King County METRO

Peer Agency Comparison on Performance Measures

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Introduction

Every year, King County Metro Transit compares its performance to that of peer agencies using data from the National Transportation Database (NTD). Metro compares itself to 29 of the other largest bus transit agencies in the U.S. (as defined by the number of passenger boardings). The comparisons include only the agencies' *bus* modes (motor bus, trolley bus, commuter bus, and rapid bus, as defined by the NTD).

The measures presented in this report are from 2016, with comparisons to previous years (2015, 2011, and 2006). NTD annual data are not available until late the following year, so the analysis is delayed by about one year. Other challenges to this peer analysis include the fact that only bus performance is measured, but many agencies also operate extensive rail systems around which bus networks are structured. This may affect performance on the measures compared.

Also, it is not always clear what has been included and excluded in the NTD reports. In previous years, Metro's NTD submittals included Sound Transit bus service operated by Metro in some of the statistics. This peer analysis does not include Sound Transit service as part of Metro service, but the composition of other agencies' reports is uncertain. That is one reason Metro presents the averages for a robust cohort of 30 peers.

2016 saw major changes in Metro's service that are reflected in the measures in the following pages. Metro restructured bus service to connect with Sound Transit's extension of Link light rail to the University of Washington and Capitol Hill. Metro and the City of Seattle invested in new service hours to improve reliability and increase service frequency.
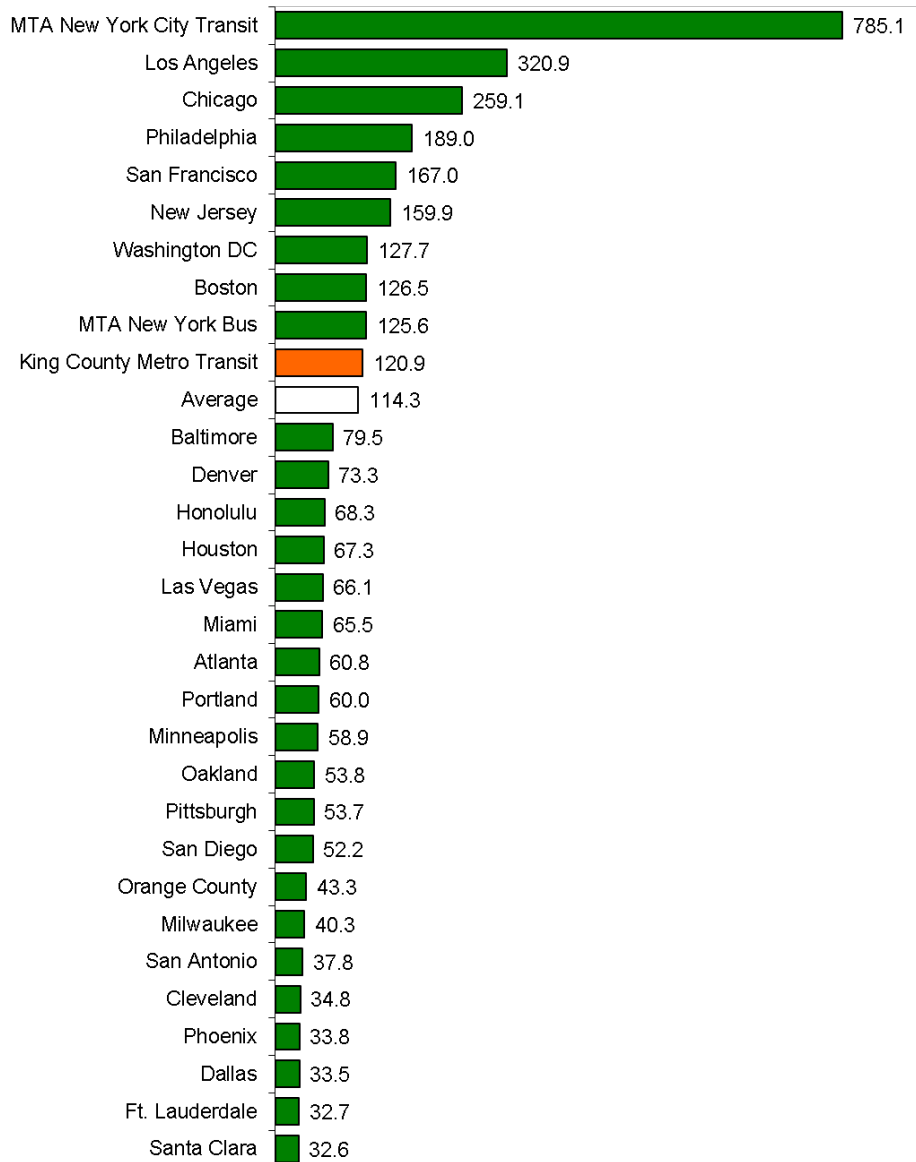
Over the years, Metro has done well on the *productivity* ratios (boardings per hour and passenger miles per vehicle mile), and has seen strong ridership growth. Metro had been about average in the *cost-effectiveness* ratios (cost per boarding and cost per passenger mile) but saw a dip in 2016 as investments were made in additional service that will grow ridership over time. Metro lags its peers in the *cost-efficiency* ratios (cost per hour and cost per mile), but these measures improved in 2016 as more service was added at a lower, marginal cost per hour and per mile.

	2016			1-year Annual Growth			5-year Annual Growth			10-year Annual Growth		
	Metro	Rank	Peer Avg	Metro	Rank	Peer Avg	Metro	Rank	Peer Avg	Metro	Rank	Peer Avg
Boardings (mil)	120.9	10	114.3	-0.1%	8	-3.1%	1.5%	3	-0.6%	1.6%	3	-0.8%
Passenger miles (mil)	518.8	6	412.1	-2.8%	18	-1.2%	1.6%	12	0.5%	0.7%	11	-0.1%
Boardings per hour	31.4	11	31.4	-6.1%	18	-4.6%	-0.2%	7	-1.8%	0.5%	5	-1.2%
Pass. miles per mile	11.4	11	10.2	-7.0%	22	-3.3%	1.1%	10	-0.3%	0.2%	16	0.0%
Cost per hour[1]	$140.86	20	$131.37	-1.4%	8	2.5%	1.7%	16	1.7%	2.6%	14	2.7%
Cost per mile[1]	$11.88	21	$11.28	0.3%	11	2.1%	3.0%	22	2.1%	3.1%	17	3.2%
Cost per boarding[1]	$4.49	18	$4.47	5.0%	12	7.7%	1.9%	7	3.6%	2.1%	4	4.0%
Cost per pass. mile[1]	$1.05	14	$1.13	7.9%	22	6.0%	1.9%	12	2.5%	2.9%	16	3.2%
Farebox recovery[2]	30.1%	8	25.5%	-0.7%	8	-1.6%	1.9%	4	-2.5%	9.7%	2	-2.6%

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[1] For the financial ratios, the rank is from lowest cost to highest cost, so a lower number in the rank is better than a higher number for all measures.

