

# 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 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 Allentown PA-NJ

Inventory Measures	2017	2016	2015	2014	2013	2012
<b>Urban Area Information</b>						
Population (1000s)	680	670	660	655	650	650
Rank	64	64	64	64	64	63
Commuters (1000s)	340	327	323	329	333	333
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	5,585	5,318	5,232	5,599	5,310	5,080
Arterial Streets	5,324	5,426	5,325	5,199	5,284	5,400
<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)	2.57	2.32	2.44	3.36	3.52	3.55
Diesel (\$/gallon)	2.94	2.59	2.80	3.69	3.93	4.00
System Performance	2017	2016	2015	2014	2013	2012
<b>Congested Travel (% of peak VMT)</b>	14.3	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	9.9	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	1.0	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	7,793	7,669	7,625	7,570	7,500	7,442
Rank	64	64	63	63	63	62
Fuel per Peak Auto Commuter (gallons)	16	16	16	15	15	15
Rank	77	76	73	81	82	78
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	18,068	17,408	17,010	16,592	16,145	15,728
Rank	65	67	67	67	66	65
Delay per Auto Commuter (pers-hrs)	38	37	35	34	33	32
Rank	80	81	86	85	84	83
<b>Travel Time Index</b>						
Rank	1.20	1.20	1.19	1.18	1.18	1.18
Rank	39	39	39	40	41	40
<b>Commuter Stress Index</b>						
Rank	1.21	--	--	--	--	--
Rank	41	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	1.27	--	--	--	--	--
Rank	78	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	369	349	337	334	321	308
Rank	65	66	66	66	65	65
Cost per Auto Commuter (\$)	653	632	615	596	586	579
Rank	86	87	86	85	85	84
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	759	731	714	697	678	661
Rank	65	67	67	67	66	65
Annual Gallons of Wasted Fuel (000)	1,652	1,626	1,616	1,605	1,590	1,578
Rank	64	64	63	63	63	62
Annual Congestion Cost (\$ million)	40	36	34	33	31	29
Rank	64	65	64	64	64	64

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

# Mobility Data for Allentown PA-NJ

Inventory Measures	2011	2010	2009	2008	2007	2006
<b>Urban Area Information</b>						
Population (1000s)	645	640	635	625	625	620
Rank	63	63	64	63	63	64
Commuters (1000s)	330	326	322	316	314	310
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	5,096	5,080	4,850	4,780	4,935	4,950
Arterial Streets	5,399	5,382	5,400	5,475	5,630	5,445
<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)	3.41	2.78	2.33	3.42	2.87	2.68
Diesel (\$/gallon)	3.79	3.12	2.73	4.41	3.56	2.93
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)	7,383	7,301	7,024	7,190	7,474	7,441
Rank	61	61	62	62	59	58
Fuel per Peak Auto Commuter (gallons)	15	16	14	14	15	15
Rank	74	68	71	80	73	73
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	15,459	15,145	14,296	14,070	14,625	14,562
Rank	64	63	63	64	63	60
Delay per Auto Commuter (pers-hrs)	32	32	30	30	31	31
Rank	82	81	83	81	81	80
<b>Travel Time Index</b>						
Rank	1.17	1.17	1.16	1.16	1.17	1.17
Rank	45	43	58	63	56	53
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	300	281	258	264	260	251
Rank	64	62	63	64	63	60
Cost per Auto Commuter (\$)	588	592	569	554	600	615
Rank	81	82	83	81	80	75
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	649	636	600	591	614	612
Rank	64	63	63	64	63	60
Annual Gallons of Wasted Fuel (000)	1,565	1,548	1,489	1,524	1,584	1,578
Rank	61	61	62	62	59	58
Annual Congestion Cost (\$ million)	31	29	26	28	27	25
Rank	63	61	62	61	60	60

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

# Mobility Data for Allentown PA-NJ

Inventory Measures	2005	2004	2003	2002	2001	2000
<b>Urban Area Information</b>						
Population (1000s)	620	620	615	610	605	600
Rank	62	61	62	62	62	62
Commuters (1000s)	308	306	302	296	290	284
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	5,085	4,870	4,600	4,200	4,050	3,920
Arterial Streets	5,425	5,350	5,300	5,280	5,250	5,210
<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)	2.28	1.94	1.51	1.36	1.54	1.51
Diesel (\$/gallon)	2.58	2.03	1.59	1.43	1.59	1.57
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)	7,436	7,346	7,276	7,509	7,480	7,505
Rank	57	57	57	53	53	53
Fuel per Peak Auto Commuter (gallons)	15	15	15	15	15	16
Rank	64	65	58	53	47	32
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	14,552	14,375	14,239	14,695	14,637	14,687
Rank	59	59	58	57	55	53
Delay per Auto Commuter (pers-hrs)	32	31	31	33	33	34
Rank	75	78	75	59	58	49
<b>Travel Time Index</b>						
Rank	1.17	1.17	1.17	1.17	1.17	1.18
Rank	50	47	45	41	38	36
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	240	227	216	217	214	209
Rank	59	59	58	57	54	53
Cost per Auto Commuter (\$)	633	646	660	695	701	724
Rank	69	66	64	50	47	42
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	611	604	598	617	615	617
Rank	59	59	58	57	55	53
Annual Gallons of Wasted Fuel (000)	1,576	1,557	1,543	1,592	1,586	1,591
Rank	57	57	57	53	53	53
Annual Congestion Cost (\$ million)	24	22	20	20	20	19
Rank	59	58	58	55	53	53

