

Standardizing the measurement of crowding

Metro is suggesting to standardize the way we determine whether trips are crowded across our diverse fleet. Metro would shift from a seats-based measure to an area-based measure. **Metro will continue to identify trips that have standing loads for greater than 20 minutes and target them for investment alongside crowded trips as part of investment priority 1.**

Previous method

Metro currently uses “load factors” to measure crowding on buses. A load factor is a ratio of the maximum passenger load a bus trip experiences to the number of seats on the bus:

$$\frac{\text{Maximum passenger load}}{\text{\# of seats on the bus}}$$

For example, a bus with 60 passengers and 40 seats has a load factor of 1.5; there are 1.5 times as many passengers as there are seats. The higher the load factor, the more people are on the bus.

Metro has two load factor thresholds that determine which trips are crowded: trips above the listed load factor are considered crowded. Currently, higher crowding levels are accepted on frequent service:

Trip characteristic	Load factor threshold
Trips operating at frequencies of 10 minutes or less (and all RapidRide lines)	1.5
All other trips	1.25

Why change?

The diversity of Metro’s fleet has been increasing; our newer buses have low floors, fewer seats, and more standing room. In response to RTC concerns that passenger crowding was not being measured equally across various types of buses, Metro studied the issue. We found that many other peer agencies use **area-based standards** to measure crowding.

Revised method

Metro is recommending moving to an area-based crowding standard. A space allowance of four square feet per passenger most closely mirrors the *average* of the current crowding thresholds (a fleet-wide average equivalent load factor of 1.37). For example, a bus with 80 square feet of space available for standing would accommodate 20 standing passengers (in addition to those in seats) before being considered crowded. To simplify and standardize measurements, Metro would no longer have different crowding thresholds based on the frequency of service.

Impact

The change to an area-based metric standardizes the measurement of crowding, ensuring that similar passenger experiences across a variety of bus types are treated equally. It also simplifies data processing, as a single set of thresholds is used (as opposed to the two mentioned above). Data processing is further simplified by establishing a clear rule in our methodology that if no excess capacity exists within 15 minutes of a trip identified as crowded, the route is identified as needing investment.

Based on spring 2015 data, we found a reduced investment need for crowding of approximately 8,000 annual service hours. It is important to note that this amount constitutes a mere 0.2% of Metro’s system size of 3.4 million hours. The table below shows changes in investment needs at the route level. **The numbers reflect remaining need after subtracting Seattle and Metro investments in June and September 2015 and March 2016, not including any effects of the forthcoming U-Link restructure.**

Priority 1 Investment Needs, Current Guidelines and Revised Guidelines

Route	2015 Service Guidelines Report	Revised Guidelines	Difference	Route	2015 Service Guidelines Report	Revised Guidelines	Difference
C Line	800		-800	71	400	500	100
D Line	1,100	1,200	100	72	700		-700
5EX	700		-700	75	400		-400
8	200		-200	76	900	400	-500
11	200		-200	77EX	200		-200
16	500		-500	101	400		-400
17EX	500	500	0	118EX	700		-700
21		300	300	119	400		-400
27	500		-500	128		500	500
28	100	100	0	214	100	250	150
32	100		-100	219	600		-600
33	800	400	-400	238		300	300
40	2,000		-2,000	248		300	300
50		500	500	255	1,200		-1,200
65	500		-500	316	400		-400
67		300	300	372		700	700
				Total	14,400	6,250	-8,150
				Total system size (spring 2015): 3,406,000			

The table below shows the new, area-based passenger load thresholds compared to the load factor thresholds for each bus type.

Bus Type	Number of passengers required to be considered crowded		
	REVISED GUIDELINES	CURRENT GUIDELINES	
	Area-based Passenger Load Threshold	Load Factor 1.25 (worse than 10 minute frequency)	Load Factor 1.5 (10 minute frequency or better and all RapidRide)
30’ Gillig high-floor diesel	37	37.5	45
35’ New Flyer hybrid	37	33.75	40.5
40’ Gillig high-floor diesel	56	52.5	63
40’ Gillig high-floor trolley	56	52.5	63
40’ New Flyer low-floor diesel	49	43.75	52.5
40’ Orion low-floor hybrid	51	43.75	52.5
60’ New Flyer high-floor diesel	84	80	96
60’ Breda high-floor trolley	77	70	84
60’ New Flyer low-floor hybrid	79	72.5	87
60’ New Flyer low-floor hybrid	77	70	84
60’ low-floor RapidRide	74	60	72

Valuing centers

The task force recommended adjustments to the geographic value portion of setting **target service levels**. The changes would value all connections to centers.

