King County Metro Transit
2011 Service Guidelines Report

March 2012

King County METRO

We'll Get You There

Department of Transportation
Metro Transit Division
King Street Center, KSC-TR-0415
201 S. Jackson St
Seattle, WA 98104
206-553-3000 TTY Relay: 711
www.kingcounty.gov/metro

Alternative Formats Available

206-263-5277 TTY Relay: 711

12020/comm

SECTION 3

SERVICE QUALITY ANALYSIS

Passenger loads

Following the guidelines, we measured passenger loads by comparing the maximum number of riders on a bus during a trip with the number of seats on the bus. The ratio of riders to seats is called "load factor." A trip is defined as overloaded if the average of the maximum load factor is greater than 1.25 or 1.5, depending on service frequency; or if the average maximum load factor is greater than 1.0 for longer than 20 minutes. This measure is designed to identify trips that are significantly and continually overloaded.

For weekdays, we calculated average trip ridership for fall 2010 and spring 2011. For weekends, we averaged trip ridership for fall 2009, spring 2010, fall 2010, and spring 2011. We averaged trip ridership to make sure we used enough data from automatic passenger counters about a specific trip to get an accurate measurement of loads. Our analysis identified the routes listed in the table below as having one or more trips that exceeded the service guidelines' passenger-load threshold during the periods shown.

RESULTS

Based on our analysis, we estimate that about 7,700 annual service hours are needed to address existing overcrowding problems through addition of new trips. Other actions might be considered as well, such as assigning bigger buses to reduce crowding or changing the schedule to keep buses on time.

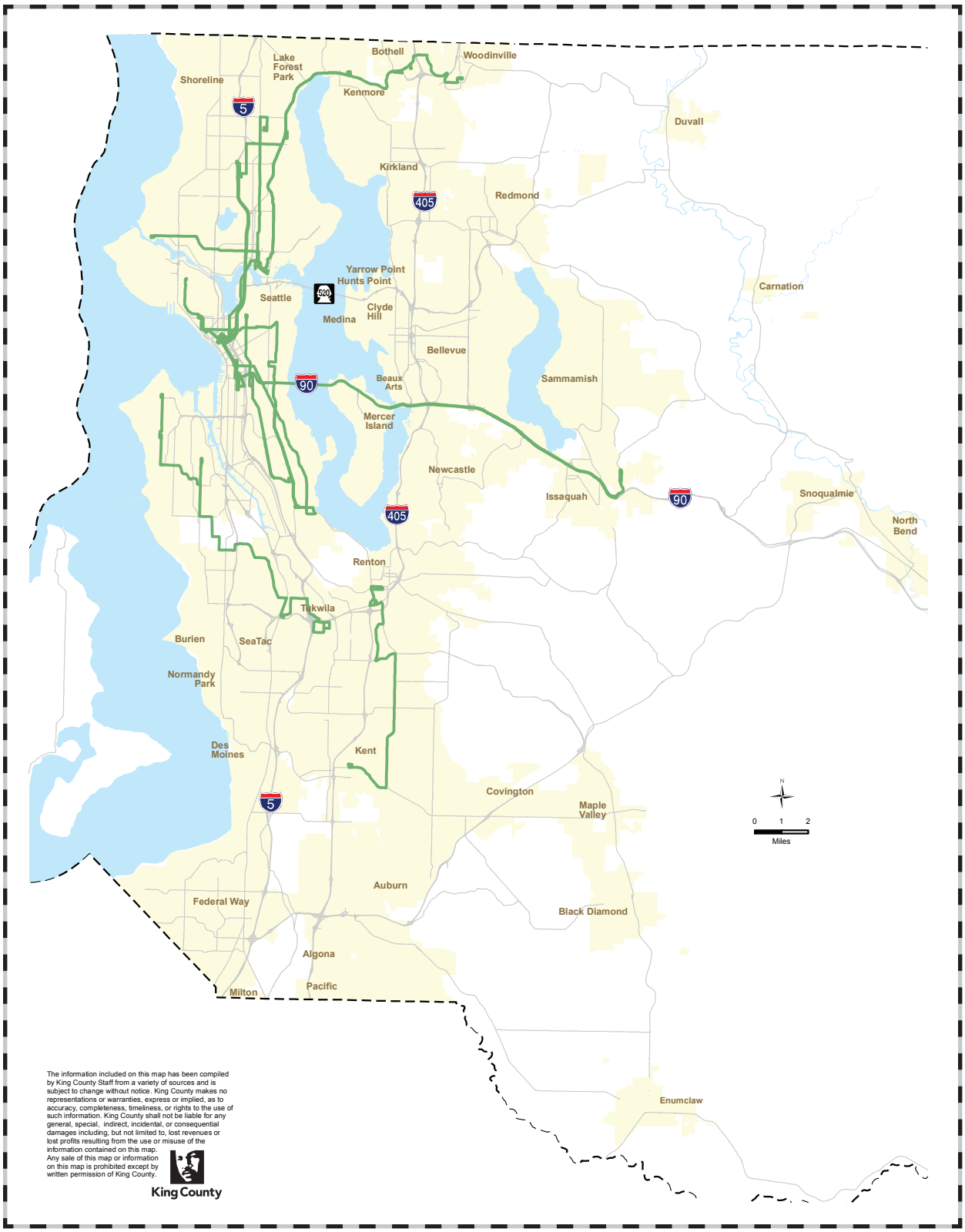
Routes Exceeding Passenger Load Threshold