[2] The change in farebox recovery is in total percentage point change. For instance, Metro's farebox recovery ratio was 30.1% in 2016 and 20.4% in 2006 – a 9.7 percentage point difference.

Bus Boardings 2016
(in Millions)

City	Millions
MTA New York City Transit	785.1
Los Angeles	320.9
Chicago	259.1
Philadelphia	189.0
San Francisco	167.0
New Jersey	159.9
Washington DC	127.7
Boston	126.5
MTA New York Bus	125.6
King County Metro Transit	120.9
Average	114.3
Baltimore	79.5
Denver	73.3
Honolulu	68.3
Houston	67.3
Las Vegas	66.1
Miami	65.5
Atlanta	60.8
Portland	60.0
Minneapolis	58.9
Oakland	53.8
Pittsburgh	53.7
San Diego	52.2
Orange County	43.3
Milwaukee	40.3
San Antonio	37.8
Cleveland	34.8
Phoenix	33.8
Dallas	33.5
Ft. Lauderdale	32.7
Santa Clara	32.6

Bus Boardings: A boarding is an *unlinked* passenger trip. Passengers are counted each time they board a vehicle, no matter how many vehicles they use to travel from their origin to their destination.[3]

2016 peer rank: Metro had 120.9 million bus boardings in 2016 (peer rank: 10th highest).

Trends: 2016 saw the extension of Sound Transit's Link light rail from downtown Seattle to Capitol Hill and the University of Washington. This new Link segment replaced very productive Metro bus routes. However, Metro's reconfiguration of the bus system to connect people with Link, plus the addition of new service, helped keep the bus ridership loss system-wide to 0.1%. (The combined growth in boardings on Metro bus and Link was more than 5%.)
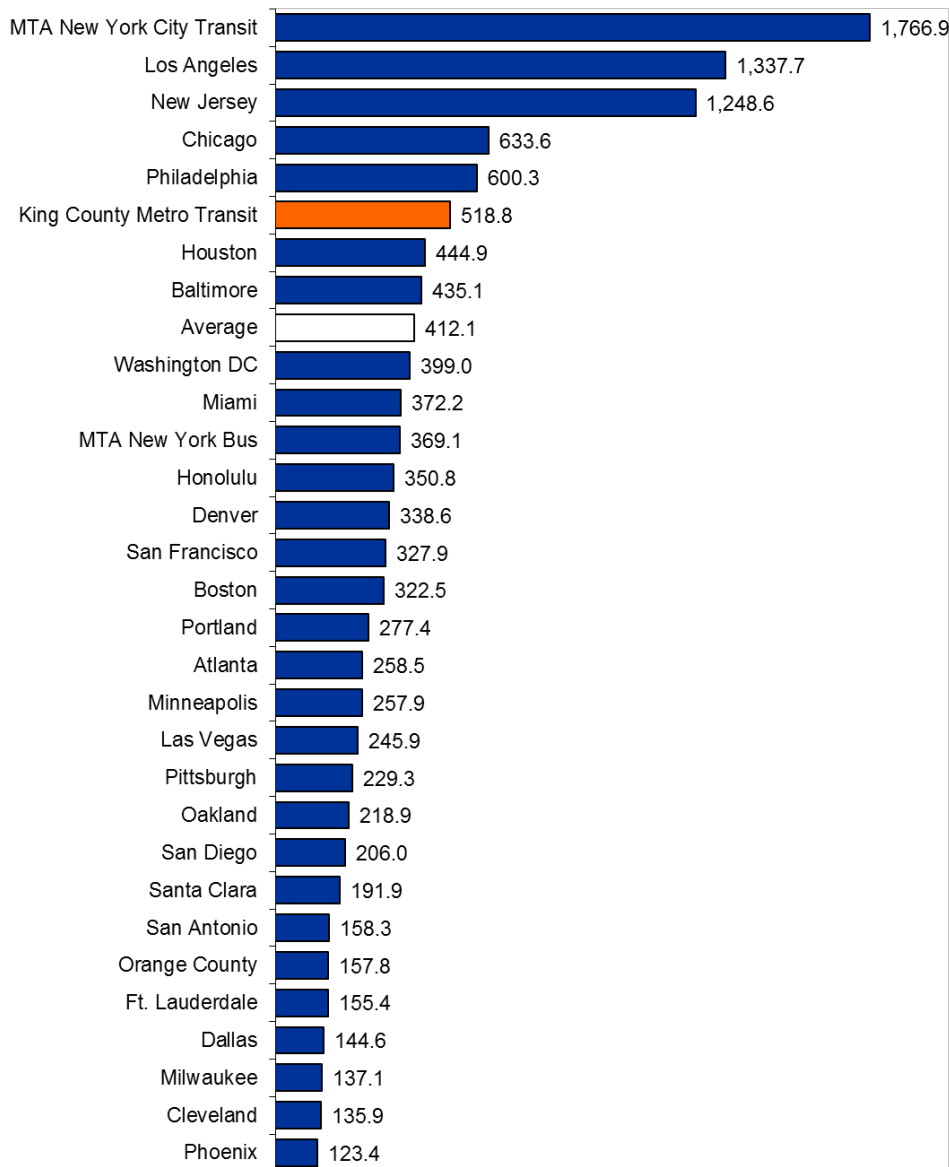
Over the past several years, Metro has been bucking the national trend of declining ridership. Those declines are likely the result of low fuel prices that make automobile travel comparably cheaper.

Annual Change	Metro	Rank	Peer Avg.
1-year trend	-0.1%	8	-3.1%
5-year trend	1.5%	3	-0.6%
10-year trend	1.6%	3	-0.8%

Metro had the third highest growth rate among the 30 peers over the past five and 10 years. Metro benefits from a strong local economy, which creates a higher demand for commute trips. Metro has invested in highly productive routes such as RapidRide, which have helped propel the longer-term growth. Metro has a very robust employer-provided pass program that has grown strongly over the years. Metro investments and purchases by the City of Seattle starting in 2015 helped offset ridership losses stemming from budget-driven service reductions in 2014.

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[3] National Transit Database.