Each year, Metro makes a determination of how much service is warranted on its 112 corridors. As part of making this determination, Metro measures geographic value. Corridors can score a maximum of 10 points for geographic value. These points, along with points for productivity and social equity, determine each corridor’s **target service level**.

In the current service guidelines, points are awarded as follows:

Primary connection between regional growth, manufacturing/industrial centers	Yes	5
	No	0
Primary connection between transit activity centers	Yes	5
	No	0

For the first category, PSRC centers are also counted as transit activity centers, so a primary connection between PSRC centers scores 10 points in practice. Determining which corridor constitutes the “primary connection” for each center-to-center connection is accomplished using a combination of travel times and the frequency of trips.

The recommended changes expand the types of connections that are valued in the scoring system. Metro would significantly expand the number of center-to-center connections we analyze and award points as follows:

Primary connection between regional growth, manufacturing/industrial centers	Yes	10
Primary connections between transit activity center and regional growth, manufacturing/industrial centers	Yes	7
Primary connection between transit activity centers	Yes	5
Other connection to any center	Yes	2

Impact

A total of 72 corridors increased their geographic value score. No corridors lost points. All corridors connect to at least one center, and thus all corridors score at least 2 points.

Service guidelines: timing of data collection and reporting

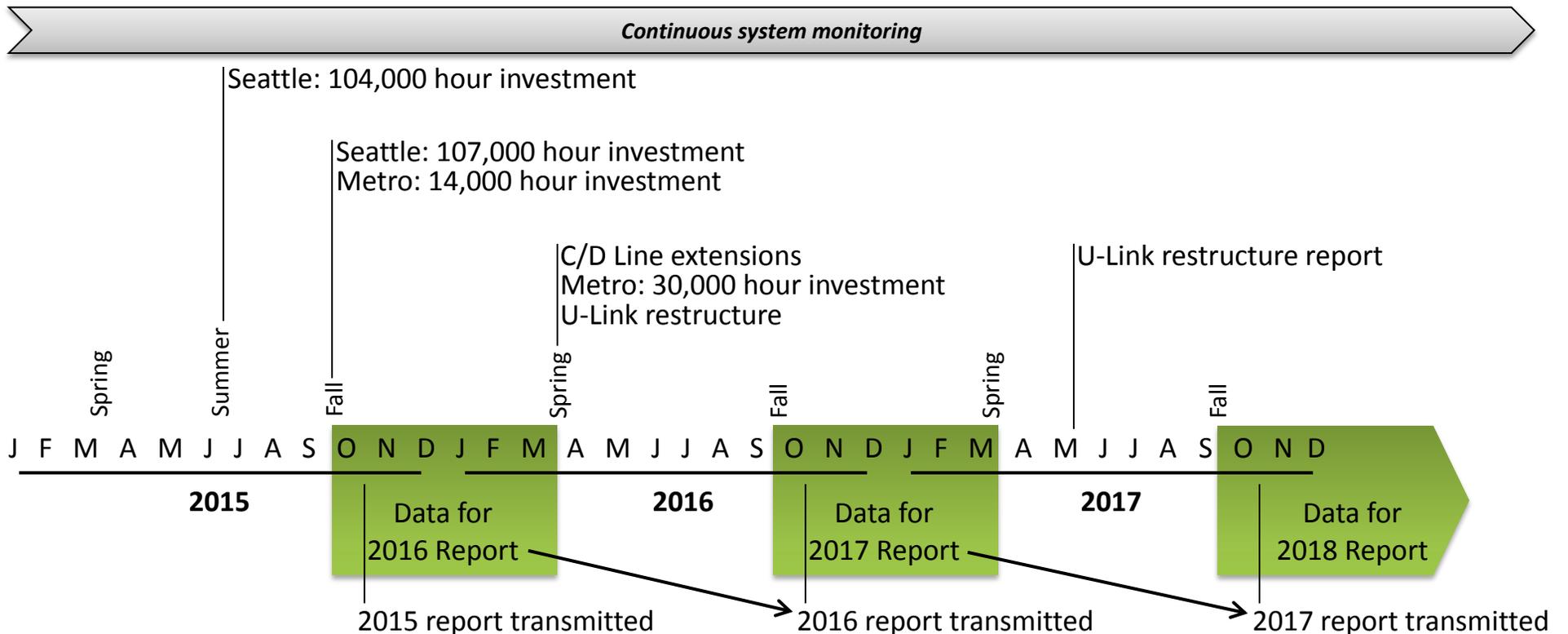
Metro continuously uses data to monitor system performance, identify trends, and spot problem areas. Adjustments are made to improve the service we provide to our customers. Metro issues a comprehensive report – the Service Guidelines Report – once per year. Previously, when Metro conducted three service changes per year, data for the service guidelines report was collected from February through June. With the shift to conducting only two service changes per year, data for the report will be collected from late September to mid-March.

