday	250
242	North City - Overlake	Weekday	250
245	Kirkland - Overlake - Factoria	Saturday, Sunday	200
255	Brickyard - Kirkland TC - Seattle CBD	Saturday	50
257	Brickyard - Seattle CBD	Weekday	250
269	Issaquah - Overlake	Weekday	300
277	Juanita - University District	Weekday	250
309EX	Kenmore - First Hill	Weekday	250
311	Duvall - Woodinville - Seattle CBD	Weekday	500
316	Meridian Park - Seattle CBD	Weekday	250
355EX	Shoreline CC - University District - Seattle CBD	Weekday	300
372EX	Woodinville - Lake City - University District	Weekday	250
601EX	Seattle CBD - Group Health (Tukwila)	Weekday	250
		Total hours needed	38,650

Some other routes had reliability problems but were determined not to need immediate investment because they were deleted in fall 2014 or have had major changes since spring 2014.

Reliability for all routes as measured during the period analyzed for this report is in Appendix D.

FIG. 5

Routes Needing Investment to Improve Schedule Reliability



Priority 3 – Corridors below target service levels

Our analysis found that 58 corridors in the All-Day and Peak Network were below target service levels in one or more time periods in spring 2014. Eleven corridors are new to this list in 2014 and 16 corridors from the 2013 list no longer have identified need in at least one time period. To bring service up to the target levels, an estimated 486,500 annual hours of investment would be needed—higher than the 2013 need of 467,500 annual hours and substantially higher than the 2012 need of 309,800 annual hours.

Table 9 lists the corridors that were below target service levels as of spring 2014; they are shown in Figure 6. Priority among these corridors was established according to the service guidelines by ordering the corridors in descending order of points, first by the geographic value score, then by the productivity score, and finally by the social equity score. This priority order helps ensure that service enhancements are distributed and productive throughout Metro’s service area.

TABLE 9
2014 Corridors Below Target Service Levels and Estimated Hours to Meet Service Level Targets, Ordered by Investment Priority
 Shading indicates corridor is new to list of corridors below target service level

Corridor number	Between	And	Major route	Estimated hours to meet target
105	U. District	Seattle CBD	49	4,700
10	Ballard	Seattle CBD	D Line	9,100
12	Ballard	Seattle CBD	40	4,400
25	Cowen Park	Seattle CBD	71/72/73/74EX	4,800
68	Northgate	U. District	66EX/67	6,100
69	Northgate	Seattle CBD	16	25,900
99	Tukwila	Seattle CBD	124	11,900
9	Ballard	Northgate	40	4,400
19	Burien	Seattle CBD	132	15,300
20	Capitol Hill	White Center	60	19,300
84	Renton	Seattle CBD	101/102	7,500
51	Kent	Seattle CBD	150	7,700
81	Redmond	Totem Lake	930	11,000
33	Federal Way	Kent	183	12,500
50	Kent	Renton	169	12,800
52	Kent	Renton	153	13,000
83	Renton	Burien	140	18,000
3	Auburn	Burien	180	21,900
100	Tukwila	Des Moines	156	5,000
59	Madison Park	Seattle CBD	11	7,800
38	Greenwood	Seattle CBD	5	2,700
61	Magnolia	Seattle CBD	24	4,600
8	Ballard	U. District	48	5,000
111	West Seattle	Seattle CBD	C Line	6,200
18	Burien	Seattle CBD	131	13,000
79	Rainier Beach	Capitol Hill	9EX	17,900
86	Renton	Seattle CBD	106	16,900

