

Estimated Ridership Impacts of the 600,000 Hour Reduction Scenario (Presented at the 4/7/11 RTC Workshop)

Introduction

This document outlines the assumptions used in estimating ridership loss associated with the priorities for reduction described on page SG-15 of the guidelines document. In general, ridership was estimated based upon the change in hours at the existing productivity for each time period of each route. However, in many cases, especially those involving restructures of service, Metro expects that many riders using routes that are reduced or eliminated will switch to other routes providing similar or comparable service. In these cases, Service Planning staff produced estimates that reflected the other route options.

Using this method, Metro’s annual ridership is estimated to drop by approximately 9 million annual rides. With this drop in ridership and annual service hours, productivity would actually increase nearly 11% to 34.6 rides per platform hour from 31.2 rides per platform hour in 2009.

The service guidelines’ priorities used in the development of the 600,000 annual service hours reduction scenario, cutting 17.5 percent of the system, resulted in a projected loss of only 8.5 percent of Metro’s ridership. As a comparison, if the approach to service reduction was to eliminate an equal amount – 17.5 percent – in every route in the system, resulting in the loss of ridership equal to the average productivity of the entire system (31.2), the resulting loss of ridership would be 18.7 million annual boardings.

The ridership estimates in this analysis reflect one scenario using the reduction priorities. An actual proposal would undergo additional scrutiny through public review that may result in a different outcome. It should also be noted that an actual proposal would go through an additional level of analysis to assure that the projected ridership could be accommodated within the available capacity, without exceeding the Passenger Load guidelines on page SG-9 of the Service Guidelines document.

	Annual Hours	Ridership (Boardings)	Average Hourly Productivity*
Existing (2009)	3,433,000	107,230,000	31.2
Results of 600,000 Reduction Scenario	2,833,000	97,900,000	34.6

Annual Boardings/Annual Platform Hours = Average Hourly Productivity

Ridership Estimates for Priority 1 -- Reduce Low Productivity Services

There are four categories of reductions in Priority 1 of service reductions (page SG-15, Reduce low Productivity Services):

- All-day routes that duplicate or overlap with other routes on corridors on the All-day and Peak Service Network
- Peak routes failing one or both of the criteria
- All-day routes on corridors that are over-served
- All-day routes on corridors that are appropriately served.

Category	Change in Annual Hours	Change in Annual Riders
All-day routes that duplicate or overlap with other routes on corridors on the All-day and Peak Service Network	-85,000	-1,290,000
Peak routes failing one or both criteria	-84,000	-1,080,000
All-day routes on over-served corridors	-31,000	-200,000
All-day routes on appropriately served corridors	-20,000	-150,000
TOTAL	-220,000	-2,720,000

Many of the routes reduced in this priority have other Metro routes that are viable alternatives. Therefore, we assumed that the Metro system would retain 10% of the rides on the services to be reduced.

The productivity of the services reduced in Priority one is approximately 12 rides per platform hour, reflecting the fact that reductions are on low productivity services.

Ridership Estimates for Priority 2 -- Restructure Service

Using the guideline triggers (page SG-10 of the Guidelines document) Metro has identified fourteen areas where routes can be restructured in order to eliminate redundancy, improve efficiency, better match service with ridership and respond to land use and transportation system changes. Over the past couple decades, Metro has performed a number of restructures and has found that the changes associated with restructures improved productivity of the resulting services.

The following assumptions were made in determining the ridership changes for individual routes involved in restructures:

- If a route was deleted without any viable replacement, 100% of the rides were lost.
- If a route was deleted, but a comparable alternative was provided by another route only 50% of the rides were considered lost.
- If a route was deleted and replaced by multiple routes serving different segments of the deleted route, between 50% and 100% of the rides were considered lost depending on the replacement service.
- If a route was shortened, frequency reduced or modified in another way designed to improve its efficiency or productivity, 90% of the rides were considered lost at the route’s existing productivity level. For example; if a route's headway was increased from 30 to every 60 minutes it was assumed that only 10 percent of the riders shifted to the remaining trips.
- If a route received investment as a result of consolidation routes, rides were added to the route receiving the investment at 110% of its existing productivity.
- If a new route was added, its productivity was determined using productivity of a comparable route or routes.

The majority of potential restructures are within the City of Seattle. Given the relatively higher productivity of Seattle routes the resulting loss in riders per platform hour within these restructure efficiencies is approximately 16.7. However, if the reduction were taken by simply reducing frequency and hours of operation on individual routes rather than restructuring service as described in the scenario, the loss of rides per platform hour would be significantly higher.

Restructures – Resulting Changes	
Change in Hours	Change in Annual rides
-256,000	-4,430,000

Ridership Estimates for Priority 3 – Reduce lower productivity services above the 25% performance threshold

There are three categories of reductions in the third priority of service reductions (higher than the 25% threshold but still relatively low productivity services):

- All-day routes that duplicate or overlap with other routes on the All-day and Peak Service Network
- Peak routes that meet both peak route criteria or are above the 25% threshold
- All-day routes on corridors that are appropriately served

Category	Change in Annual Hours	Change in Annual Riders
All-day routes that duplicate or overlap with other routes on corridors on the All-day and Peak Service Network	-19,000	-290,000
Peak routes that meet both peak route criteria or are above the 25% threshold	-38,000	-670,000
All-day routes on appropriately served corridors	-67,000	-1,230,000
TOTAL	-124,000	-2,190,000

The routes involved in Priority one and two reductions have slightly fewer alternatives than routes reduced in Priority three. It is assumed that Metro would only retain 5% of riders of these services. For routes involved in category three reductions, we assumed that 10% of the rides would continue to be carried on the trips that remained after the frequency reduction.

