

Performance Measure Summary – Akron, OH

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2007. There is no single performance measure that experts agree “says it all.” The best comparison of congestion levels and trends is done between regions of similar size, over several years, and with a few measures of congestion. 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. A few key points should be recognized by users of the Urban Mobility Report data.

Use the Trends – The multi-year performance measures are better indicators, in most cases, than 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 the top of a few 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. The ratio of travel time in the peak period to travel time in free-flow. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak.

Peak Travelers – Number of travelers (using any travel mode) who begin a trip during the morning or evening peak travel periods (6 to 9 a.m. and 4 to 7 p.m.).

Annual Delay per Traveler – A yearly sum of all the per-trip delays. This measure illustrates the effect of the per-mile congestion as well as the length of each trip. The extra time required to travel in the peak period is divided by the number of travelers who begin a trip during the peak period (6 to 9 a.m. and 4 to 7 p.m.).

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 (60 mph on freeways and 35 mph on arterials) – These values are used as the national comparison thresholds. Other speed values may be appropriate for urban areas or sub-regions.

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

Public Transportation – Regular route service from all public transportation providers in an urban area.

Operations Treatments – Freeway incident management, freeway ramp metering, arterial street signal coordination and arterial street access management.

Congestion Cost – Value of travel delay for 2007 (estimated at \$15.47 per hour of person travel and \$102.12 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon).

Annual Increase Needed to Maintain Constant Congestion Level – Number of lane-miles that must be added to the road system each year – or – the number of new transit riders or carpoolers that must be added to keep congestion levels the same as the previous year.

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). The annual change in miles traveled, therefore, includes both new travel due to growth and travel that previously occurred in areas designated as rural.

Number of Rush Hours – Time when system might have congestion.

The Mobility Data for Akron OH

Inventory Measures	2007	2006	2005	2004	2003	2002
Urban Area Information						
Population (1000s)	620	615	615	610	590	580
Rank	65	65	64	64	64	64
Urban Area (square miles)	390	390	390	385	375	370
Population Density (persons/sq mile)	1,590	1,577	1,577	1,584	1,573	1,568
Peak Travelers (1000s)	341	336	334	329	317	308
Freeway						
Daily Vehicle-Miles of Travel (1000s)	5,530	5,600	5,555	5,650	5,435	5,335
Lane-Miles	430	430	430	430	430	430
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	4,385	4,445	4,100	4,025	3,990	3,990
Lane-Miles	1,190	1,190	1,185	1,180	1,175	1,125
Public Transportation						
Annual Psgr-Miles of Travel (millions)	26.3	25.8	25.9	29.1	27.3	31.4
Annual Unlinked Psgr Trips (millions)	6.9	7.0	7.0	7.3	7.5	7.8
Cost Components						
Value of Time (\$/hour)	15.47	15.06	14.58	14.10	13.73	13.43
Commercial Cost (\$/hour)	102.12	98.77	94.06	86.24	82.38	79.96
Fuel Cost (\$/gallon)	2.88	2.58	2.24	1.81	1.52	1.38
System Performance	2007	2006	2005	2004	2003	2002
Congested Travel (% of peak VMT)	28	30	29	30	26	27
Congested System (% of lane-miles)	25	29	29	29	28	31
Congested Time (number of "Rush Hours")	4.8	5.0	4.8	5.0	4.6	4.4
Annual Increase Needed to Maintain Constant Congestion Level:						
Lane-miles	20	23	11	12	6	8
Transit Riders or Carpoolers (millions)	4	5	2	3	1	2
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	2,172	2,582	2,437	2,517	2,249	2,343
Rank	78	75	74	73	74	70
Fuel per Peak Traveler (gallons)	6	8	7	8	7	8
Rank	83	75	79	74	75	73
Annual Delay						
Total Delay (1000s of person-hours)	3,031	3,652	3,444	3,554	3,242	3,416
Rank	79	78	79	75	75	74
Delay per Peak Traveler (person-hours)	9	11	10	11	10	11
Rank	85	82	83	79	80	77
Delay due to Incidents (percent)	55	55	55	54	55	55
Travel Time Index	1.07	1.08	1.08	1.08	1.07	1.08
Rank	80	77	77	75	78	72
Congestion Cost						
Total Cost (\$ millions)	63	74	67	65	57	58
Rank	79	77	77	74	75	75
Cost per Peak Traveler (\$)	186	220	200	197	180	189
Rank	85	82	83	80	81	77