Corridor number	Between	And	Major route	Estimated hours to meet target
94	Shoreline CC	Northgate	345	4,400
16	Bellevue	Renton	240	10,600
87	Renton	Renton Highlands	105	2,700
112	White Center	Seattle CBD	125	3,700
95	Shoreline CC	Lake City	330	3,200
7	Avondale	Kirkland	248	4,200
37	Green River CC	Kent	164	5,700
48	Kent	Burien	166	5,300
1	Admiral District	Southcenter	128	21,000
31	Fairwood	Renton	148	1,200
41	Issaquah	Overlake	269	11,300
44	Kenmore	Shoreline	331	5,000
46	Kenmore	Totem Lake	935 DART	2,800
49	Kent	Maple Valley	168	7,600
82	Redmond	Fall City	224	5,200
101	Tukwila	Fairwood	906 DART	6,000
30	Enumclaw	Auburn	186/915 DART	2,600
24	Colman Park	Seattle CBD	27	9,000
64	Mount Baker	Seattle CBD	14	8,200
107	U. District	Seattle CBD	25	8,600
26	Discovery Park	Seattle CBD	33	5,000
72	Eastgate	Bellevue	226	6,500
92	Sand Point	U. District	30	3,400
70	Northgate	U. District	68	8,100
58	Laurelhurst	U. District	25	3,400
28	Eastgate	Bellevue	246	6,200
93	Shoreline	U. District	373EX	24,900
47	Kennydale	Renton	909 DART	3,000
89	Renton Highlands	Renton	908 DART	3,000
102	Twin Lakes	Federal Way	903 DART	2,300
74	Pacific	Auburn	917 DART	3,000
			Total	486,500

Change from 2013

The list of corridors below target service levels identified in spring 2014 differs from the spring 2013 list because of service investments and changes in corridor scores since the last report. Corridor scores reflect changes in the underlying land use, social equity, and performance data. Table 10 lists the corridors that were below target service levels in 2013 but are no longer targeted for investment in at least one time period. Some of these corridors still have identified needs but have fewer time periods with needs this year. Reasons for change include:

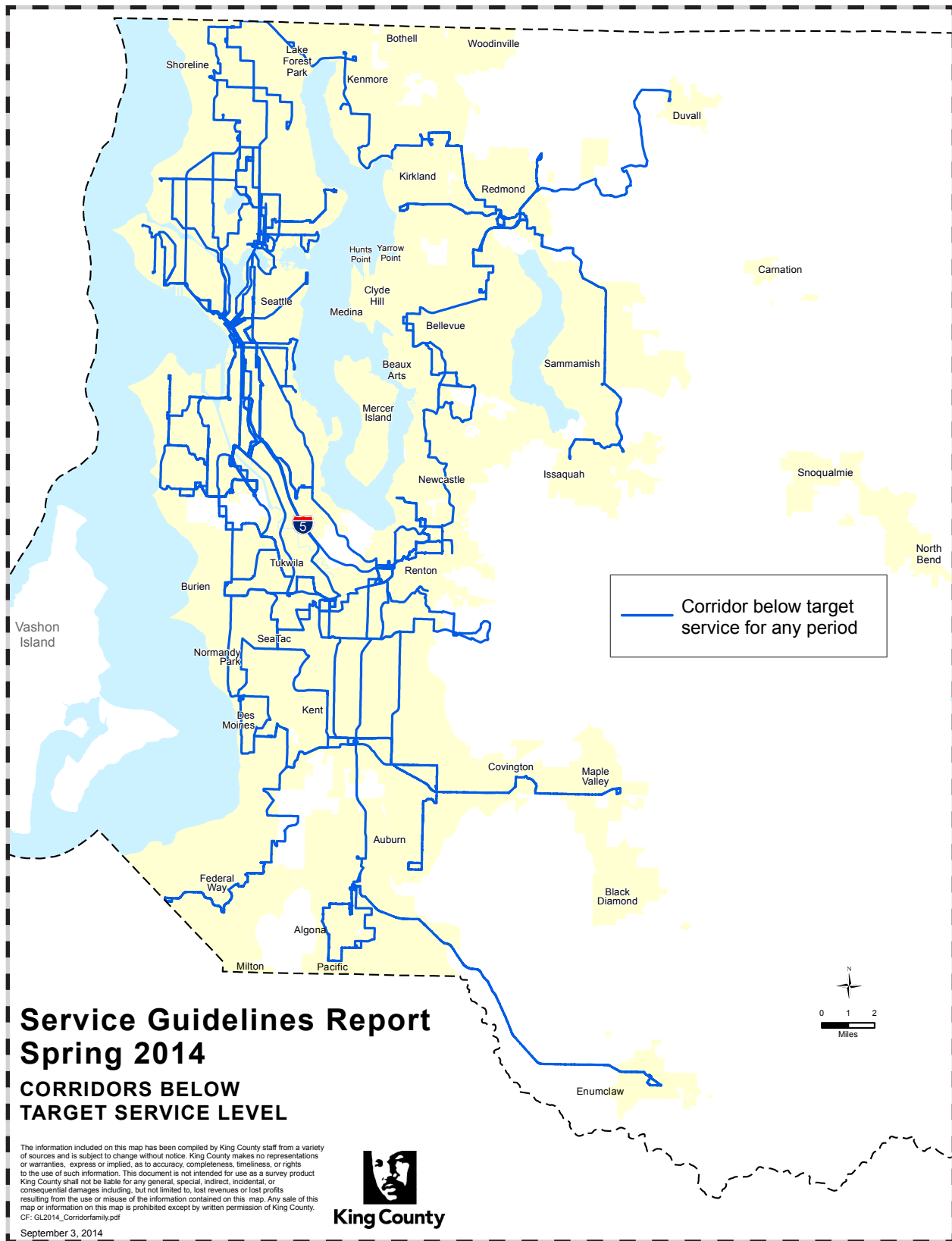
- Service improvements made in 2014. Service was improved when the RapidRide E Line began.
- Changes in ridership and productivity. The ridership and productivity of major routes changed on several corridors. While some corridors increased their target service levels, other corridors were targeted for less service because they needed less to meet existing demand.

