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 2020. 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 2020 (estimated at \$20.17 per hour of person travel and \$55.24 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.

Annual Greenhouse Gases (CO2) Produced -Tons of CO2 produced from all vehicle travel.

Excess Greenhouse Gases (CO2) Produced due to Congestion-Tons of CO2 produced due to congested portion of travel. The excess CO2 is a subset of the total CO2 produced.

Inventory Measures	2020	2019	2018	2017	2016	2015
Urban Area Information						
Population (1000s)	3,500	3,500	3,450	3,400	3,375	3,350
Rank	14	14	14	14	14	14
Commuters (1000s)	1,588	1,588	1,566	1,543	1,526	1,513
Daily Vehicle-Miles of Travel (1000s)						
Freeway	24,062	30,928	31,058	30,675	30,341	29,824
Arterial Streets	21,698	27,890	27,767	27,622	27,559	27,147
Cost Components						
Value of Time (\$/hour)	20.17	19.14	18.71	18.12	17.91	17.69
Commercial Cost (\$/hour)	55.24	49.49	54.71	52.14	50.20	46.87
Gasoline (\$/gallon)	3.08	3.21	3.47	2.83	2.56	2.71
Diesel (\$/gallon)	3.23	3.26	3.43	2.84	2.58	2.77
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)				37.1		
Congested System (% of lane-miles)				23.3		
Congested Time (number of "Rush Hours")				5.0		
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	27,569	67,508	64,151	62,742	62,564	62,250
Rank	13	12	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	13	32	31	31	30	29
Rank	28	8	9	7	9	10
Annual Delay						
Total Delay (1000s of person-hours)	69,016	168,998	167,867	167,384	164,744	162,517
Rank	13	12	12	12	12	12
Delay per Auto Commuter (pers-hrs)	31	77	77	78	76	74
Rank	24	8	8	7	7	7
Travel Time Index	1.11	1.37	1.37	1.37	1.37	1.37
Rank	20	5	5	5	5	5
Commuter Stress Index	1.12	1.43	1.44	1.44		
Rank	24	12	6	8		
Freeway Planning Time Index (95th Pctile)		2.19	2.14	2.28		
Rank		5	6	7		
Congestion Cost						
Total Cost (\$ millions)	1,556	3,664	3,672	3,589	3,472	3,380
Rank	13	13	12	12	12	12
Cost per Auto Commuter (\$)	685	1,612	1,639	1,625	1,611	1,580
Rank	22	10	10	9	9	7
Truck Congestion						
Annual Person-Hours of Delay (000)	2,773	6,966	6,878	6,930	6,919	6,826
Rank	15	13	13	13	11	11
Annual Gallons of Wasted Fuel (000)	4,366	10,968	10,789	10,701	10,671	10,617
Rank	16	14	14	14	14	14
Annual Congestion Cost (\$ million)	148	342	378	366	350	327
Rank	15	13	14	14	12	12
Annual Greenhouse Gases (CO2) Produced	275.26	(71.25			ı	
Excess Due to Congestion (tons)	275,361	674,271				
Rank	13	11 225 204				
Due to All Travel (tons)	4,588,506	11,235,804				
Rank	19	14				
Truck Annual Greenhouse Gases (CO2) Produced	00.000	202 412			ı	
Excess Due to Truck Congestion (tons)	80,980	203,413				
Rank	11	8				
Due to Truck Travel (tons)	801,205	2,012,554				
Rank	32	20				