Priority 3 resulted in an estimated loss in rides per platform hour of 17.7

Summary of Ridership Estimates

Based on the above priorities, the breakdown of estimated riders lost is as follows:

Priority	Hours of service cut (% of 600,000 hours cut)	Estimated riders lost (% of total riders lost)
1 - Low Productivity	220,000 (37%)	2,720,000 (29%)
2 – Restructures	256,000 (43%)	4,430,000 (47%)
3 – Above 25% Productivity	124,000 (21%)	2,190,000 (24%)
TOTAL	600,000 (100%)	9,340,000 (100%)

As a result of these reductions the projected productivity of the Metro system would increase by nearly 11% due to the elimination or reduction of services that perform below the Metro Transit Network average hourly system productivity and the improved efficiency of routes that result from restructures.

Step by Step process to cut 600,000 annual hours of service

Step by Step process to cut 600,000 annual hours of service									
Priority One - Reduce low productivity services	Change in Hours				Change in Rides				
SUBSTEP	Peak	Off Peak	Night	Total	Peak	Off Peak	Night	Total	Productivity
All-day corridors that duplicate others	(33,524)	(46,400)	(5,381)	(85,304)	(509,648)	(726,262)	(51,354)	(1,287,263)	Average
Peak routes failing all or one criteria	(82,390)	(1,556)	0	(83,946)	(1,066,474)	(18,479)	0	(1,084,953)	Rides per
All-day corridors on over-served	(10,554)	(9,363)	(10,171)	(30,088)	(68,623)	(79,361)	(56,202)	(204,186)	Hour
All-day corridors with appropriate service	(7,393)	(12,589)	0	(19,982)	(47,695)	(100,127)	0	(147,822)	Eliminated
	(133,861)	(69,907)	(15,552)	(219,320)	(1,692,439)	(924,229)	(107,556)	(2,724,224)	12.4
Step Breakdown	61%	32%	7%						
Priority Two - Restructure Corridors									
Restructure	Change in Hours				Change in Rides				
SUBSTEP	Peak	Off Peak	Night	Total	Peak	Off Peak	Night	Total	Productivity
Queen Anne	3,999	(8,105)	(1,682)	(5,789)	287,587	(442,532)	(52,049)	(206,993)	Average
Ballard/Fremont/Magnolia	(3,235)	(12,135)	(13,926)	(29,297)	(46,848)	(377,158)	(149,901)	(573,907)	Rides Per
Central Seattle	(30,672)	(30,433)	(18,687)	(79,792)	(1,155,432)	(720,681)	(342,714)	(2,218,827)	Hour
U. District/NE Seattle	(11,543)	(35,154)	(9,512)	(56,208)	(11,986)	(650,519)	(70,360)	(732,865)	Eliminated
West Seattle	(7,869)	(2,085)	(5,388)	(15,342)	(119,591)	(11,662)	(67,179)	(198,433)	
Rainier Valley/Duwamish/Burien	(3,138)	(14,174)	(7,048)	(24,360)	(582)	(208,999)	(8,681)	(218,261)	
Renton Highlands	(1,458)	(2,087)	0	(3,545)	(12,870)	(14,700)	0	(27,570)	
Kent/Kent East Hill/Star Lake	(6,598)	0	0	(6,598)	95,663	0	0	95,663	
Federal Way	(12,438)	(2,803)	(567)	(15,807)	(168,150)	(40,948)	(6,807)	(215,905)	
Auburn	0	(2,698)	0	(2,698)	0	(11,743)	0	(11,743)	
Bellevue-Eastgate-Issaquah	(7,005)	1,307	752	(4,946)	(76,338)	26,721	5,544	(44,074)	
Kirkland/Totem Lake	(8,516)	3,586	2,132	(2,799)	(83,297)	49,631	19,041	(14,625)	
Newcastle	(2,225)	(1,530)	0	(3,755)	(15,354)	(1,530)	0	(16,884)	
Mercer Island	(4,843)	0	0	(4,843)	(41,521)	0	0	(41,521)	
	(95,541)	(106,312)	(53,927)	(255,780)	(1,348,718)	(2,404,119)	(673,107)	(4,425,944)	17.3
Step Breakdown	37%	42%	21%						
Priority Three - Reduce Services above low productivity threshold									
SUBSTEP	Change in Hours				Change in Rides				
SUBSTEP	Peak	Off Peak	Night	Total	Peak	Off Peak	Night	Total	Productivity
Corridors that duplicate others	(6,459)	(11,390)	(1,165)	(19,013)	(103,407)	(174,313)	(12,514)	(290,234)	Avg Rides
Peak Corridors above the 25% threshold	(37,857)	0	0	(37,857)	(665,936)	0	0	(665,936)	per Hour
All-day corridors with appropriate service	(11,400)	(47,189)	(7,932)	(66,520)	(175,808)	(975,194)	(77,455)	(1,228,457)	Eliminated
	(55,716)	(58,578)	(9,096)	(123,391)	(945,150)	(1,149,507)	(89,969)	(2,184,627)	17.7
Step Breakdown	45%	47%	7%						
TOTAL OF ALL STEPS									
	(285,118)	(234,798)	(78,575)	(598,490)	(3,986,308)	(4,477,855)	(870,632)	(9,334,795)	15.6
	48%	39%	13%						
Annual Service Hours (2009)									
	1,587,275	1,288,444	557,365	3,433,083	49,571,826	45,580,847	12,081,702	107,234,374	31.2
Cut as a % of 2009 service hours									
	-18%	-18%	-14%	-17%					
Remaining Hours after Cuts									
	1,302,157	1,053,646	478,790	2,834,593	45,585,518	41,102,992	11,211,070	97,899,579	34.5
% of system total									
	46%	37%	17%		47%	42%	11%		