

# Performance Measure Summary - Seattle WA

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2017. There is no single performance measure that experts agree "says it all". A few key points should be recognized by users of the Urban Mobility Scorecard data.

**Use the trends** - The multi-year performance measures are better indicators, in most cases, than any single year. Examining a few measures over many years reduces the chance that data variations or the estimating procedures may have caused a "spike" in any single year. (5 years is 5 times better than 1 year.)

**Use several measures** - Each performance measure illustrates a different element of congestion. (The view is more interesting from atop several measures.)

**Compare to similar regions** - Congestion analyses that compare areas with similar characteristics (for example, population, growth rate, road and public transportation system design) are usually more insightful than comparisons of different regions. (Los Angeles is not Peoria.)

**Compare ranking changes and performance measure values** - In some performance measures, a small change in the value may cause a significant change in rank from one year to the next. This is the case when there are several regions with nearly the same value. (15 hours is only 1 hour more than 14 hours.)

**Consider the scope of improvement options** - Any improvement project in a corridor within most of the regions will only have a modest effect on the regional congestion level. (To have an effect on areawide congestion, there must be significant change in the system or service.)

## Performance Measures and Definition of Terms

**Travel Time Index** - A measure of congestion that focuses on each trip and each mile of travel. It is calculated as the ratio of travel time in the peak period to travel time in free-flow. A value of 1.30 indicates that a 20-minute free-flow trip takes 26 minutes in the peak.

**Planning Time Index** - A travel time reliability measure that represents the total travel time that should be planned for a trip. Computed with the 95th percentile travel time it represents the amount of time that should be planned for a commute trip to be late for only 1 day a month. If it is computed with the 80th percentile travel time it represents the amount of time that should be planned for a trip to be late for only 1 day a week. A PTI of 2.00 means that for a 20-minute trip in light traffic, 40 minutes should be planned.

**Peak Commuters** - Number of travelers who begin a trip during the morning or evening peak travel periods (6 to 10 a.m. and 3 to 7 p.m.). "Commuters" are private vehicle users unless specifically noted.

**Annual Delay per Commuter** - A yearly sum of all the per-trip delays for those persons who travel in the peak period (6 to 10 a.m. and 3 to 7 p.m.). This measure illustrates the effect of traffic slowdowns as well as the length of each trip.

**Total Delay** - The overall size of the congestion problem. Measured by the total travel time above that needed to complete a trip at free-flow speeds. The ranking of total delay usually follows the population ranking (larger regions usually have more delay).

**Free-Flow Speeds** - These values are derived from time periods with lighter traffic volumes in the INRIX speed database. They are used as the national comparison thresholds. Other speed thresholds may be appropriate for urban project evaluations or sub-region studies.

**Excess Fuel Consumed** - Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

**Congestion Cost** - Value of travel delay for 2017 (estimated at \$18.29 per hour of person travel and \$59.94 per hour of truck time) and excess fuel consumption estimated using state average cost per gallon.

**Urban Area** - The developed area (population density more than 1,000 persons per square mile) within a metropolitan region. The urban area boundaries change frequently (every year for most growing areas), so increases include both new growth and development that was previously in areas designated as rural.

**Number of Rush Hours** - Time when the road system might have congestion.

# Mobility Data for Seattle WA

Inventory Measures	2017	2016	2015	2014	2013	2012
<b>Urban Area Information</b>						
Population (1000s)	3,400	3,375	3,350	3,325	3,310	3,260
Rank	14	14	14	14	14	14
Commuters (1000s)	1,543	1,526	1,513	1,501	1,494	1,471
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	30,675	30,341	29,824	28,953	28,553	30,745
Arterial Streets	27,622	27,559	27,147	26,626	28,187	27,695
<b>Cost Components</b>						
Value of Time (\$/hour)	18.12	17.91	17.69	17.67	17.39	17.14
Commercial Cost (\$/hour)	52.14	50.20	46.87	44.82	41.23	39.66
Gasoline (\$/gallon)	2.83	2.56	2.71	3.54	3.74	3.68
Diesel (\$/gallon)	2.84	2.58	2.77	3.77	4.02	4.11
System Performance	2017	2016	2015	2014	2013	2012
<b>Congested Travel (% of peak VMT)</b>	37.1	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	23.3	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	5.0	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	62,742	62,564	62,250	62,050	61,809	59,583
Rank	14	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	31	30	29	28	29	28
Rank	7	9	10	11	6	10
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	167,384	164,744	162,517	159,201	155,800	148,850
Rank	12	12	12	12	12	13
Delay per Auto Commuter (pers-hrs)	78	76	74	72	71	69
Rank	7	7	7	6	6	6
<b>Travel Time Index</b>						
Rank	1.37	1.37	1.37	1.38	1.38	1.37
Rank	5	5	5	5	5	5
<b>Commuter Stress Index</b>						
Rank	1.44	--	--	--	--	--
Rank	8	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	2.28	--	--	--	--	--
Rank	7	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	3,405	3,292	3,204	3,180	3,067	2,886
Rank	12	12	12	12	12	13
Cost per Auto Commuter (\$)	1,541	1,527	1,498	1,459	1,443	1,396
Rank	9	9	7	7	7	6
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	7,030	6,919	6,826	6,686	6,544	6,252
Rank	12	12	12	12	12	13
Annual Gallons of Wasted Fuel (000)	13,301	13,264	13,197	13,155	13,103	12,632
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	359	339	317	312	289	269
Rank	12	12	12	12	12	13

\* Note: Zeroes in the table reflect values less than 0.5.