In general, we expect to see changes each year in corridors that are below target service levels as ridership, productivity, and social conditions evolve. Our analysis takes such changes into account as we determine what investments may be needed.

TABLE 10
2013 Corridors Below Target Service Levels that are No Longer Targeted for Investment

Corridor Number	Between	And	Major route	Reason for Change
2	Alki	SODO	50	Lower peak loads
5	Aurora Village	Seattle CBD	E Line	Start of RapidRide E Line (service improvement)
27	Eastgate	Bellevue	241	Lower proportion of riders from low-income census tracts
32	Federal Way	SeaTac	A Line	Lower off-peak loads
35	Fremont	U. District	31/32	Lower peak and off-peak loads
37	Green River CC	Kent	164	Off-peak service no longer targeted because of lower off-peak loads; peak and night service remain targeted
45	Kenmore	U. District	372EX	Lower off-peak loads; lower proportion of riders from low-income census tracts
55	Lake City	Seattle CBD	41	Corrections to current frequency calculation; lower off-peak loads and night cost recovery
56	Northgate	U. District	75	Lower proportion of riders from low-income census tracts
57	Lake City	U. District	65	Corrections to current frequency calculation
65	Mountlake Terrace	Northgate	347	Lower cost recovery at night
70	Northgate	U. District	68	Corrections to current frequency calculation; off-peak and night service remain targeted
71	Othello Station	SODO	50	Lower peak loads
94	Shoreline CC	Northgate	345	Off-peak service no longer targeted due to lower proportion of riders from low-income tracts; peak and night service remain targeted
100	Tukwila	Des Moines	156	Night service no longer targeted because 2013 guidelines report erroneously showed no night service; peak service remains targeted
112	White Center	Seattle CBD	125	Night service no longer targeted as result of more accurate current frequency calculation and lower cost recovery; peak service remains targeted

FIG. 6
 2014 Corridors Below Target Service Levels



Priority 4 – High-productivity routes

Route productivity is assessed using two measures: rides per platform hour or passenger miles per platform mile (see Section 1). High-productivity routes are defined as those that perform in the top 25 percent of comparable routes on one or both measures in at least one time period. In the spring 2014 period, of the 214 routes evaluated, 81 were in the top 25 percent in at least one time period on one or both productivity measures.