Passenger Miles Traveled 2016
(in Millions)

Agency	Passenger Miles
MTA New York City Transit	1,766.9
Los Angeles	1,337.7
New Jersey	1,248.6
Chicago	633.6
Philadelphia	600.3
King County Metro Transit	518.8
Houston	444.9
Baltimore	435.1
Average	412.1
Washington DC	399.0
Miami	372.2
MTA New York Bus	369.1
Honolulu	350.8
Denver	338.6
San Francisco	327.9
Boston	322.5
Portland	277.4
Atlanta	258.5
Minneapolis	257.9
Las Vegas	245.9
Pittsburgh	229.3
Oakland	218.9
San Diego	206.0
Santa Clara	191.9
San Antonio	158.3
Orange County	157.8
Ft. Lauderdale	155.4
Dallas	144.6
Milwaukee	137.1
Cleveland	135.9
Phoenix	123.4

Annual Change	Metro	Rank	Peer Avg.
1-year trend	-2.8%	18	-1.2%
5-year trend	1.6%	12	0.5%
10-year trend	0.7%	11	-0.1%

Passenger miles traveled: Passenger miles are the cumulative sum of the distances ridden by all passengers. In some ways, this is a better indicator of total service provided than are boardings. A transit agency's core business is to move passengers over distances. A system that has many transfers between buses will see higher boardings but not a corresponding increase in passenger miles.
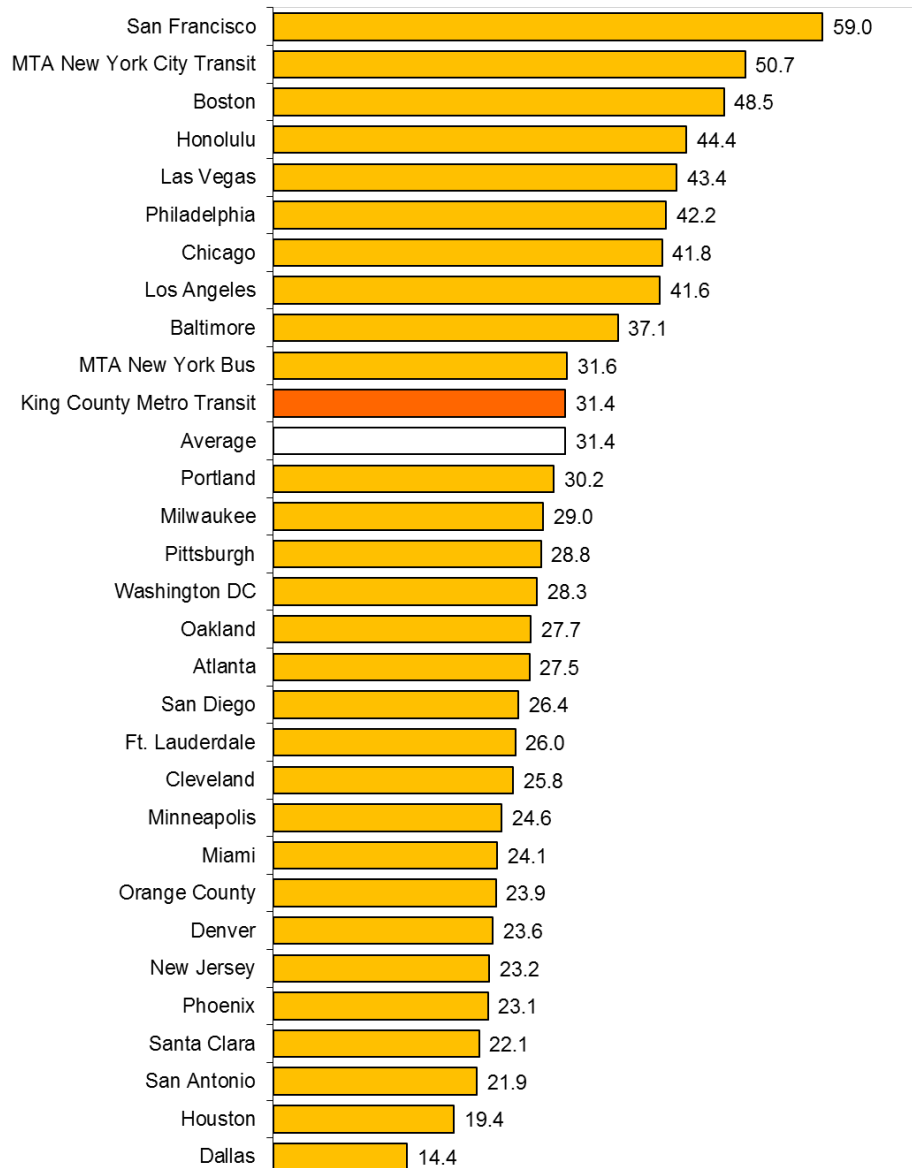
2016 peer rank: Metro had 518.8 million passenger miles traveled in 2016 (peer rank: 6th highest). The peer average was 412.1 million.

Trends: 2016 saw a 2.8% decline in Metro passenger miles, and over the past 10 years Metro's passenger miles grew more slowly than boardings. This trend is the result of a declining average trip length (passenger miles per boarding) – about 8% less than in 2006. This decline was driven largely by the introduction and expansion of Link light rail and changes in the composition of Metro's service. The advent of Link in 2009 replaced many long trips, particularly between downtown Seattle and Sea-Tac Airport. In 2009 and 2016, Metro reconfigured the bus system to connect riders with Link. Some long bus trips became bus-rail trips with shorter distances by bus. Further, Sounder commuter rail has been growing and replacing some long bus commutes. These impacts on Metro's average trip length were offset somewhat by the closing of the downtown Seattle Ride Free Area, the source of many short bus trips. Overall, though, Metro's average bus trip lengths have declined, so passenger miles have not grown as fast as boardings.

Boardings Per Vehicle Hour
2016

City	Boardings
San Francisco	59.0
MTA New York City Transit	50.7
Boston	48.5
Honolulu	44.4
Las Vegas	43.4
Philadelphia	42.2
Chicago	41.8
Los Angeles	41.6
Baltimore	37.1
MTA New York Bus	31.6
King County Metro Transit	31.4
Average	31.4
Portland	30.2
Milwaukee	29.0
Pittsburgh	28.8
Washington DC	28.3
Oakland	27.7
Atlanta	27.5
San Diego	26.4
Ft. Lauderdale	26.0
Cleveland	25.8
Minneapolis	24.6
Miami	24.1
Orange County	23.9
Denver	23.6
New Jersey	23.2
Phoenix	23.1
Santa Clara	22.1
San Antonio	21.9
Houston	19.4
Dallas	14.4

Boardings per vehicle hour: Vehicle hours are the hours that a vehicle travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service.[4] The ratio of boardings to vehicle hours is a key productivity measure in Metro's Annual System Evaluation (formerly called the Service Guidelines Report).

2016 peer rank: Metro had 31.4 boardings per hour in 2016 (peer rank: 11th highest). The peer average also was 31.4.