Service Guidelines Reports are submitted to council by October 31 of each year. With the shift in the data collection period, this due date could be adjusted.

Current Year

The data collection period for the 2016 report (the left-most green box below) began in late September 2015 and will conclude in late March 2016. Our data cutoff coincides with the spring service change, which, as depicted below, includes the U-Link restructure. Therefore, the *data used to generate the 2016 report* will not reflect the restructure. However, Metro will be closely monitoring the system after the spring service change and will make necessary adjustments to ensure riders are served to the best extent possible. A separate report on the effects of the restructure is due in March 2017.

The restructure itself will be directly reflected in data collected in late 2016 – early 2017 to generate the 2017 report.



Investment need breakdowns by subarea and service type

All figures are listed as annual service hours as of spring 2015.

Current System Size

	Hours	%		Hours	%
East	530,000	16%	Urban	2,413,000	71%
South	755,000	22%	Suburban	937,000	28%
West	2,121,000	62%	DART/Shuttles	56,000	2%
	3,406,000	100%		3,406,000	100%

Priority 1: Reduce Crowding

	2015 Service Guidelines Report		2015 Revised Guidelines	
	Hours	%	Hours	%
East	1,300	9%	1,190	19%
South	1,300	9%	250	4%
West	11,800	82%	4,800	77%
Urban	14,000	97%	4,640	74%
Suburban	400	3%	1,600	26%
DART/Shuttles	-	-	-	-
Total	14,400	100%	6,240	100%
Net change:			-8,160	

Priority 2: Improve Reliability (No Change)

	2015 Service Guidelines Report		2015 Revised Guidelines	
	Hours	%	Hours	%
East	2,150	8%	2,150	8%
South	5,925	25%	5,925	25%
West	15,475	67%	15,475	67%
Urban	19,450	83%	19,450	83%
Suburban	4,100	17%	4,100	17%
DART/Shuttles	-	-	-	-
Total	23,550	100%	23,550	100%
Net change:			0	

Priority 3: Meet Target Service Levels

	2015 Service Guidelines Report		2015 Revised Guidelines	
	Hours	%	Hours	%
East	58,950	14%	133,000	21%
South	165,350	38%	224,000	36%
West	209,400	48%	270,000	43%
Urban	229,600	53%	280,000	45%
Suburban	176,000	40%	289,000	46%
DART/Shuttles	28,100	7%	58,000	9%
Total	434,000	100%	627,000	100%
Net change:			+193,000	

Investment needs as percent of system size (revised guidelines)

System/Priority	Annual Hours	% of system size
System	3,406,000	100%
Priority 1	6,240	0.2%
Priority 2	23,550	0.7%
Priority 3	627,000	18.4%

Access to Transit Phase 2 Report Summary

The Access to Transit Study

The Phase 2 Report is the third and final report of King County Metro's two-year Access to Transit Study required by King County Ordinance 17641, Section 3. It is due on December 31, 2015.

