Performance Measure Summary - Allentown PA-NJ

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)	685	685	685	680	670	660
Rank	64	64	64	64	64	64
Commuters (1000s)	343	343	343	340	327	323
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,430	5,490	5,664	5,585	5,318	5,232
Arterial Streets	4,250	5,266	5,329	5,324	5,426	5,325
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)	2.57	2.81	3.06	2.57	2.32	2.44
Diesel (\$/gallon)	3.09	3.40	3.61	2.94	2.59	2.80
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)				14.3		
Congested System (% of lane-miles)				9.9		
Congested Time (number of "Rush Hours")				1.0		
Annual Excess Fuel Consumed				1.0		
Total Fuel (1000 gallons)	2,886	5,728	6,086	5,793	5,701	5,668
Rank	79	77	75	75	74	74
Fuel per Peak Auto Commuter (gallons)	8	16	17	16	16	16
Rank	82	81	74	77	76	73
Annual Delay	02	01	7 1	, ,	70	7.5
Total Delay (1000s of person-hours)	7,535	14,953	14,694	15,068	14,518	14,186
Rank	7,333	75	74	74	74	74
Delay per Auto Commuter (pers-hrs)	19	37	37	38	37	35
Rank	82	86	85	80	81	86
Travel Time Index	1.09	1.16	1.16	1.16	1.16	1.15
Rank	40	59	57	59	58	67
Commuter Stress Index	1.09	1.21	1.21	1.21	36	07
Rank	44	44	45	41		
Freeway Planning Time Index (95th Pctile)		1.25	1.24	1.27		
Rank		80	80	78		
Congestion Cost				70		
Total Cost (\$ millions)	169	321	320	320	303	293
Rank	77	76	74	74	74	74
Cost per Auto Commuter (\$)	360	686	682	689	667	649
Rank	90	92	90	86	87	86
Truck Congestion			, ,		0,	
Annual Person-Hours of Delay (000)	314	601	554	559	538	526
Rank	79	79	79	80	81	81
Annual Gallons of Wasted Fuel (000)	659	1,262	1,250	1,228	1,209	1,201
Rank	76	68	69	69	69	68
Annual Congestion Cost (\$ million)	17	31	32	31	28	26
Rank	78	78	78	79	80	78
Annual Greenhouse Gases (CO2) Produced	,,,	, ,	, , ,	,,,		, 3
Excess Due to Congestion (tons)	28,724	57,004				
Rank	80	77	 			
Due to All Travel (tons)	1,099,526	2,182,073	 			
Rank	75	75				
Truck Annual Greenhouse Gases (CO2) Produced	13	, , ,				
Excess Due to Truck Congestion (tons)	7,137	13,666				
Rank	7,137	70	 			
Due to Truck Travel (tons)	471,136	902,107	 			 -
Rank	57	49				
IXGIIK	37					