Metro must become more productive and carry more riders to help fulfill the public transportation expectation set in *Transportation 2040*—this is one reason why the guidelines define highly productive services as an investment priority. Investing in high-productivity routes in areas where there is latent demand for transit will result in higher ridership. A substantial portion of the growth needed to meet the *Transportation 2040* expectation (an additional 2.6 million annual service hours) will be on high-productivity services.

Metro has demonstrated that investments in highly productive service lead to increased ridership. We will continue to invest in high-productivity services when we restructure service, form service partnerships with local jurisdictions, or have other opportunities.

Many services that performed highly in 2013 continued to do so in 2014. Some notable groups of high-productivity routes include:

- **RapidRide lines.** Investments to improve frequency and quality of service have resulted in ridership growth on all RapidRide corridors. The A, B, D, and E lines are among the top 25 percent of routes on both performance measures in all time periods. The C Line and Route 140 (now F Line) were among the top 25 percent of routes on one or both performance measures in all time periods.
- **Downtown Seattle to University District routes.** Routes 49, 71, 72, 73 and 74 Express continue to be top performers that connect the largest transit markets in King County.
- **Commuter routes serving north Seattle.** Routes 15 Express, 74 Express, 76, 77 and 316 are the top-performing commuter routes. These highly successful commuter routes operate in areas that have high demand for service, including Ballard, the University District, northeast Seattle, and Shoreline.
- **Routes connecting regional growth centers in south King County.** The network of routes that connect regional growth centers in south King County—128, 140 (future F Line), 164, 166, 169, 180, and 181—continued to perform well in 2014. Their good performance is indicative of the strong demand for transit between regional growth and activity centers in south King County.
- **Routes that connect neighborhoods to Northgate.** The network of all-day routes in north King County connects several routes with the high-performing Route 41, which connects Northgate to downtown Seattle. Routes 345, 346 and 347 provide neighborhood circulation as well as a connection to Northgate. This group of routes performs well on the neighborhood routes that both circulate and connect to the trunk service and the all-day service to downtown Seattle.
- **Peak routes serving Eastgate Park and Ride.** Several peak routes that provide service between Eastgate Park and Ride and downtown Seattle perform well on passenger miles per platform mile—including routes 212, 216, 217, 218 and 219. Goal performance on the passenger miles measure indicates that service is well-used and buses are full along most of these routes.

TABLE 11

2014 Routes in Top 25% on Both Measures in All Time Periods Served

Shading indicates route is new to list of routes in top 25% on both measures

Route	Description	Time Period
A Line	Federal Way - Tukwila	Peak, off peak, night
B Line	Bellevue - Crossroads - Redmond	Peak, off peak, night
D Line	Ballard - Seattle Center - Seattle CBD	Peak, off peak, night
E Line	Aurora Village - Seattle CBD	Peak, off peak, night
15EX	Blue Ridge - Ballard - Seattle CBD	Peak
41	Lake City - Seattle CBD via Northgate	Peak, off peak, night
49	University District - Capitol Hill - Seattle CBD	Peak, off peak, night
71	Wedgwood - University District - Seattle CBD	Peak, off peak, night
72	Lake City - University District - Seattle CBD	Peak, off peak, night
73	Jackson Park - University District - Seattle CBD	Peak, off peak, night
74EX	Sand Point - Seattle CBD	Peak
76	Wedgwood - Seattle CBD	Peak
77	North City - Seattle CBD	Peak
164	Green River CC - Kent Station	Peak, off peak, night
166	Kent Station - Burien TC	Peak, off peak, night
169	Kent Station - East Hill - Renton TC	Peak, off peak, night
316	Meridian Park - Seattle CBD	Peak