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

The Mobility Data for Akron OH, Continued

Inventory Measures	2001	2000	1999	1998	1997
Urban Area Information					
Population (1000s)	570	560	550	545	540
Rank	63	62	62	62	62
Urban Area (square miles)	370	365	360	360	355
Population Density (persons/sq mile)	1,541	1,534	1,528	1,514	1,521
Peak Travelers (1000s)	299	290	281	275	269
Freeway					
Daily Vehicle-Miles of Travel (1000s)	5,350	5,320	5,245	5,210	5,100
Lane-Miles	430	425	425	420	420
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	4,005	4,005	4,050	4,040	3,995
Lane-Miles	1,120	1,120	1,110	1,105	1,100
Public Transportation					
Annual Psgr-Miles of Travel (millions)	23.3	29.2	23.8	24.8	23.8
Annual Unlinked Psgr Trips (millions)	7.5	8.3	7.1	7.6	6.8
Cost Components					
Value of Time (\$/hour)	13.22	12.85	12.43	12.17	11.98
Commercial Cost (\$/hour)	80.88	80.75	74.23	72.61	74.32
Fuel Cost (\$/gallon)	1.30	1.55	1.14	1.11	1.13
System Performance	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)	27	27	27	27	26
Congested System (% of lane-miles)	31	31	31	31	31
Congested Time (number of "Rush Hours")	4.4	4.6	4.4	4.4	4.2
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	17	28	28	41	55
Transit Riders or Carpoolers (millions)	3	6	6	9	12
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	2,448	2,475	2,560	2,538	2,368
Rank	69	69	69	65	65
Fuel per Peak Traveler (gallons)	8	9	9	9	9
Rank	74	70	70	68	66
Annual Delay					
Total Delay (1000s of person-hours)	3,588	3,617	3,781	3,744	3,496
Rank	70	70	69	68	66
Delay per Peak Traveler (person-hours)	12	12	13	14	13
Rank	75	76	72	69	72
Delay due to Incidents (percent)	55	55	55	55	55
Travel Time Index	1.08	1.08	1.08	1.08	1.08
Rank	72	73	71	68	67
Congestion Cost					
Total Cost (\$ millions)	60	60	60	58	55
Rank	70	69	69	66	64
Cost per Peak Traveler (\$)	202	208	213	212	203
Rank	75	76	71	69	70

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.
 Note: Zeroes in the table reflect values less than 0.5.

The Mobility Data for Akron OH, Continued

Inventory Measures	1996	1995	1994	1993	1992
Urban Area Information					
Population (1000s)	535	535	530	530	525
Rank	62	62	62	60	60
Urban Area (square miles)	350	350	350	345	345
Population Density (persons/sq mile)	1,529	1,529	1,514	1,536	1,522
Peak Travelers (1000s)	263	260	254	251	246
Freeway					
Daily Vehicle-Miles of Travel (1000s)	4,775	4,635	4,715	4,580	4,230
Lane-Miles	415	415	415	415	415
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	4,105	3,900	3,770	3,520	3,365
Lane-Miles	1,080	1,075	1,075	1,075	1,070
Public Transportation					
Annual Psgr-Miles of Travel (millions)	21.4	21.2	20.2	25.9	24.0
Annual Unlinked Psgr Trips (millions)	6.7	6.5	6.9	7.5	8.1
Cost Components					
Value of Time (\$/hour)	11.71	11.37	11.06	10.78	10.47
Commercial Cost (\$/hour)	74.17	71.54	69.53	67.77	66.19
Fuel Cost (\$/gallon)	1.28	1.12	1.08	1.09	1.11
System Performance	1996	1995	1994	1993	1992
Congested Travel (% of peak VMT)	23	22	23	20	16
Congested System (% of lane-miles)	30	30	34	32	27
Congested Time (number of "Rush Hours")	3.8	3.6	3.6	3.2	2.9
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	57	51	58	62	69
Transit Riders or Carpoolers (millions)	12	10	11	12	12
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	1,999	1,600	1,854	1,483	1,195
Rank	65	70	66	68	69
Fuel per Peak Traveler (gallons)	8	6	7	6	5
Rank	66	74	67	72	77
Annual Delay					
Total Delay (1000s of person-hours)	3,032	2,436	2,825	2,271	1,876
Rank	66	70	68	69	69
Delay per Peak Traveler (person-hours)	12	9	11	9	8
Rank	70	77	71	75	77
Delay due to Incidents (percent)	54	53	54	53	54
Travel Time Index	1.07	1.06	1.07	1.05	1.05
Rank	68	73	65	75	73
Congestion Cost					
Total Cost (\$ millions)	46	36	40	31	25
Rank	66	70	65	69	69
Cost per Peak Traveler (\$)	176	138	158	125	103
Rank	71	76	71	76	79