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

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	655	650	650	645	640	635
Rank	64	64	63	63	63	64
Commuters (1000s)	329	333	333	330	326	322
Daily Vehicle-Miles of Travel (1000s)	i					
Freeway	5,599	5,310	5,080	5,096	5,080	4,850
Arterial Streets	5,199	5,284	5,400	5,399	5,382	5,400
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)	3.36	3.52	3.55	3.41	2.78	2.33
Diesel (\$/gallon)	3.69	3.93	4.00	3.79	3.12	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)	5,627	5,575	5,532	5,488	5,427	5,221
Rank	74	74	74	74	74	73
Fuel per Peak Auto Commuter (gallons)	15	15	15	15	16	14
Rank	81	82	78	74	68	71
Annual Delay						
Total Delay (1000s of person-hours)	13,837	13,464	13,117	12,892	12,630	11,922
Rank	74	74	74	73	72	73
Delay per Auto Commuter (pers-hrs)	34	33	32	32	32	30
Rank	85	84	83	82	81	83
Travel Time Index	1.14	1.14	1.14	1.14	1.14	1.13
Rank	78	76	77	75	71	82
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	290	278	267	260	244	224
Rank	74	74	75	73	72	73
Cost per Auto Commuter (\$)	629	618	611	620	624	600
Rank	85	85	84	81	82	83
Truck Congestion						
Annual Person-Hours of Delay (000)	513	499	487	478	468	442
Rank	80	79	78	78	79	79
Annual Gallons of Wasted Fuel (000)	1,193	1,182	1,173	1,163	1,151	1,107
Rank	68	68	68	67	67	67
Annual Congestion Cost (\$ million)	26	24	23	24	22	20
Rank	77	77	76	76	76	76
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)	625	625	620	620	620	615
Rank	63	63	64	62	61	62
Commuters (1000s)	316	314	310	308	306	302
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,780	4,935	4,950	5,085	4,870	4,600
Arterial Streets	5,475	5,630	5,445	5,425	5,350	5,300
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)	3.42	2.87	2.68	2.28	1.94	1.51
Diesel (\$/gallon)	4.41	3.56	2.93	2.58	2.03	1.59
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)	5,345	5,556	5,531	5,528	5,461	5,409
Rank	75	74	73	71	71	71
Fuel per Peak Auto Commuter (gallons)	14	15	15	15	15	15
Rank	80	73	73	64	65	58
Annual Delay						
Total Delay (1000s of person-hours)	11,734	12,197	12,144	12,136	11,988	11,875
Rank	75	71	67	64	63	63
Delay per Auto Commuter (pers-hrs)	30	31	31	32	31	31
Rank	81	81	80	75	78	75
Travel Time Index	1.13	1.14	1.14	1.14	1.14	1.14
Rank	84	77	75	73	71	69
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	228	226	218	209	197	188
Rank	75	73	68	66	64	64
Cost per Auto Commuter (\$)	584	633	649	668	681	696
Rank	81	80	75	69	66	64
Truck Congestion						
Annual Person-Hours of Delay (000)	435	452	451	450	445	440
Rank	77	1 177	75	73	72	71
Annual Gallons of Wasted Fuel (000)	1,133	1,177	1,173	1,172	1,157	1,147
Rank	70	65	64	63	61	61
Annual Congestion Cost (\$ million)	22	21 75	19	18	17	16
Rank	76	/3	73	73	67	65
Annual Greenhouse Gases (CO2) Produced				1	I	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons) Rank						
Truck Annual Greenhouse Gases (CO2) Produced					I	
Excess Due to Truck Congestion (tons)						
Rank Due to Truck Travel (tons)						
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)	610	605	600	590	580	575
Rank	62	62	62	62	62	61
Commuters (1000s)	296	290	284	276	268	262
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,200	4,050	3,920	3,800	3,720	3,585
Arterial Streets	5,280	5,250	5,210	5,040	4,860	4,710
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)	1.36	1.54	1.51	1.11	1.06	1.19
Diesel (\$/gallon)	1.43	1.59	1.57	1.19	1.20	1.30
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)	5,582	5,560	5,579	5,305	5,160	5,067
Rank	64	60	59	58	57	57
Fuel per Peak Auto Commuter (gallons)	15	15	16	15	14	15
Rank	53	47	32	32	31	17
Annual Delay						
Total Delay (1000s of person-hours)	12,255	12,207	12,248	11,648	11,329	11,125
Rank	58	57	57	57	56	55
Delay per Auto Commuter (pers-hrs)	33	33	34	33	33	33
Rank	59	58	49	51	46	45
Travel Time Index	1.14	1.14	1.14	1.14	1.13	1.13
Rank	68	66	62	58	63	60
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	189	186	182	165	157	153
Rank	58	57	57	57	56	56
Cost per Auto Commuter (\$)	733	739	764	751	747	746
Rank	50	47	42	41	36	29
Truck Congestion						
Annual Person-Hours of Delay (000)	454	453	454	432	421	412
Rank	65	65	64	64	61	61
Annual Gallons of Wasted Fuel (000)	1,183	1,179	1,183	1,125	1,094	1,074
Rank	60	60	60	60	58	56
Annual Congestion Cost (\$ million)	16	15	15	13	13	12
Rank	64	64	60	61	60	60
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						
	1					
Due to Truck Travel (tons)						