The results of the study are presented in three separate reports. What's been transmitted previously:

1. **Work Plan** – December 31, 2013
2. **Phase 1** – December 31, 2014.
Different modes used to access transit and the infrastructure that supports them.
3. **July Report** – July 1, 2015
How access to transit is defined, how people access transit in King County and next steps for Metro

About the Phase 2 Report

It focuses on needs reporting, funding, policies and regional coordination. It also recommends next steps for Metro to

What we've heard

1. Many park-and-rides around the region are overcrowded.
2. Biking and walking infrastructure connecting to transit is inadequate in various places around the county.
3. Transit-to-transit and other last-mile connections are important, especially as the regional transit network grows.
4. Working with jurisdictions and other agencies is critical to improving access, and Metro needs to take a leadership role.
5. Metro's measures and reporting do not fully capture the multiple facets of transit access or identify a clear path to address them.

What we've learned and what we're doing

Highlights of our findings:

I. Measures and reporting. Metro could expand on our existing measures and data collection to more fully assess the opportunities for all people to access public transportation and to identify opportunities for improving access.

Actions:

- 1) Metro is proposing modified and new measures as part of the updates to the strategic plan.
Metro is developing new tools and initiating expanded data collection to better understand access barriers and identify steps for improvement.

II. Funding. A major portion of Metro's capital program is dedicated to ongoing maintenance and operation of existing facilities. Major new investments will require both additional dedicated funding and partnerships with other agencies, local jurisdictions and the private sector. An investment strategy will be required to identify and prioritize the most effective projects.

Actions:

- 1) Metro will continue to work with partners to identify financial partnership opportunities, grants and other resources to implement new capital infrastructure and programs to enhance transit access.
- 2) Metro will seek opportunities to further develop and apply tools and resources to evaluate access to transit needs and identify and prioritize projects.
- 3) Metro will begin to identify investment priorities through the development of its long-range plan and the 2017-2018 budget process.

III. Policies and practices

Bike and pedestrian. A multimodal approach to providing and enhancing access to transit is important. Good transit access by all modes is essential to supporting ridership and making transit more attractive and convenient. While all modes have a role, many agencies prioritize improvements that will do the most to increase ridership at the lowest cost.

Actions:

- 1) Metro will develop policy language in the long-range plan to guide Metro's multimodal approach to transit access improvements.
- 2) Metro will work collaboratively with local jurisdictions, other agencies, private organizations and others to improve bike and pedestrian connections to transit. Metro's focus will be in the transit service and transit stop element of these connections.

Transit parking. Transit parking is an important access mode and many agencies provide park-and-ride or other parking as a means of access to transit. Many agencies and cities are working to find strategies for responding to parking demand that use resources efficiently, are affordable, and are consistent with smart-growth plans adopted by cities.

Actions:

- 1) Metro will work collaboratively with local jurisdictions, other agencies, private organizations and others to respond to demand for transit parking by better managing our resources and providing more supply where warranted.

Transit-oriented development (TOD). Transit-oriented development can increase access to transit by promoting walkable, compact communities and providing affordable housing near transit. It can help increase, maintain or decrease parking, depending on the community vision.

Actions:

- 1) Metro will encourage and pursue transit-oriented development (TOD) opportunities with cities, other transit agencies and private developers.

Safety and security. Agency programs that promote safety and security are critical as people are more likely to utilize facilities where they feel safe.

Action

- 1) Metro will continue to promote safe and secure access to transit and seek opportunities to collaborate with jurisdictions to make improvements.

IV. Regional coordination. Transit access is a regional issue and Metro will need to work closely with other agencies and jurisdictions to plan, design, fund, build and maintain an integrated transit system with good access.

Action

- 1) Metro will continue to plan and coordinate with regional players who have a role in access to transit issues

Report Organization

Section One

Findings and next steps

Section Two

- I. Measures and reporting
- II. Funding
- III. System access policies and practices
- IV. Transit parking policies and practices
- V. Transit-oriented development policies and practices

References

Appendices