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

The Mobility Data for Akron OH, Continued

Inventory Measures	1991	1990	1989	1988	1987
Urban Area Information					
Population (1000s)	520	520	520	515	515
Rank	59	59	57	57	56
Urban Area (square miles)	345	345	340	340	335
Population Density (persons/sq mile)	1,507	1,507	1,529	1,515	1,537
Peak Travelers (1000s)	240	237	235	231	229
Freeway					
Daily Vehicle-Miles of Travel (1000s)	4,140	4,145	4,105	3,870	3,435
Lane-Miles	415	415	415	415	415
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	3,215	3,070	2,910	2,725	2,615
Lane-Miles	1,070	1,070	1,065	1,065	1,065
Public Transportation					
Annual Psgr-Miles of Travel (millions)	22.0	20.2	20.4	20.9	15.7
Annual Unlinked Psgr Trips (millions)	7.8	7.2	7.1	7.4	7.1
Cost Components					
Value of Time (\$/hour)	10.17	9.75	9.25	8.83	8.48
Commercial Cost (\$/hour)	64.55	62.47	59.16	56.03	54.62
Fuel Cost (\$/gallon)	1.13	1.06	1.08	1.00	1.00
System Performance	1991	1990	1989	1988	1987
Congested Travel (% of peak VMT)	13	13	12	10	8
Congested System (% of lane-miles)	22	22	21	19	19
Congested Time (number of "Rush Hours")	2.8	2.8	2.8	2.7	2.4
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	57	75	55	53	65
Transit Riders or Carpoolers (millions)	10	13	9	8	9
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	958	917	856	680	477
Rank	71	71	70	72	77
Fuel per Peak Traveler (gallons)	4	4	4	3	2
Rank	77	74	73	75	81
Annual Delay					
Total Delay (1000s of person-hours)	1,507	1,439	1,366	1,101	755
Rank	73	72	71	74	77
Delay per Peak Traveler (person-hours)	6	6	6	5	3
Rank	81	78	76	77	83
Delay due to Incidents (percent)	54	54	54	53	53
Travel Time Index					
	1.04	1.04	1.04	1.03	1.02
Rank	73	72	71	75	83
Congestion Cost					
Total Cost (\$ millions)	20	18	16	12	8
Rank	72	72	72	73	77
Cost per Peak Traveler (\$)	82	76	69	53	35
Rank	81	81	79	81	85