Trends: Metro had a 6.1% decline in boardings per hour in 2016. Metro and the City of Seattle added service hours to improve reliability and increase service frequency. Meanwhile, ridership growth remained flat as Link light rail replaced many bus passenger trips to the University of Washington and Capitol Hill. Experience shows that it takes a few years for significant ridership gains to occur in response to increased service, so we expect the boardings per hour to improve over time.
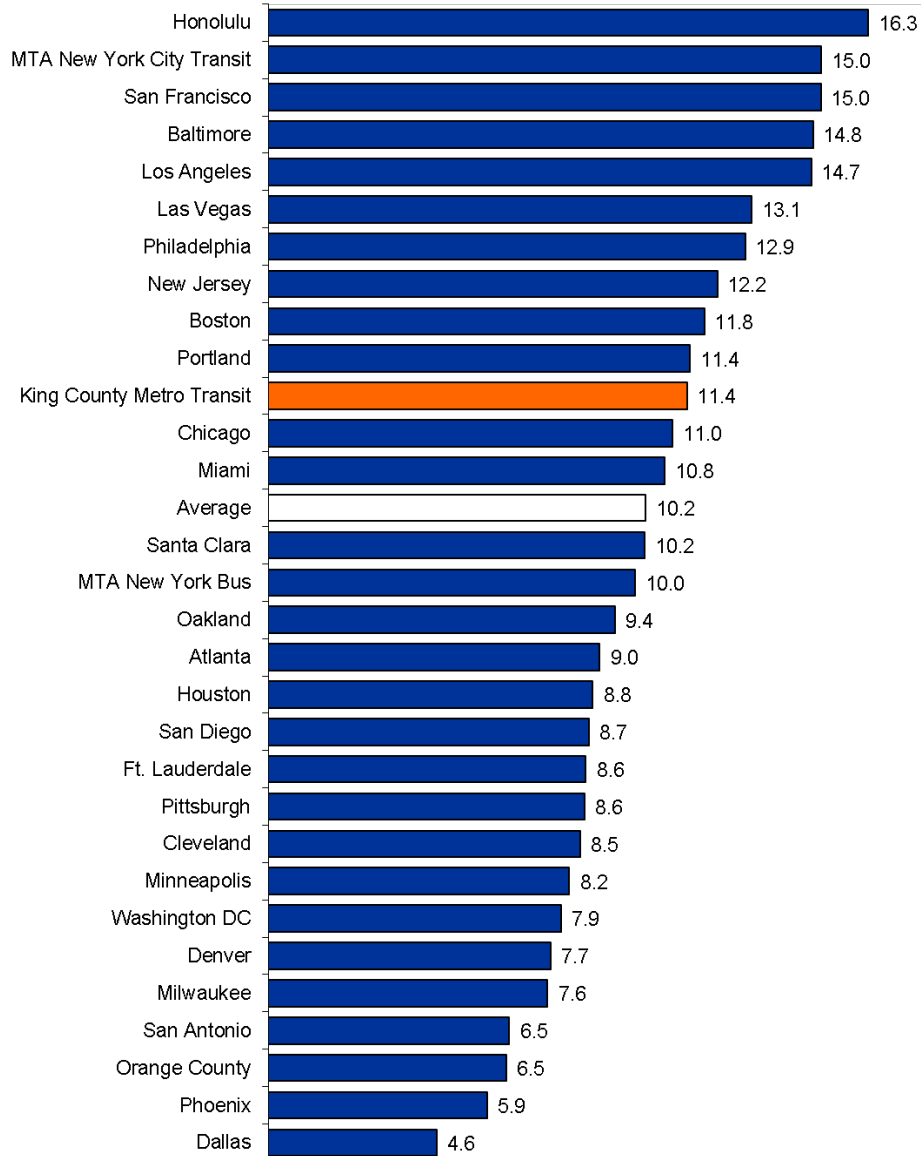
Over the past five and 10 years, Metro has been among the leading agencies in changes in boardings per hour. In addition to the steps to increase ridership mentioned in the boardings discussion, Metro has increased productivity through improved scheduling efficiency, reallocations of service hours from less productive routes to more productive routes, and restructuring of routes based on our Service Guidelines.

Annual Change	Metro	Rank	Peer Avg.
1-year trend	-6.1%	18	-4.6%
5-year trend	-0.2%	7	-1.8%
10-year trend	0.5%	5	-1.2%

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[4] National Transit Database.

Passenger Miles Per Vehicle Mile
2016

City	Value
Honolulu	16.3
MTA New York City Transit	15.0
San Francisco	15.0
Baltimore	14.8
Los Angeles	14.7
Las Vegas	13.1
Philadelphia	12.9
New Jersey	12.2
Boston	11.8
Portland	11.4
King County Metro Transit	11.4
Chicago	11.0
Miami	10.8
Average	10.2
Santa Clara	10.2
MTA New York Bus	10.0
Oakland	9.4
Atlanta	9.0
Houston	8.8
San Diego	8.7
Ft. Lauderdale	8.6
Pittsburgh	8.6
Cleveland	8.5
Minneapolis	8.2
Washington DC	7.9
Denver	7.7
Milwaukee	7.6
San Antonio	6.5
Orange County	6.5
Phoenix	5.9
Dallas	4.6

Passenger miles per vehicle mile: Vehicle miles are the miles that a vehicle travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service.[5] The ratio of passenger miles to vehicle miles is another key productivity measure in Metro's Annual System Evaluation.
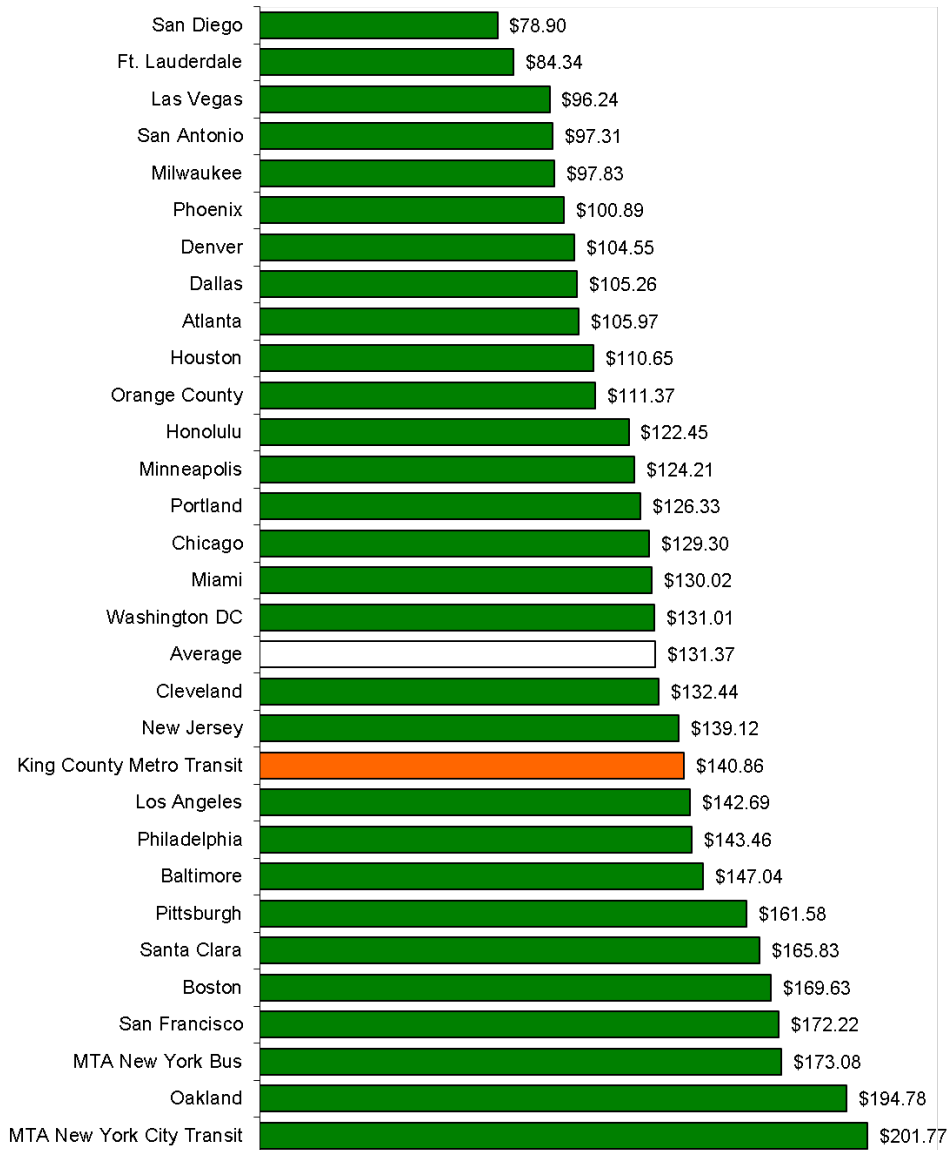
2016 peer rank: Metro had 11.4 passenger miles per vehicle mile in 2016 (peer rank: 11th highest). The peer average was 10.2.