# Mobility Data for Seattle WA

Inventory Measures	2011	2010	2009	2008	2007	2006
<b>Urban Area Information</b>						
Population (1000s)	3,220	3,200	3,185	3,140	3,100	3,050
Rank	14	14	14	14	14	14
Commuters (1000s)	1,451	1,437	1,412	1,387	1,367	1,342
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	33,207	32,197	29,645	30,250	30,670	30,500
Arterial Streets	27,828	27,413	27,000	26,600	27,130	27,100
<b>Cost Components</b>						
Value of Time (\$/hour)	16.79	16.28	16.01	16.07	15.47	15.06
Commercial Cost (\$/hour)	44.62	42.50	41.83	40.77	39.30	37.88
Gasoline (\$/gallon)	3.60	2.95	2.51	3.60	3.18	2.80
Diesel (\$/gallon)	3.96	3.24	2.73	4.38	3.39	2.62
System Performance	2011	2010	2009	2008	2007	2006
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	58,247	56,894	55,071	56,200	55,817	54,832
Rank	14	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	27	27	24	25	25	26
Rank	8	6	8	7	9	7
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	141,578	137,010	130,140	126,484	125,622	123,405
Rank	13	13	13	14	14	14
Delay per Auto Commuter (pers-hrs)	66	64	62	62	62	62
Rank	7	6	5	5	6	6
<b>Travel Time Index</b>						
Rank	1.37	1.36	1.36	1.37	1.37	1.37
Rank	4	4	4	4	4	4
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	2,724	2,523	2,337	2,349	2,224	2,104
Rank	13	13	13	14	14	14
Cost per Auto Commuter (\$)	1,370	1,367	1,321	1,273	1,313	1,325
Rank	8	7	8	8	9	9
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	5,946	5,754	5,466	5,312	5,276	5,183
Rank	13	13	13	14	14	14
Annual Gallons of Wasted Fuel (000)	12,348	12,062	11,675	11,914	11,833	11,624
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	282	254	232	242	222	203
Rank	13	13	13	14	14	14

\* Note: Zeroes in the table reflect values less than 0.5.

# Mobility Data for Seattle WA

Inventory Measures	2005	2004	2003	2002	2001	2000
<b>Urban Area Information</b>						
Population (1000s)	3,005	2,965	2,900	2,810	2,740	2,685
Rank	14	14	14	15	15	15
Commuters (1000s)	1,315	1,293	1,260	1,203	1,153	1,112
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	30,800	30,500	30,650	30,500	30,000	29,400
Arterial Streets	26,200	25,800	23,600	24,100	23,750	23,420
<b>Cost Components</b>						
Value of Time (\$/hour)	14.58	14.10	13.73	13.43	13.22	12.85
Commercial Cost (\$/hour)	36.51	35.19	33.92	32.69	31.51	30.38
Gasoline (\$/gallon)	2.32	2.11	1.63	1.48	1.63	1.63
Diesel (\$/gallon)	2.83	2.22	1.66	1.43	1.66	1.60
System Performance	2005	2004	2003	2002	2001	2000
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	53,424	52,245	49,916	46,569	43,941	41,289
Rank	14	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	25	25	25	22	21	20
Rank	8	8	8	10	9	10
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	120,237	117,584	112,341	104,808	98,894	92,925
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	62	61	60	58	57	55
Rank	6	6	6	6	6	6
<b>Travel Time Index</b>						
Rank	1.37	1.37	1.36	1.35	1.34	1.33
Rank	3	3	3	3	3	3
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	1,971	1,852	1,700	1,543	1,439	1,315
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	1,336	1,351	1,326	1,263	1,209	1,167
Rank	9	9	9	11	11	11
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	5,050	4,939	4,718	4,402	4,154	3,903
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	11,326	11,076	10,582	9,873	9,316	8,753
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	194	177	158	140	130	118
Rank	13	13	13	13	13	13

\* Note: Zeroes in the table reflect values less than 0.5.