Route	Between	And	Via	Day	Estimate cost (annual hours)
1	Kinnear	Downtown Seattle		Weekday	300
8	Rainier Beach	Queen Anne	Capitol Hill	Weekday	400
9	Rainier Beach	Capitol Hill		Weekday	400
36	Othello Station	Downtown Seattle	Beacon Hill	Sunday	300
41	Northgate	Downtown Seattle	I-5	Weekday	400
44	Ballard	University District	Wallingford	Weekday	1,300
73	Jackson Park	Downtown Seattle	University District	Sunday	1,900
128	Southcenter	Admiral District	Alaska Junction and White Center	Weekday	1,000
169	Renton	Kent	Kent East Hill	Weekday	400
218	Issaquah Highlands P&R	Downtown Seattle		Weekday	500
372	University District	Woodinville		Weekday	800
				Total	7,700

Source: Fall 2009-Spring 2011

FIG. 8

Routes with Overcrowding, Spring 2011



Schedule reliability

We measured reliability by identifying trips as on-time or late. A trip is considered late if it arrives at any time point along its route more than five minutes after the scheduled time. The service guidelines do not consider early trips when identifying schedule reliability problems; they address only late operation because those reliability problems are more likely to require investment to fix.

The guidelines suggest that we consider investing more service hours in routes to improve their reliability if they are late more than 20 percent of the time on an average weekday or weekend, or more than 35 percent of the time in the weekday PM peak period. The threshold is lower for the PM peak because of the high variability of travel times and heavy congestion during that period.

Our analysis identified the routes listed in the table below as failing the reliability guideline in at least one time period, based on travel-time data from September 2010 to August 2011. We estimate that about 32,500 annual service hours are needed to address reliability problems by adding travel time or changing schedules of these routes.

There are other ways to improve the percentage of trips that are on time, including giving buses priority through special traffic signals or dedicated lanes (e.g. HOV or BAT lanes).

Transit priority or road changes require planning and cooperation with the many cities that Metro serves. Seeking transit priority on roadways is a long-term strategy for improving reliability but does not avoid the need to invest in poor performing routes at present. Another way to improve reliability is to reduce the number of routes that are through-routed, where one route continues as a different route without any time or pause in between. While through-routing is efficient in saving hours and making use of limited road and bus-stop space, it can make service unreliable because any delays experienced on one route are carried over to the next route.

Routes Failing Reliability Threshold, September 2010-August 2011

(% of late trips is listed only for the time periods that a route is failing)

N/A = No service on this route during that time period

Route	Between	And	Via	Weekday % late	PM Peak % late	Saturday % late	Sunday % late
2	Queen Anne	Downtown Seattle	Queen Anne Ave N	-	-	20%	-
5	Greenwood	Downtown Seattle	Aurora Ave N, Phinney	-	-	32%	25%
7	Rainier Beach	Downtown Seattle	Rainier Ave	23%	-	-	-
8	Rainier Beach	Queen Anne	Capitol Hill	25%	43%	21%	22%
15	Blue Ridge	Downtown Seattle	Ballard	23%	39%	23%	-
16	Northgate	Downtown Seattle	Greenlake	33%	48%	34%	28%
17	Loyal Heights	Downtown Seattle	Ballard, South Lake Union	-	36%	25%	22%
18	North Beach	Downtown Seattle	Ballard, Uptown	22%	41%	22%	-
21EX	Arbor Heights	Downtown Seattle		-	38%	N/A	N/A
21	Arbor Heights	Downtown Seattle	35th Ave SW, Alaskan Wy Viaduct	24%	43%	21%	-
22	White Center	Downtown Seattle	Alaska Junction, SODO	31%	49%	22%	-
23	White Center	Downtown Seattle	Highland Park Wy	28%	-	30%	24%
24	Magnolia	Downtown Seattle	Viewmont Way–Elliott	-	-	30%	-
26	Wallingford	Downtown Seattle	Fremont	-	-	21%	-
27	Colman Park	Downtown Seattle	Yesler	22%	-	23%	-
28	Broadview	Downtown Seattle	Fremont	30%	36%	29%	31%
30	Sand Point	Queen Anne	University District	23%	38%	-	-