Trends: 2016 saw a 7% decline in this ratio. A number of factors contributed to this decline. Service miles were added to the system, as described previously. Ridership gains were flat as the result of the extension of Link light rail. Further, the average trip length declined as Metro reconfigured the bus system to connect with light rail, and some long bus trips became bus-rail trips with shorter distances by bus. Declines in average trip length and the addition of vehicle miles to the system has also slowed the growth of passenger miles per vehicle mile over the long term.

Annual Change	Metro	Rank	Peer Avg.
1-year trend	-7.0%	22	-3.3%
5-year trend	1.1%	10	-0.3%
10-year trend	0.2%	16	0.0%

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[5] National Transit Database.

Operating Cost Per Vehicle Hour
2016

City	Cost
San Diego	$78.90
Ft. Lauderdale	$84.34
Las Vegas	$96.24
San Antonio	$97.31
Milwaukee	$97.83
Phoenix	$100.89
Denver	$104.55
Dallas	$105.26
Atlanta	$105.97
Houston	$110.65
Orange County	$111.37
Honolulu	$122.45
Minneapolis	$124.21
Portland	$126.33
Chicago	$129.30
Miami	$130.02
Washington DC	$131.01
Average	$131.37
Cleveland	$132.44
New Jersey	$139.12
King County Metro Transit	$140.86
Los Angeles	$142.69
Philadelphia	$143.46
Baltimore	$147.04
Pittsburgh	$161.58
Santa Clara	$165.83
Boston	$169.63
San Francisco	$172.22
MTA New York Bus	$173.08
Oakland	$194.78
MTA New York City Transit	$201.77

Operating cost per vehicle hour: Cost is the total operating expense for bus service. Cost per vehicle hour is a cost-efficiency ratio. It gauges the cost inputs of a unit of service because much of the cost is directly related to time in service.

2016 peer rank: Metro's cost per hour was $140.86 in 2016 (peer rank: 20th lowest). The peer average was $131.37.

A number of factors affect Metro's operating costs. Seattle is one of the most expensive markets in the country, and Metro has costs that many other agencies do not have. For instance, the Downtown Seattle Transit Tunnel adds to cost per hour, but this facility supports efficient operation in the Seattle core, reducing the number of service hours needed.

Metro is part of King County government, and one of the county's Strategic Plan goals is to support economy vitality. Metro's 60-foot articulated buses contribute to this goal by providing a high level of commuter service during peak periods, but therse coaches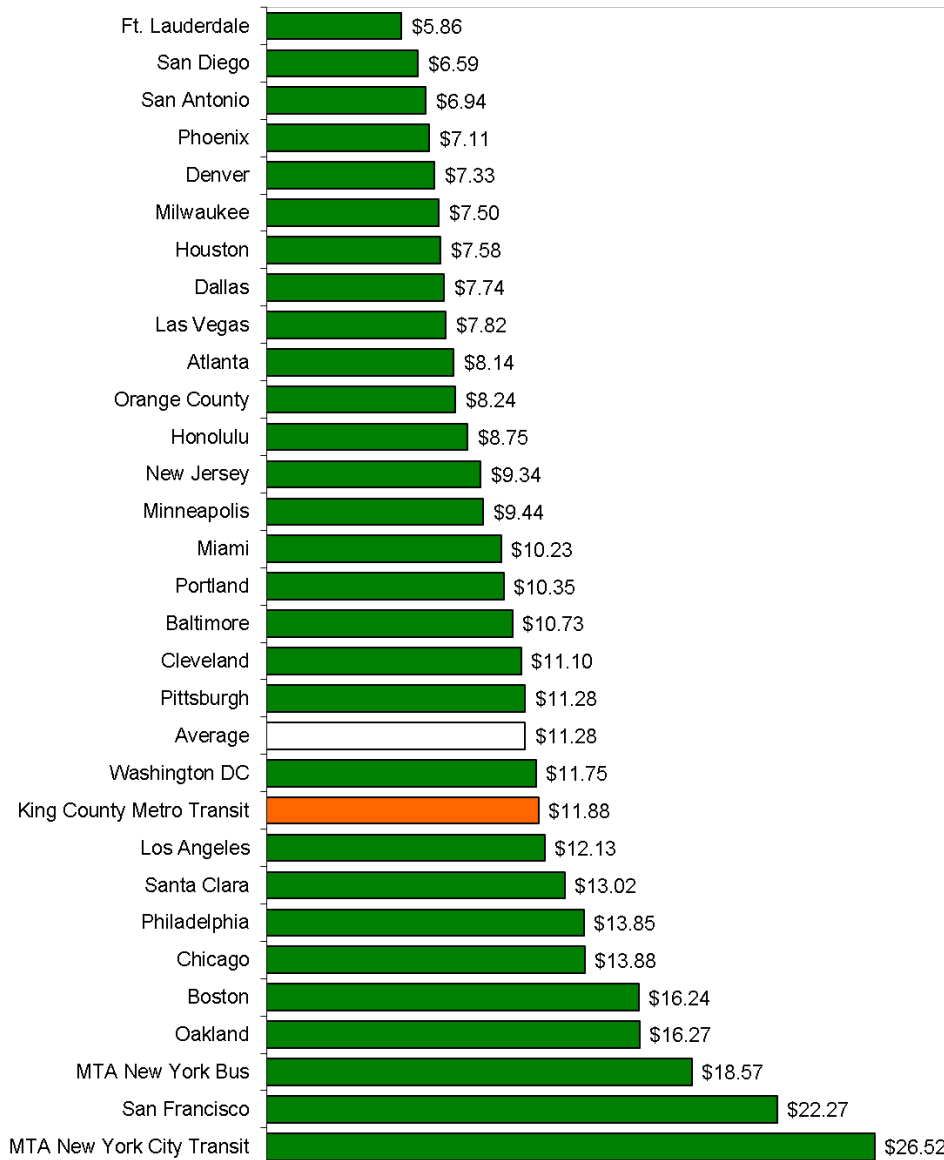 cost more to operate than smaller coaches. Metro also maintains a large network of park-and-rides that add costs. Another County goal is to promote a healthy environment. Metro's electric trolley buses not only minimize air pollution, they also operate quietly and are well-suited for climbing Seattle's steep hills, but are more expensive to operate than diesel coaches.