# Mobility Data for Seattle WA

Inventory Measures	1999	1998	1997	1996	1995	1994
<b>Urban Area Information</b>						
Population (1000s)	2,655	2,625	2,590	2,570	2,535	2,490
Rank	15	14	14	13	14	14
Commuters (1000s)	1,081	1,052	1,021	996	968	935
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	29,380	28,555	27,900	27,005	26,365	26,075
Arterial Streets	23,145	22,930	22,475	22,080	21,430	20,600
<b>Cost Components</b>						
Value of Time (\$/hour)	12.43	12.17	11.98	11.71	11.37	11.06
Commercial Cost (\$/hour)	29.28	28.89	28.50	28.12	27.75	27.38
Gasoline (\$/gallon)	1.40	1.13	1.33	1.35	1.25	1.16
Diesel (\$/gallon)	1.33	1.21	1.39	1.39	1.28	1.20
System Performance	1999	1998	1997	1996	1995	1994
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	39,324	37,537	35,600	33,719	32,027	30,804
Rank	14	13	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	19	18	17	16	15	15
Rank	9	10	9	10	11	9
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	88,503	84,480	80,121	75,888	72,080	69,328
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	54	53	51	50	48	48
Rank	6	6	6	6	6	5
<b>Travel Time Index</b>						
Rank	1.33	1.32	1.31	1.30	1.29	1.29
Rank	3	3	3	3	3	3
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	1,204	1,118	1,051	976	899	840
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	1,150	1,122	1,081	1,048	1,027	1,016
Rank	11	10	10	10	10	10
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	3,717	3,548	3,365	3,187	3,027	2,912
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	8,337	7,958	7,547	7,148	6,790	6,530
Rank	14	13	13	13	13	13
Annual Congestion Cost (\$ million)	107	100	95	89	82	78
Rank	13	13	13	13	13	13

\* Note: Zeroes in the table reflect values less than 0.5.

# Mobility Data for Seattle WA

Inventory Measures	1993	1992	1991	1990	1989	1988
<b>Urban Area Information</b>						
Population (1000s)	2,435	2,395	2,350	2,250	2,195	2,130
Rank	14	14	14	14	14	14
Commuters (1000s)	901	871	841	792	766	736
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	25,425	24,205	23,015	22,240	21,135	19,500
Arterial Streets	20,115	19,175	18,485	17,830	17,045	16,285
<b>Cost Components</b>						
Value of Time (\$/hour)	10.78	10.47	10.17	9.75	9.25	8.83
Commercial Cost (\$/hour)	27.02	26.66	26.30	25.95	25.60	25.26
Gasoline (\$/gallon)	1.19	1.22	1.14	1.09	1.10	1.02
Diesel (\$/gallon)	1.23	1.24	1.26	1.17	1.15	1.06
System Performance	1993	1992	1991	1990	1989	1988
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	29,251	27,789	25,822	23,852	22,617	20,976
Rank	13	13	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	14	14	13	12	11	10
Rank	10	8	9	9	9	11
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	65,832	62,542	58,116	53,681	50,902	47,208
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	47	46	44	43	42	41
Rank	4	4	5	5	5	4
<b>Travel Time Index</b>						
Rank	1.28	1.28	1.27	1.26	1.25	1.24
Rank	3	3	3	3	3	3
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	780	723	653	579	524	465
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	990	971	931	897	900	878
Rank	9	9	9	9	9	9
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	2,765	2,627	2,441	2,255	2,138	1,983
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	6,201	5,891	5,474	5,057	4,795	4,447
Rank	13	13	13	13	13	13
Annual Congestion Cost (\$ million)	73	69	63	57	54	49
Rank	13	13	13	13	13	13

\* Note: Zeroes in the table reflect values less than 0.5.

# Mobility Data for Seattle WA

Inventory Measures	1987	1986	1985	1984	1983	1982
<b>Urban Area Information</b>						
Population (1000s)	2,090	2,050	2,010	1,975	1,915	1,860
Rank	13	13	13	13	13	14
Commuters (1000s)	716	696	677	659	633	609
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	18,615	17,080	16,395	15,680	15,140	14,560
Arterial Streets	15,590	14,520	13,735	12,825	12,015	11,000
<b>Cost Components</b>						
Value of Time (\$/hour)	8.48	8.18	8.03	7.75	7.43	7.20
Commercial Cost (\$/hour)	24.93	24.60	24.27	23.94	23.63	23.31
Gasoline (\$/gallon)	1.02	0.99	1.30	1.31	1.34	1.41
Diesel (\$/gallon)	1.60	1.04	1.36	1.37	1.40	1.47
System Performance	1987	1986	1985	1984	1983	1982
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	19,516	18,386	17,191	16,140	15,400	14,010
Rank	13	12	12	12	12	12
Fuel per Peak Auto Commuter (gallons)	10	9	9	7	8	6
Rank	10	11	10	12	10	10
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	43,922	41,380	38,690	36,324	34,659	31,531
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	39	37	36	35	34	32
Rank	7	8	8	7	7	8
<b>Travel Time Index</b>						
Rank	1.23	1.23	1.22	1.21	1.21	1.19
Rank	3	4	4	4	4	4
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	419	380	355	323	298	264
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	852	833	794	773	770	727
Rank	11	10	10	11	10	10
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	1,845	1,738	1,625	1,526	1,456	1,324
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	4,137	3,898	3,644	3,422	3,265	2,970
Rank	13	12	12	12	12	12
Annual Congestion Cost (\$ million)	47	42	40	37	35	31
Rank	13	13	13	13	12	12

\* Note: Zeroes in the table reflect values less than 0.5.