^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	3,325	3,310	3,260	3,220	3,200	3,185
Rank	14	14	14	14	14	14
Commuters (1000s)	1,501	1,494	1,471	1,451	1,437	1,412
Daily Vehicle-Miles of Travel (1000s)						
Freeway	28,953	28,553	30,745	33,207	32,197	29,645
Arterial Streets	26,626	28,187	27,695	27,828	27,413	27,000
Cost Components						
Value of Time (\$/hour)	17.67	17.39	17.14	16.79	16.28	16.01
Commercial Cost (\$/hour)	44.82	41.23	39.66	44.62	42.50	41.83
Gasoline (\$/gallon)	3.54	3.74	3.68	3.60	2.95	2.51
Diesel (\$/gallon)	3.77	4.02	4.11	3.96	3.24	2.73
System Performance	2014	2013	2012	2011	2010	2009
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	62,050	61,809	59,583	58,247	56,894	55,071
Rank	14	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	28	29	28	27	27	24
Rank	11	6	10	8	6	8
Annual Delay						
Total Delay (1000s of person-hours)	159,201	155,800	148,850	141,578	137,010	130,140
Rank	12	12	13	13	13	13
Delay per Auto Commuter (pers-hrs)	72	71	69	66	64	62
Rank	6	6	6	7	6	5
Travel Time Index	1.38	1.38	1.37	1.37	1.36	1.36
Rank	5	5	5	4	4	4
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	3,354	3,234	3,043	2,873	2,660	2,465
Rank	12	12	13	13	13	13
Cost per Auto Commuter (\$)	1,539	1,522	1,473	1,445	1,442	1,393
Rank	7	7	6	8	7	8
Truck Congestion						
Annual Person-Hours of Delay (000)	6,686	6,544	6,252	5,946	5,754	5,466
Rank	10	10	13	13	13	13
Annual Gallons of Wasted Fuel (000)	10,584	10,542	10,163	9,934	9,704	9,393
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	319	294	273	287	259	239
Rank	12	12	14	14	14	14
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)						
Rank						
Due to Truck Travel (tons)						
Rank						

^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2008	2007	2006	2005	2004	2003
Urban Area Information						
Population (1000s)	3,140	3,100	3,050	3,005	2,965	2,900
Rank	14	14	14	14	14	14
Commuters (1000s)	1,387	1,367	1,342	1,315	1,293	1,260
Daily Vehicle-Miles of Travel (1000s)						
Freeway	30,250	30,670	30,500	30,800	30,500	30,650
Arterial Streets	26,600	27,130	27,100	26,200	25,800	23,600
Cost Components						
Value of Time (\$/hour)	16.07	15.47	15.06	14.58	14.10	13.73
Commercial Cost (\$/hour)	40.77	39.30	37.88	36.51	35.19	33.92
Gasoline (\$/gallon)	3.60	3.18	2.80	2.32	2.11	1.63
Diesel (\$/gallon)	4.38	3.39	2.62	2.83	2.22	1.66
System Performance	2008	2007	2006	2005	2004	2003
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	56,200	55,817	54,832	53,424	52,245	49,916
Rank	14	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	25	25	26	25	25	25
Rank	7	9	7	8	8	8
Annual Delay						
Total Delay (1000s of person-hours)	126,484	125,622	123,405	120,237	117,584	112,341
Rank	14	14	14	13	13	13
Delay per Auto Commuter (pers-hrs)	62	62	62	62	61	60
Rank	5	6	6	6	6	6
Travel Time Index	1.37	1.37	1.37	1.37	1.37	1.36
Rank	4	4	4	3	3	3
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	2,476	2,345	2,220	2,078	1,954	1,793
Rank	14	14	14	13	13	13
Cost per Auto Commuter (\$)	1,343	1,385	1,398	1,409	1,425	1,399
Rank	8	9	9	9	9	9
Truck Congestion						
Annual Person-Hours of Delay (000)	5,312	5,276	5,183	5,050	4,939	4,718
Rank	14	14	14	13	13	13
Annual Gallons of Wasted Fuel (000)	9,585	9,520	9,352	9,112	8,911	8,513
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	245	226	208	198	182	163
Rank	14	14	14	14	13	13
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)						
Rank						
Due to Truck Travel (tons)						
Rank			'			