Annual Change	Metro	Rank[6]	Peer Avg.
1-year trend	-1.4%	8	2.5%
5-year trend	1.7%	16	1.7%
10-year trend	2.6%	14	2.7%

Trends: In 2016, Metro's operating cost per hour decreased 1.4%, in part because the addition of service hours enabled fixed costs to be spread out. The five- and 10-year increases in costs per hour were about the same as the peer average. Metro's focus on cost containment was evident over the longer term as the increases in cost per hour were slightly lower than inflation over five years and slightly higher than inflation over 10 years.

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[6] A lower-numbered rank means a lower increase in the cost ratio, so a lower number is better; first is the best rank.

Operating Cost Per Vehicle Mile
2016

City	Cost
Ft. Lauderdale	$5.86
San Diego	$6.59
San Antonio	$6.94
Phoenix	$7.11
Denver	$7.33
Milwaukee	$7.50
Houston	$7.58
Dallas	$7.74
Las Vegas	$7.82
Atlanta	$8.14
Orange County	$8.24
Honolulu	$8.75
New Jersey	$9.34
Minneapolis	$9.44
Miami	$10.23
Portland	$10.35
Baltimore	$10.73
Cleveland	$11.10
Pittsburgh	$11.28
Average	$11.28
Washington DC	$11.75
King County Metro Transit	$11.88
Los Angeles	$12.13
Santa Clara	$13.02
Philadelphia	$13.85
Chicago	$13.88
Boston	$16.24
Oakland	$16.27
MTA New York Bus	$18.57
San Francisco	$22.27
MTA New York City Transit	$26.52

Annual Change	Metro	Rank[7]	Peer Avg.
1-year trend	0.3%	11	2.1%
5-year trend	3.0%	22	2.1%
10-year trend	3.1%	17	3.2%

Operating cost per vehicle mile: This ratio is another cost-efficiency measure. It gauges the cost inputs of a unit of service, since much of the cost is directly related to distance traveled.

2016 peer rank: Metro's cost per mile was $11.88 in 2016 (peer rank: 21st lowest). The peer average was $11.28.

Cost per mile is affected by the geography and topography of Metro's service area. Puget Sound, Lake Washington, and the Ship Canal limit the street network, causing increased traffic congestion, and the region has steep hills along key travel corridors. These factors slow the travel speeds of Metro's buses. Since many costs accrue regardless of distance traveled, slower travel times mean higher costs per mile. Services in other congested cities (New York, Boston, Washington, D.C.) and in other cities with geographical constraints (San Francisco) are relatively expensive per mile. Cities with fewer such constraints are among the least expensive for transit operations, and many are also lower-cost metropolitan areas.
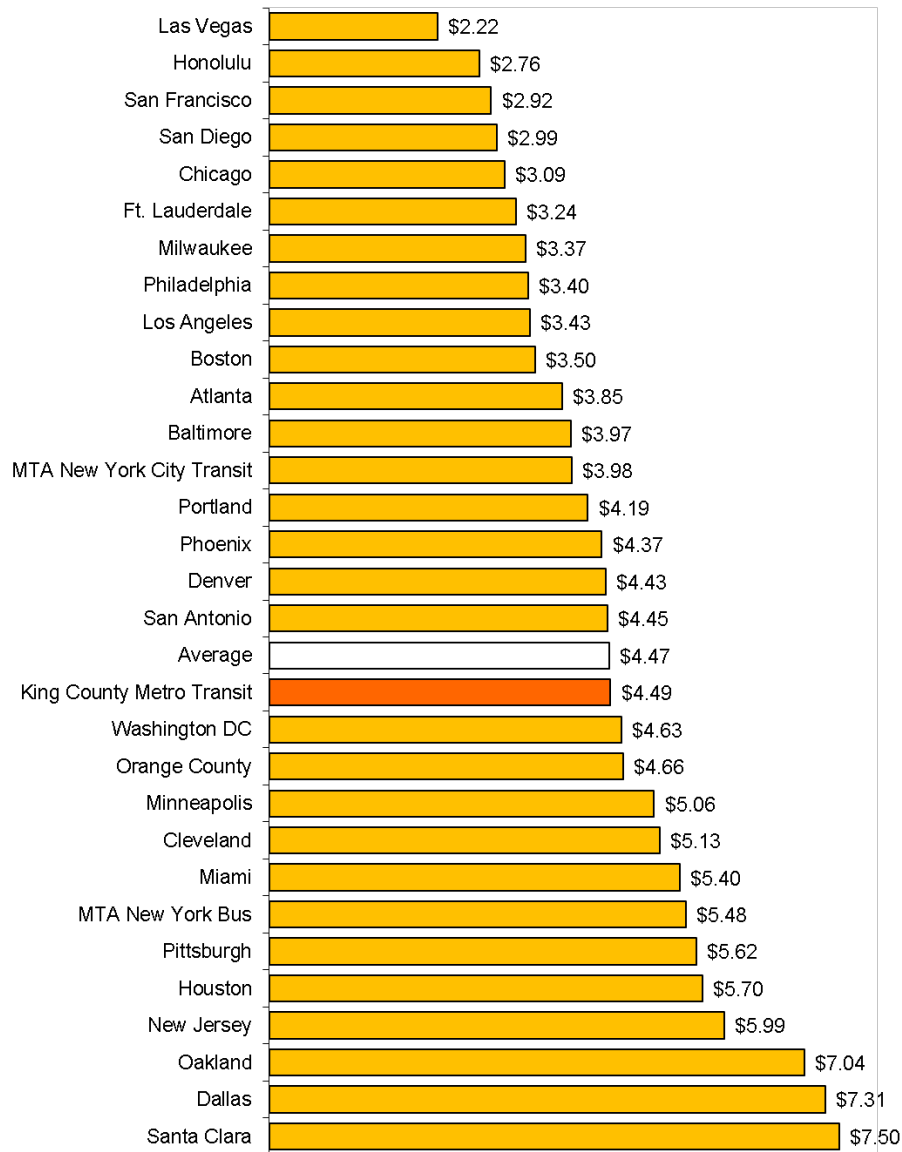
Trends: Even though Metro's cost per hour declined in 2016, its bus cost per vehicle mile increased 0.3%. The number of service miles in the system increased at a lower rate than the number of hours. Service investments by Metro and the City of Seattle generally were made in more congested areas where bus speeds are slower. Metro also added time between trips which allows for more reliable service. Over the longer term, congestion has increased throughout the service area, which also has slowed down service and resulted in faster increases in cost per mile than in cost per hour.

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[7] A lower-numbered rank means a lower increase in the cost ratio, so a lower number is better; first is the best rank.