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

550 62 244 3,255 4,335 11.37 27.75 1.19 1.32 1995 	540 62 237 3,100 4,210 11.06 27.38 1.04 1.15 1994 3,516 63	530 62 230 2,940 4,020 10.78 27.02 1.09 1.21 1993	525 62 225 2,670 3,800 10.47 26.66 1.14 1.28 1992	520 61 220 2,480 3,560 10.17 26.30 1.16 1.29
62 244 3,255 4,335 11.37 27.75 1.19 1.32 1995 4,049	3,100 4,210 11.06 27.38 1.04 1.15 1994 	62 230 2,940 4,020 10.78 27.02 1.09 1.21 1993	62 225 2,670 3,800 10.47 26.66 1.14 1.28 1992	2,480 3,560 10.17 26.30 1.16 1.29
62 244 3,255 4,335 11.37 27.75 1.19 1.32 1995 4,049	3,100 4,210 11.06 27.38 1.04 1.15 1994 	62 230 2,940 4,020 10.78 27.02 1.09 1.21 1993	62 225 2,670 3,800 10.47 26.66 1.14 1.28 1992	2,480 3,560 10.17 26.30 1.16 1.29
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4,335 11.37 27.75 1.19 1.32 1995 4,049	4,210 11.06 27.38 1.04 1.15 1994 3,516	4,020 10.78 27.02 1.09 1.21 1993 3,005	3,800 10.47 26.66 1.14 1.28 1992 2,634	3,560 10.17 26.30 1.16 1.29
4,335 11.37 27.75 1.19 1.32 1995 4,049	4,210 11.06 27.38 1.04 1.15 1994 3,516	4,020 10.78 27.02 1.09 1.21 1993 3,005	3,800 10.47 26.66 1.14 1.28 1992 2,634	3,560 10.17 26.30 1.16 1.29
11.37 27.75 1.19 1.32 1995 4,049	11.06 27.38 1.04 1.15 1994 3,516	10.78 27.02 1.09 1.21 1993 3,005	10.47 26.66 1.14 1.28 1992 2,634	10.17 26.30 1.16 1.29
27.75 1.19 1.32 1995 4,049	27.38 1.04 1.15 1994 3,516	27.02 1.09 1.21 1993 3,005	26.66 1.14 1.28 1992 2,634	26.30 1.16 1.29
27.75 1.19 1.32 1995 4,049	27.38 1.04 1.15 1994 3,516	27.02 1.09 1.21 1993 3,005	26.66 1.14 1.28 1992 2,634	26.30 1.16 1.29
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1.32 1995 4,049	1.15 1994 3,516	1.21 1993 3,005	1.28 1992 2,634	1.29
1995 4,049	1994 3,516	1993 3,005	1992 2,634	
4,049	 3,516	3,005	2,634	
4,049	3,516	3,005	2,634	
4,049	3,516	3,005	2,634	
4,049	3,516	3,005	2,634	
60	63	68		2,263
			68	69
13	12	9	8	6
19	21	49	53	67
8,889	7,719	6,599	5,782	4,968
59	62	65	66	66
28	25	22	20	17
52	61	68	67	78
1.12	1.10	1.10	1.09	1.07
57	69	64	67	80
116	98	82	70	59
58	62	65	66	67
626	562	494	443	391
43	46	57	63	68
330	286	245	214	184
	66	69	71	72
64	746	637	558	479
64 859	60	61	62	66
	8	7	6	5
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^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1990	1989	1988	1987	1986	1985
Urban Area Information						
Population (1000s)	505	500	490	485	475	465
Rank	62	62	62	63	64	62
Commuters (1000s)	210	207	201	197	192	187
Daily Vehicle-Miles of Travel (1000s)						
Freeway	2,430	2,310	2,225	2,100	1,980	1,865
Arterial Streets	3,450	3,375	3,315	3,260	3,205	3,100
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)	1.30	1.06	0.98	0.98	0.96	1.25
Diesel (\$/gallon)	1.08	1.03	0.95	0.95	0.93	1.22
System Performance	1990	1989	1988	1987	1986	1985
						1703
Congested Travel (% of Jone wiles)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	2,131	1,818	1,739	1,710	1,526	1,409
Rank	68	68	67	65	67	66
Fuel per Peak Auto Commuter (gallons)	7	5	5	6	4	4
Rank	50	63	58	32	54	50
Annual Delay						
Total Delay (1000s of person-hours)	4,679	3,991	3,817	3,756	3,350	3,094
Rank	66	67	67	65	65	64
Delay per Auto Commuter (pers-hrs)	17	14	14	14	13	12
Rank	70	80	75	64	64	63
Travel Time Index	1.06	1.06	1.06	1.06	1.06	1.06
Rank	85	79	73	65	56	53
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	53	43	39	37	32	30
Rank	66	67	67	65	65	64
Cost per Auto Commuter (\$)	387	349	351	361	339	313
Rank	65	69	65	59	61	60
Truck Congestion						
Annual Person-Hours of Delay (000)	174	148	141	139	124	115
Rank	70	72	70	67	69	69
Annual Gallons of Wasted Fuel (000)	452	385	369	363	323	299
Rank	64	67	65	61	63	60
Annual Congestion Cost (\$ million)	5	4	4	4	3	3
Rank	67	68	66	61	67	64
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)						

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

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	455	450	440
Rank	61	61	63
Commuters (1000s)	181	178	172
Daily Vehicle-Miles of Travel (1000s)			
Freeway	1,870	1,885	1,735
Arterial Streets	3,030	2,980	2,965
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.27	1.30	1.35
Diesel (\$/gallon)	1.23	1.26	1.32
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)	1,333	1,287	1.195
Rank	66	62	62
Fuel per Peak Auto Commuter (gallons)	4	4	3
Rank	41	35	34
Annual Delay			
Total Delay (1000s of person-hours)	2,926	2,826	2,624
Rank	63	62	60
Delay per Auto Commuter (pers-hrs)	12	12	11
Rank	56	51	53
Travel Time Index	1.06	1.06	1.06
Rank	50	45	42
Commuter Stress Index			7 <i>L</i>
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	27	25	23
Rank	63	62	60
Cost per Auto Commuter (\$)	312	316	297
Rank	55	48	49
Truck Congestion			
Annual Person-Hours of Delay (000)	108	105	97
Rank	69	66	66
Annual Gallons of Wasted Fuel (000)	282	273	253
Rank	60	58	57
Annual Congestion Cost (\$ million)	3	3	2
Rank	58	54	65
Annual Greenhouse Gases (CO2) Produced		- 1	
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			
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^{*} Note: Zeroes in the table reflect values less than 0.5.