^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2002	2001	2000	1999	1998	1997
Urban Area Information						
Population (1000s)	2,810	2,740	2,685	2,655	2,625	2,590
Rank	15	15	15	15	14	14
Commuters (1000s)	1,203	1,153	1,112	1,081	1,052	1,021
Daily Vehicle-Miles of Travel (1000s)						
Freeway	30,500	30,000	29,400	29,380	28,555	27,900
Arterial Streets	24,100	23,750	23,420	23,145	22,930	22,475
Cost Components						
Value of Time (\$/hour)	13.43	13.22	12.85	12.43	12.17	11.98
Commercial Cost (\$/hour)	32.69	31.51	30.38	29.28	28.89	28.50
Gasoline (\$/gallon)	1.48	1.63	1.63	1.40	1.13	1.33
Diesel (\$/gallon)	1.43	1.66	1.60	1.33	1.21	1.39
System Performance	2002	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	46,569	43,941	41,289	39,324	37,537	35,600
Rank	14	14	14	14	13	13
Fuel per Peak Auto Commuter (gallons)	22	21	20	19	18	17
Rank	10	9	10	9	10	9
Annual Delay						
Total Delay (1000s of person-hours)	104,808	98,894	92,925	88,503	84,480	80,121
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	58	57	55	54	53	51
Rank	6	6	6	6	6	6
Travel Time Index	1.35	1.34	1.33	1.33	1.32	1.31
Rank	3	3	3	3	3	3
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	1,628	1,518	1,387	1,270	1,179	1,109
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	1,332	1,275	1,231	1,213	1,184	1,140
Rank	11	11	11	11	10	10
Truck Congestion						
Annual Person-Hours of Delay (000)	4,402	4,154	3,903	3,717	3,548	3,365
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	7,943	7,495	7,042	6,707	6,402	6,072
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	145	134	122	110	103	98
Rank	13	13	13	13	13	13
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					1	
Excess Due to Truck Congestion (tons)						
Rank						
Due to Truck Travel (tons)						
Rank						

^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1996	1995	1994	1993	1992	1991
Urban Area Information						
Population (1000s)	2,570	2,535	2,490	2,435	2,395	2,350
Rank	13	14	14	14	14	14
Commuters (1000s)	996	968	935	901	871	841
Daily Vehicle-Miles of Travel (1000s)						
Freeway	27,005	26,365	26,075	25,425	24,205	23,015
Arterial Streets	22,080	21,430	20,600	20,115	19,175	18,485
Cost Components						
Value of Time (\$/hour)	11.71	11.37	11.06	10.78	10.47	10.17
Commercial Cost (\$/hour)	28.12	27.75	27.38	27.02	26.66	26.30
Gasoline (\$/gallon)	1.35	1.25	1.16	1.19	1.22	1.14
Diesel (\$/gallon)	1.39	1.28	1.20	1.23	1.24	1.26
System Performance	1996	1995	1994	1993	1992	1991
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	33,719	32,027	30,804	29,251	27,789	25,822
Rank	13	13	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	16	15	15	14	14	13
Rank	10	11	9	10	8	9
Annual Delay						
Total Delay (1000s of person-hours)	75,888	72,080	69,328	65,832	62,542	58,116
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	50	48	48	47	46	44
Rank	6	6	5	4	4	5
Travel Time Index	1.30	1.29	1.29	1.28	1.28	1.27
Rank	3	3	3	3	3	3
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	1,029	948	887	823	762	688
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	1,105	1,083	1,072	1,044	1,024	982
Rank	10	10	10	9	9	9
Truck Congestion						
Annual Person-Hours of Delay (000)	3,187	3,027	2,912	2,765	2,627	2,441
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	5,751	5,463	5,254	4,989	4,739	4,404
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	91	85	80	76	71	65
Rank	13	13	13	13	13	13
Annual Greenhouse Gases (CO2) Produced				ı	1	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					1	
Excess Due to Truck Congestion (tons)						
Rank						
Due to Truck Travel (tons)						
Rank						