Operating Cost Per Boarding
2016

City	Cost
Las Vegas	$2.22
Honolulu	$2.76
San Francisco	$2.92
San Diego	$2.99
Chicago	$3.09
Ft. Lauderdale	$3.24
Milwaukee	$3.37
Philadelphia	$3.40
Los Angeles	$3.43
Boston	$3.50
Atlanta	$3.85
Baltimore	$3.97
MTA New York City Transit	$3.98
Portland	$4.19
Phoenix	$4.37
Denver	$4.43
San Antonio	$4.45
Average	$4.47
King County Metro Transit	$4.49
Washington DC	$4.63
Orange County	$4.66
Minneapolis	$5.06
Cleveland	$5.13
Miami	$5.40
MTA New York Bus	$5.48
Pittsburgh	$5.62
Houston	$5.70
New Jersey	$5.99
Oakland	$7.04
Dallas	$7.31
Santa Clara	$7.50

Operating cost per boarding: This ratio is a cost-effectiveness measure that gauges how economically Metro provides its core service—getting passengers to their destinations.

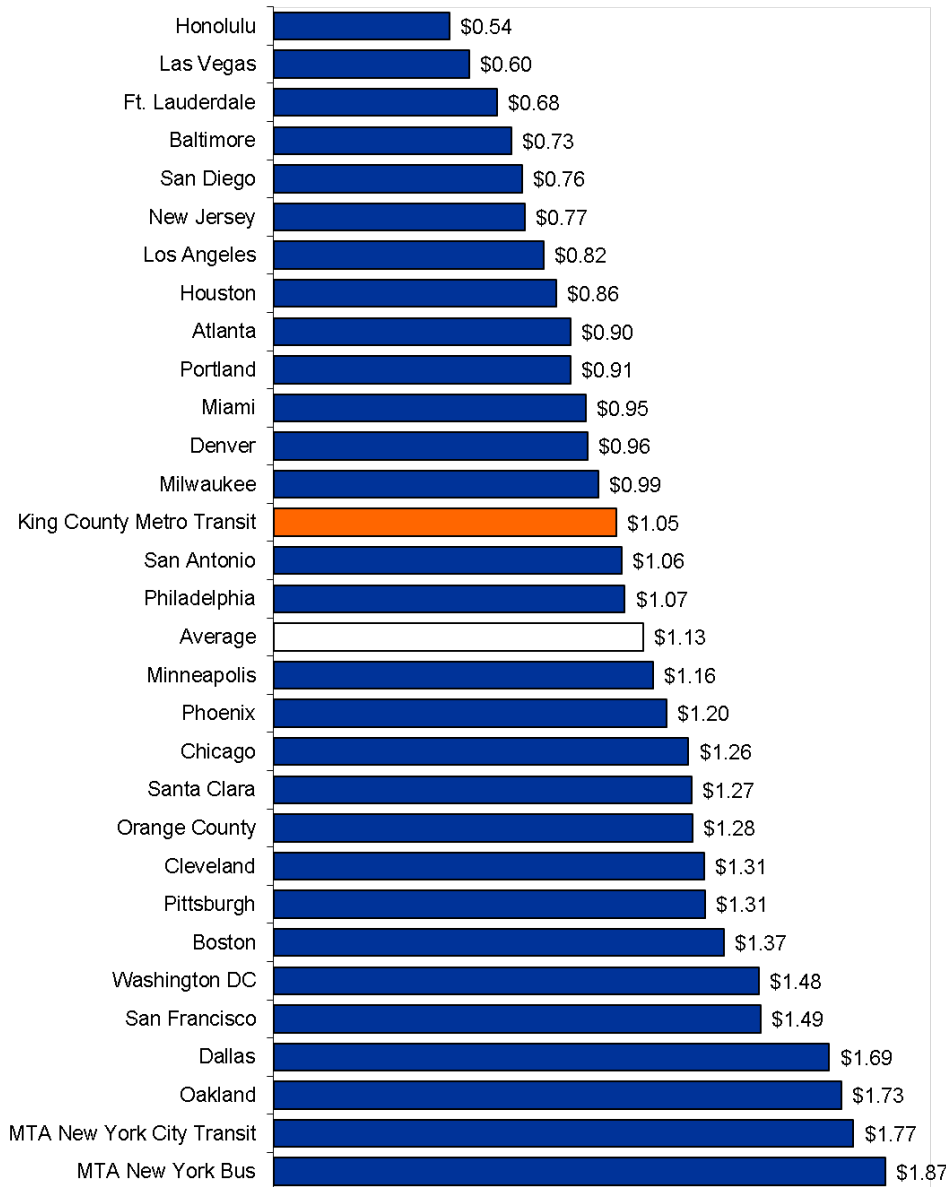**2016 peer rank:** Metro's cost per boading was $4.49 in 2016 (peer rank: 18th lowest). The peer average was $4.47.

Many of the issues that make Metro's cost high on a per-hour and per-mile basis also drive Metro's cost per boarding. But Metro's high number of boardings per hour enables the agency to be close to the peer average.

Trends: Cost per boarding increased by 5% in 2016. While cost per hour declined, many service hours were added to the system. And as noted earlier, ridership growth was flat. Metro expects the new service will result in ridership growth over time. Over the past five and 10 years, Metro's increase in cost per boarding was among the best of the peers, as ridership growth and cost containment slowed the increases in this ratio.

Annual Change	Metro	Rank[8]	Peer Avg.
1-year trend	5.0%	12	7.7%
5-year trend	1.9%	7	3.6%
10-year trend	2.1%	4	4.0%

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[8] A lower-numbered rank means a lower increase in the cost ratio, so a lower number is better; first is the best rank.

Operating Cost Per Passenger Mile
2016

City	Cost
Honolulu	$0.54
Las Vegas	$0.60
Ft. Lauderdale	$0.68
Baltimore	$0.73
San Diego	$0.76
New Jersey	$0.77
Los Angeles	$0.82
Houston	$0.86
Atlanta	$0.90
Portland	$0.91
Miami	$0.95
Denver	$0.96
Milwaukee	$0.99
King County Metro Transit	$1.05
San Antonio	$1.06
Philadelphia	$1.07
Average	$1.13
Minneapolis	$1.16
Phoenix	$1.20
Chicago	$1.26
Santa Clara	$1.27
Orange County	$1.28
Cleveland	$1.31
Pittsburgh	$1.31
Boston	$1.37
Washington DC	$1.48
San Francisco	$1.49
Dallas	$1.69
Oakland	$1.73
MTA New York City Transit	$1.77
MTA New York Bus	$1.87

Operating cost per passenger mile: This ratio is another cost-effectiveness measure. One could argue that cost per passenger mile is the most important cost ratio. A transit agency's core business is to move passengers over distances.

2016 peer rank: Metro's cost per passenger mile was $1.05 in 2016 (peer rank: 14th lowest). The peer average was $1.13.