Route	Between	And	Via	Weekday % late	PM Peak % late	Saturday % late	Sunday % late
31	Magnolia	University District	Fremont	20%	-	22%	N/A
33	Magnolia	Downtown Seattle	Elliott Ave W	21%	-	-	-
37	Alaska Junction	Downtown Seattle	Alki, Beach Drive	35%	42%	N/A	N/A
38	Rainier Ave	Beacon Ave	S. McClellan	48%		24%	N/A
39	Rainier Beach	Downtown Seattle	Seward Park, Beacon Hill	28%	38%	26%	22%
43	University District	Downtown Seattle	Capitol Hill	-	-	21%	-
48	Loyal Heights	University District	Greenlake	-	-	28%	-
49	University District	Downtown Seattle	Capitol Hill, Broadway	22%	-	-	-
54EX	Fauntleroy	Downtown Seattle	Alaskan Way Viaduct	27%	36%	N/A	N/A
54	White Center	Downtown Seattle	Fauntleroy	22%	38%	28%	22%
55	Admiral District	Downtown Seattle	California Ave–Alaskan Way Viaduct	-	35%	26%	-
57	Alaska Junction	Downtown Seattle	Admiral Way	36%	58%	N/A	N/A
60	Broadway	White Center	Georgetown Beacon Hill	27%	-	23%	-
66EX	Northgate	Downtown Seattle	Roosevelt District, Eastlake	21%	-	-	-
68	Northgate	University District	Roosevelt	26%	-	27%	N/A
71	Wedgwood	University District	Latona	24%	N/A	-	-
72	Lake City	Downtown Seattle	Ravenna		N/A	20%	-
81	Downtown Seattle	Loyal Heights	Ballard	24%	N/A	29%	28%
105	Renton Highlands	Renton	Renton Technical College	24%	-	-	-
106	Renton	Downtown Seattle	S Beacon Hill, Georgetown	22%	-	-	-
113	Shorewood	Downtown Seattle	White Center, SR-509	-	41%	N/A	N/A
119EX	Vashon/Dockton	Downtown Seattle	SODO	21%	-	N/A	N/A
120	Burien	Downtown Seattle	White Center	-	-	21%	21%
121	Des Moines	Downtown Seattle	Burien	20%	-	N/A	N/A
122	Highline CC	Downtown Seattle	Normandy Park, Burien	21%	-	N/A	N/A
124	SeaTac	Downtown Seattle	Marginal Way S	-	-	22%	-
125	Shorewood	Downtown Seattle	SSCC	31%	46%	20%	21%
128	Southcenter	Admiral District	White Center	30%	42%	21%	-
131	Midway/ DesMoines	Downtown Seattle	Burien	23%	-	34%	-
132	Burien	Downtown Seattle	Burien	22%	-	33%	-
150	Kent	Downtown Seattle	I-5	-	-	-	21%
166	Des Moines	Kent	Highline Community College	24%	-	-	-
169	Renton	Kent	Canyon Dr, 104th/108th Ave SE	25%	-	-	-
181	Federal Way	Auburn	SW 320 St-Peasley Canyon Rd	22%	-	-	-
182	Federal Way	Twin Lakes	Federal Way Transit Center-Auburn Station	21%	-	-	-
187	Twin Lakes	Federal Way	S 320th St	23%	35%	-	-
205EX	Mercer Island	University District	First Hill	20%	-	N/A	N/A
209	North Bend	Issaquah	I-90	-	-	27%	N/A
222	Bellevue	Eastgate	Beaux Arts, Factoria	23%	-	-	-

Route	Between	And	Via	Weekday % late	PM Peak % late	Saturday % late	Sunday % late
224	Redmond	Fall City	Duvall, Stillwater, Carnation	57%	67%	N/A	N/A
233	Bellevue	Bear Creek	Overlake	32%	43%	-	N/A
240	Bellevue	Renton	Newcastle, Factoria, Eastgate	21%	-	23%	-
247	Kent, Renton	Overlake	Eastgate	22%	49%	N/A	N/A
251	Bothell	Redmond	Woodinville	27%	35%	-	N/A
255	Brickyard P&R	Downtown Seattle	Kirkland	-	-	23%	-
280	Bellevue	Seattle	Renton	-	N/A	27%	-
309EX	Kenmore	First Hill	Lake Forest Park, Lake City	35%	56%	N/A	N/A
311	Duvall	Downtown Seattle	I-5, SR-520, I-405	20%	-	N/A	N/A
330	Shoreline	Lake City	Fircrest	21%	-	N/A	N/A
358EX	Aurora Village Transit Center	Downtown Seattle	Greenlake	29%	41%	-	-
373EX	Aurora Village Transit Center	University District	Jackson Park	22%	35%	N/A	N/A

In 2010 and 2011, we improved the efficiency of schedules by reducing the amount of recovery time relative to time picking up passengers. While this effort has saved money and brought Metro's schedule efficiency closer to that of its peers, it has also caused reliability to drop, because when a bus is running late it has less time to recover before the next trip. Any investments to improve reliability will be made with a goal of maintaining efficient schedules, but the addition of time to schedules may affect schedule efficiency.

FIG. 9

Routes with Poor On-Time Performance, Spring 2011