^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1990	1989	1988	1987	1986	1985
Urban Area Information						
Population (1000s)	2,250	2,195	2,130	2,090	2,050	2,010
Rank	14	14	14	13	13	13
Commuters (1000s)	792	766	736	716	696	677
Daily Vehicle-Miles of Travel (1000s)						
Freeway	22,240	21,135	19,500	18,615	17,080	16,395
Arterial Streets	17,830	17,045	16,285	15,590	14,520	13,735
Cost Components						
Value of Time (\$/hour)	9.75	9.25	8.83	8.48	8.18	8.03
Commercial Cost (\$/hour)	25.95	25.60	25.26	24.93	24.60	24.27
Gasoline (\$/gallon)	1.09	1.10	1.02	1.02	0.99	1.30
Diesel (\$/gallon)	1.17	1.15	1.06	1.60	1.04	1.36
System Performance	1990	1989	1988	1987	1986	1985
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	23,852	22,617	20,976	19,516	18,386	17,191
Rank	13	13	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	12	11	10	10	9	9
Rank	9	9	11	10	11	10
Annual Delay						
Total Delay (1000s of person-hours)	53,681	50,902	47,208	43,922	41,380	38,690
Rank	13	13	13	13	13	13
Delay per Auto Commuter (pers-hrs)	43	42	41	39	37	36
Rank	5	5	4	7	8	8
Travel Time Index	1.26	1.25	1.24	1.23	1.23	1.22
Rank	3	3	3	3	4	4
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	611	553	490	442	401	374
Rank	13	13	13	13	13	13
Cost per Auto Commuter (\$)	946	949	926	899	879	838
Rank	9	9	9	11	10	10
Truck Congestion			4		4	
Annual Person-Hours of Delay (000)	2,255	2,138	1,983	1,845	1,738	1,625
Rank	13	13	13	13	13	13
Annual Gallons of Wasted Fuel (000)	4,068	3,858	3,578	3,328	3,136	2,932
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million) Rank	59 13	55 13	50 13	48 13	43 13	41 13
	13	13	13	13	13	13
Annual Greenhouse Gases (CO2) Produced				ı	I	
Excess Due to Congestion (tons) Rank						
Nank Due to All Travel (tons)						
Rank				<u></u>		 -
Truck Annual Greenhouse Gases (CO2) Produced				ı	I	
Excess Due to Truck Congestion (tons) Rank						
Rank Due to Truck Travel (tons)						
Rank						
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^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	1,975	1,915	1,860
Rank	13	13	14
Commuters (1000s)	659	633	609
Daily Vehicle-Miles of Travel (1000s)			
Freeway	15,680	15,140	14,560
Arterial Streets	12,825	12,015	11,000
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.31	1.34	1.41
Diesel (\$/gallon)	1.37	1.40	1.47
System Performance	1984	1983	1982
Congested Travel (% of peak VMT)			
Congested System (% of lane-miles)			
Congested Time (number of "Rush Hours")			
Annual Excess Fuel Consumed			
Total Fuel (1000 gallons)	16,140	15,400	14,010
Rank	13	13	13
Fuel per Peak Auto Commuter (gallons)	7	8	6
Rank	12	10	10
Annual Delay			
Total Delay (1000s of person-hours)	36,324	34,659	31,531
Rank	12	12	12
Delay per Auto Commuter (pers-hrs)	35	34	32
Rank	7	7	8
Travel Time Index	1.21	1.21	1.19
Rank	4	4	4
Commuter Stress Index		· 	
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	341	314	279
Rank	13	12	12
Cost per Auto Commuter (\$)	815	812	767
Rank	11	10	10
Truck Congestion			
Annual Person-Hours of Delay (000)	1,526	1,456	1,324
Rank	13	13	13
Annual Gallons of Wasted Fuel (000)	2,753	2,627	2,389
Rank	14	14	14
Annual Congestion Cost (\$ million)	38	36	32
Rank	13	12	13
Annual Greenhouse Gases (CO2) Produced			
Excess Due to Congestion (tons)			
· · ·			
Excess Due to Congestion (tons)	 	 	
Excess Due to Congestion (tons) Rank	 	 	
Excess Due to Congestion (tons) Rank Due to All Travel (tons) Rank	 	 	
Excess Due to Congestion (tons) Rank Due to All Travel (tons) Rank Truck Annual Greenhouse Gases (CO2) Produced	 	 	
Excess Due to Congestion (tons) Rank Due to All Travel (tons) Rank	 	 	
Excess Due to Congestion (tons) Rank Due to All Travel (tons) Rank Truck Annual Greenhouse Gases (CO2) Produced Excess Due to Truck Congestion (tons)	 	 	

^{*} Note: Zeroes in the table reflect values less than 0.5.