The high number of passenger miles per vehicle mile enables Metro to be below the peer average in this cost ratio. Investments that raise the cost per hour, such as articulated coaches and the downtown transit tunnel, also help drive down the cost per passenger mile.
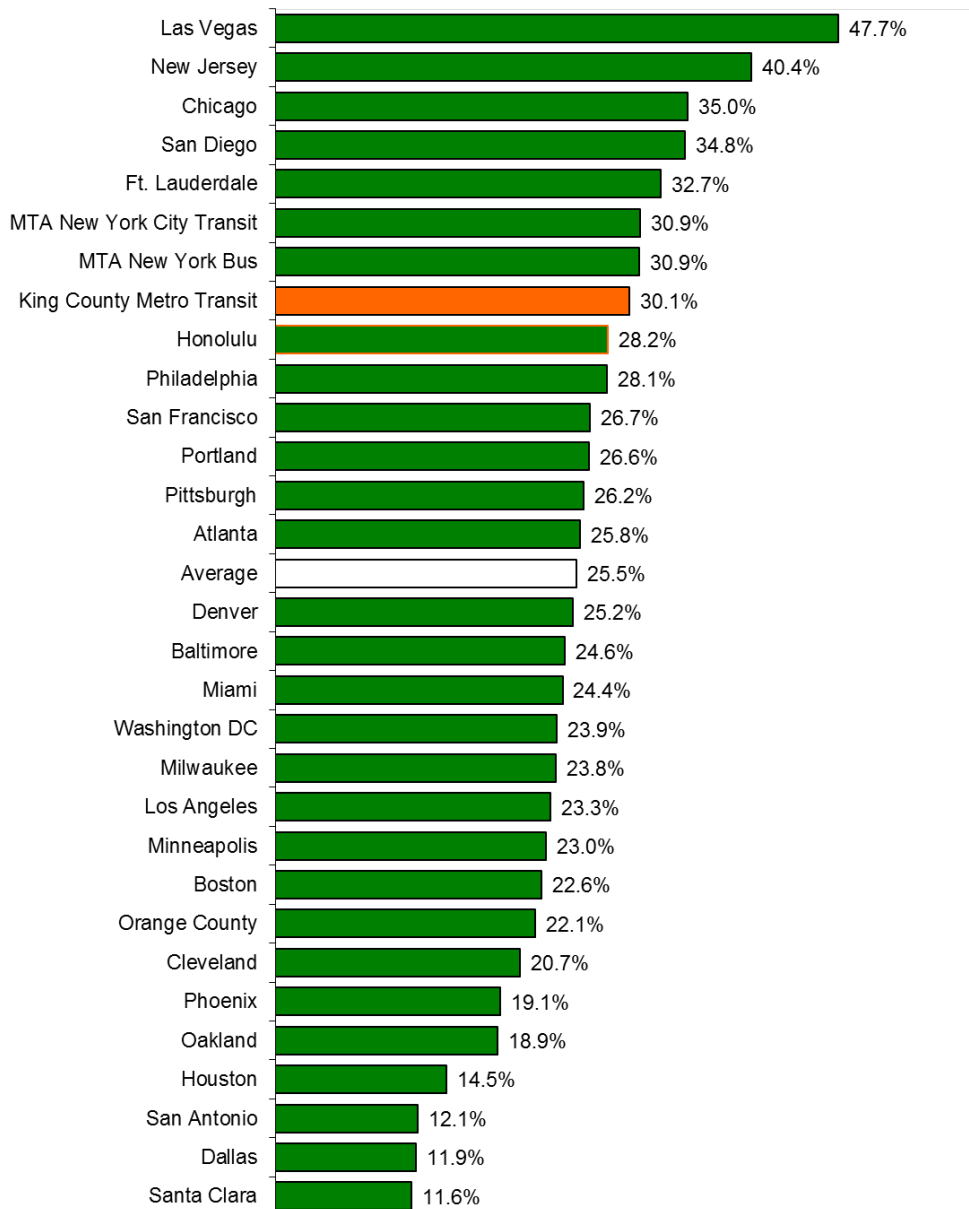
Trends: Metro's cost per passenger mile increased 7.9% in 2016. As noted earlier, cost per hour declined but many service hours were added to the system, ridership was flat, and passenger miles declined. Metro expects the new service will result in ridership and passenger-mile growth over time.

Annual Change	Metro	Rank[9]	Peer Avg.
1-year trend	7.9%	22	6.0%
5-year trend	1.9%	12	2.5%
10-year trend	2.9%	16	3.2%

Over the past five and 10 years, the increase in cost per passenger mile was slightly lower than the peer average. This was driven by Metro's above-average growth in total passenger miles.

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[9] A lower-numbered rank means a lower increase in the cost ratio, so a lower number is better; first is the best rank.

Farebox Recovery 2016

City	Percentage
Las Vegas	47.7%
New Jersey	40.4%
Chicago	35.0%
San Diego	34.8%
Ft. Lauderdale	32.7%
MTA New York City Transit	30.9%
MTA New York Bus	30.9%
King County Metro Transit	30.1%
Honolulu	28.2%
Philadelphia	28.1%
San Francisco	26.7%
Portland	26.6%
Pittsburgh	26.2%
Atlanta	25.8%
Average	25.5%
Denver	25.2%
Baltimore	24.6%
Miami	24.4%
Washington DC	23.9%
Milwaukee	23.8%
Los Angeles	23.3%
Minneapolis	23.0%
Boston	22.6%
Orange County	22.1%
Cleveland	20.7%
Phoenix	19.1%
Oakland	18.9%
Houston	14.5%
San Antonio	12.1%
Dallas	11.9%
Santa Clara	11.6%

Farebox recovery: This is the ratio of bus fare revenue (passes, cash, E-purse, and tickets) to bus operating cost. A higher ratio means less contribution from other sources, mainly sales taxes.

2016 peer rank: Metro's farebox recovery ratio was 30.1% in 2016 (peer rank: 8th). The peer average was 25.5%.

Trends: Metro saw a decline in farebox revenue in 2016 (down 0.7 percentage points). Ridership was flat, total costs increased as the result of new service hour investments, and a growing number of rides were taken by customers using the reduced-fare ORCA LIFT fare card for people with low incomes.

The trend in farebox recovery has been more positive in the longer term. Metro's primary funding source, sales tax revenue, fell as a result of the Great Recession, and took a number of years to recover. To replace a portion of the lost sales tax revenue, Metro raised fares each year from 2009 through 2011, and again in 2015. These past fare increases, along with increased ridership and the containment of operating costs, drove an increase in farebox recovery. Metro's increase in the 10-year span was the second highest among the peers. (A fare adjustment is planned for 2018. This will create a flat adult fare of $2.75 instead of the current $2.50, $2.75, and $3.25 zone- and peak-fare structure. This will increase revenue slightly.)

Total Change[10]	Metro	Rank	Peer Avg.
1-year trend	-0.7%	8	-1.6%
5-year trend	1.9%	4	-2.5%
10-year trend	9.7%	2	-2.6%

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[10] This measure is shown as total changes in percentage points. For instance, Metro's farebox recovery went from 20.4% in 2006 to 30.1% in 2016, a 9.7 percentage-point gain.