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

# Mobility Data for Allentown PA-NJ

Inventory Measures	1999	1998	1997	1996	1995	1994
<b>Urban Area Information</b>						
Population (1000s)	590	580	575	560	550	540
Rank	62	62	61	62	62	62
Commuters (1000s)	276	268	262	252	244	237
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	3,800	3,720	3,585	3,505	3,255	3,100
Arterial Streets	5,040	4,860	4,710	4,505	4,335	4,210
<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)	1.11	1.06	1.19	1.26	1.19	1.04
Diesel (\$/gallon)	1.19	1.20	1.30	1.39	1.32	1.15
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)	7,137	6,942	6,817	6,289	5,447	4,730
Rank	52	52	51	51	54	56
Fuel per Peak Auto Commuter (gallons)	15	14	15	15	13	12
Rank	32	31	17	13	19	21
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	13,967	13,585	13,340	12,306	10,659	9,256
Rank	53	52	51	52	53	56
Delay per Auto Commuter (pers-hrs)	33	33	33	31	28	25
Rank	51	46	45	46	52	61
<b>Travel Time Index</b>						
Rank	1.17	1.16	1.16	1.17	1.15	1.13
Rank	36	36	36	30	35	42
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	189	180	175	159	134	112
Rank	53	52	51	52	53	56
Cost per Auto Commuter (\$)	712	708	707	666	593	533
Rank	41	36	29	34	43	46
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	587	571	560	517	448	389
Rank	53	52	51	52	53	56
Annual Gallons of Wasted Fuel (000)	1,513	1,472	1,445	1,333	1,155	1,003
Rank	52	52	51	51	54	56
Annual Congestion Cost (\$ million)	17	16	16	15	12	10
Rank	52	52	51	51	52	56

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

# Mobility Data for Allentown PA-NJ

Inventory Measures	1993	1992	1991	1990	1989	1988
<b>Urban Area Information</b>						
Population (1000s)	530	525	520	505	500	490
Rank	62	62	61	62	62	62
Commuters (1000s)	230	225	220	210	207	201
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	2,940	2,670	2,480	2,430	2,310	2,225
Arterial Streets	4,020	3,800	3,560	3,450	3,375	3,315
<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)	1.09	1.14	1.16	1.30	1.06	0.98
Diesel (\$/gallon)	1.21	1.28	1.29	1.08	1.03	0.95
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)	4,043	3,543	3,044	2,867	2,445	2,339
Rank	59	60	61	61	63	62
Fuel per Peak Auto Commuter (gallons)	9	8	6	7	5	5
Rank	49	53	67	50	63	58
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	7,913	6,933	5,957	5,610	4,785	4,577
Rank	58	61	63	62	66	63
Delay per Auto Commuter (pers-hrs)	22	20	17	17	14	14
Rank	68	67	78	70	80	75
<b>Travel Time Index</b>						
Rank	44	49	62	76	66	60
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	94	80	67	61	49	45
Rank	58	60	62	61	66	63
Cost per Auto Commuter (\$)	468	420	371	367	331	333
Rank	57	63	68	65	69	65
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	332	291	250	236	201	192
Rank	58	61	63	62	66	63
Annual Gallons of Wasted Fuel (000)	857	751	645	608	518	496
Rank	59	60	61	61	63	62
Annual Congestion Cost (\$ million)	9	8	7	6	5	5
Rank	56	58	58	59	60	58

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

# Mobility Data for Allentown PA-NJ

Inventory Measures	1987	1986	1985	1984	1983	1982
<b>Urban Area Information</b>						
Population (1000s)	485	475	465	455	450	440
Rank	63	64	62	61	61	63
Commuters (1000s)	197	192	187	181	178	172
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	2,100	1,980	1,865	1,870	1,885	1,735
Arterial Streets	3,260	3,205	3,100	3,030	2,980	2,965
<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)	0.98	0.96	1.25	1.27	1.30	1.35
Diesel (\$/gallon)	0.95	0.93	1.22	1.23	1.26	1.32
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)	2,301	2,053	1,896	1,793	1,732	1,608
Rank	61	62	61	58	54	54
Fuel per Peak Auto Commuter (gallons)	6	4	4	4	4	3
Rank	32	54	50	41	35	34
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	4,504	4,017	3,710	3,509	3,389	3,147
Rank	60	63	63	60	56	56
Delay per Auto Commuter (pers-hrs)	14	13	12	12	12	11
Rank	64	64	63	56	51	53
<b>Travel Time Index</b>						
Rank	55	49	48	42	39	35
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	43	37	34	31	29	27
Rank	60	62	63	60	56	54
Cost per Auto Commuter (\$)	342	321	297	296	300	282
Rank	59	61	60	55	48	49
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	189	169	156	147	142	132
Rank	60	63	63	60	56	55
Annual Gallons of Wasted Fuel (000)	488	435	402	380	367	341
Rank	61	62	61	57	54	53
Annual Congestion Cost (\$ million)	5	4	4	4	3	3
Rank	56	58	55	49	55	52

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