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

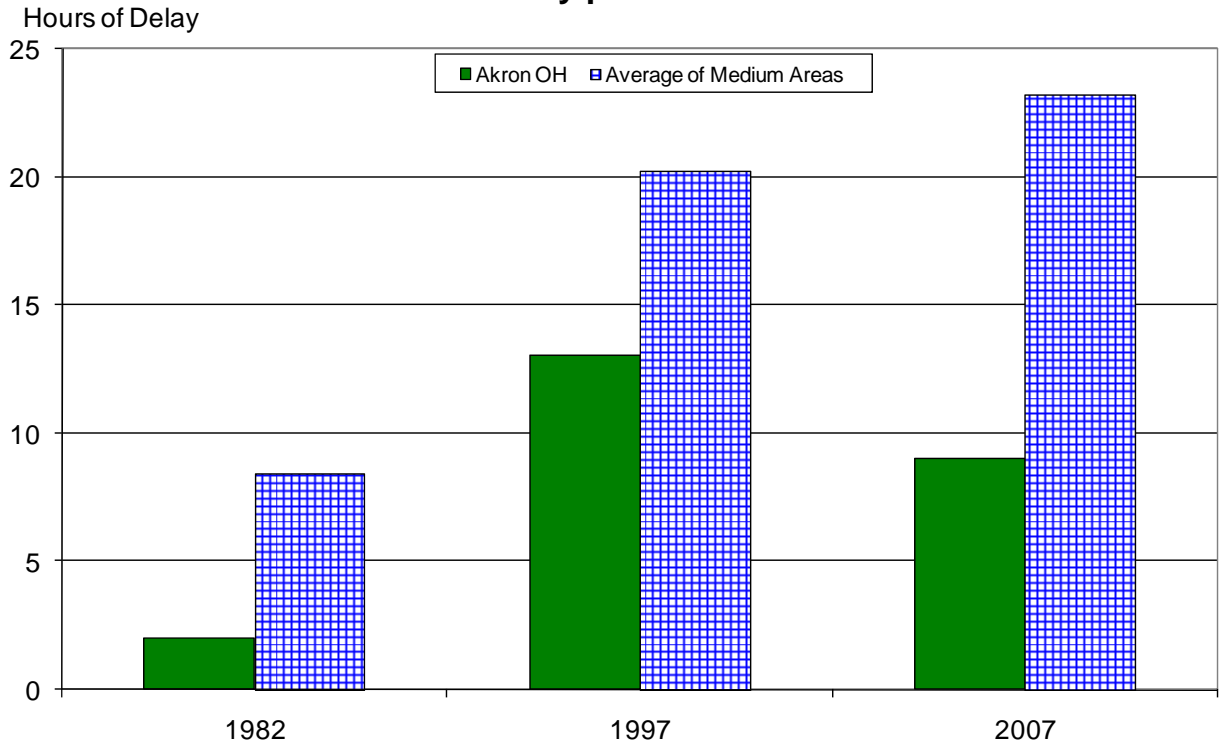
The Mobility Data for Akron OH, Continued

Inventory Measures	1986	1985	1984	1983	1982
Urban Area Information					
Population (1000s)	515	515	515	515	515
Rank	55	54	54	53	52
Urban Area (square miles)	335	330	330	330	330
Population Density (persons/sq mile)	1,537	1,561	1,561	1,561	1,561
Peak Travelers (1000s)	228	226	224	222	220
Freeway					
Daily Vehicle-Miles of Travel (1000s)	3,390	3,255	3,290	3,160	2,745
Lane-Miles	415	415	415	410	380
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	2,715	2,395	2,555	2,380	2,120
Lane-Miles	1,055	1,050	1,040	1,040	990
Public Transportation					
Annual Psgr-Miles of Travel (millions)	17.1	23.5	4.7	4.7	4.7
Annual Unlinked Psgr Trips (millions)	7.6	7.8	1.5	1.5	1.5
Cost Components					
Value of Time (\$/hour)	8.18	8.03	7.75	7.43	7.20
Commercial Cost (\$/hour)	52.63	55.80	54.65	52.70	52.13
Fuel Cost (\$/gallon)	0.98	1.28	1.29	1.32	1.38
System Performance	1986	1985	1984	1983	1982
Congested Travel (% of peak VMT)	7	7	7	6	5
Congested System (% of lane-miles)	19	19	19	16	16
Congested Time (number of "Rush Hours")	2.4	2.3	2.4	2.3	2.2
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	--	--	--	--	--
Transit Riders or Carpoolers (millions)	--	--	--	--	--
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	437	377	393	310	265
Rank	77	76	75	76	80
Fuel per Peak Traveler (gallons)	2	2	2	1	1
Rank	80	78	73	84	84
Annual Delay					
Total Delay (1000s of person-hours)	721	606	636	497	427
Rank	77	77	74	77	81
Delay per Peak Traveler (person-hours)	3	3	3	2	2
Rank	83	82	79	85	85
Delay due to Incidents (percent)	53	53	54	54	54
Travel Time Index	1.02	1.02	1.02	1.02	1.02
Rank	80	80	76	74	74
Congestion Cost					
Total Cost (\$ millions)	7	6	7	5	4
Rank	77	77	72	76	79
Cost per Peak Traveler (\$)	32	28	30	22	19
Rank	85	85	83	85	85

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

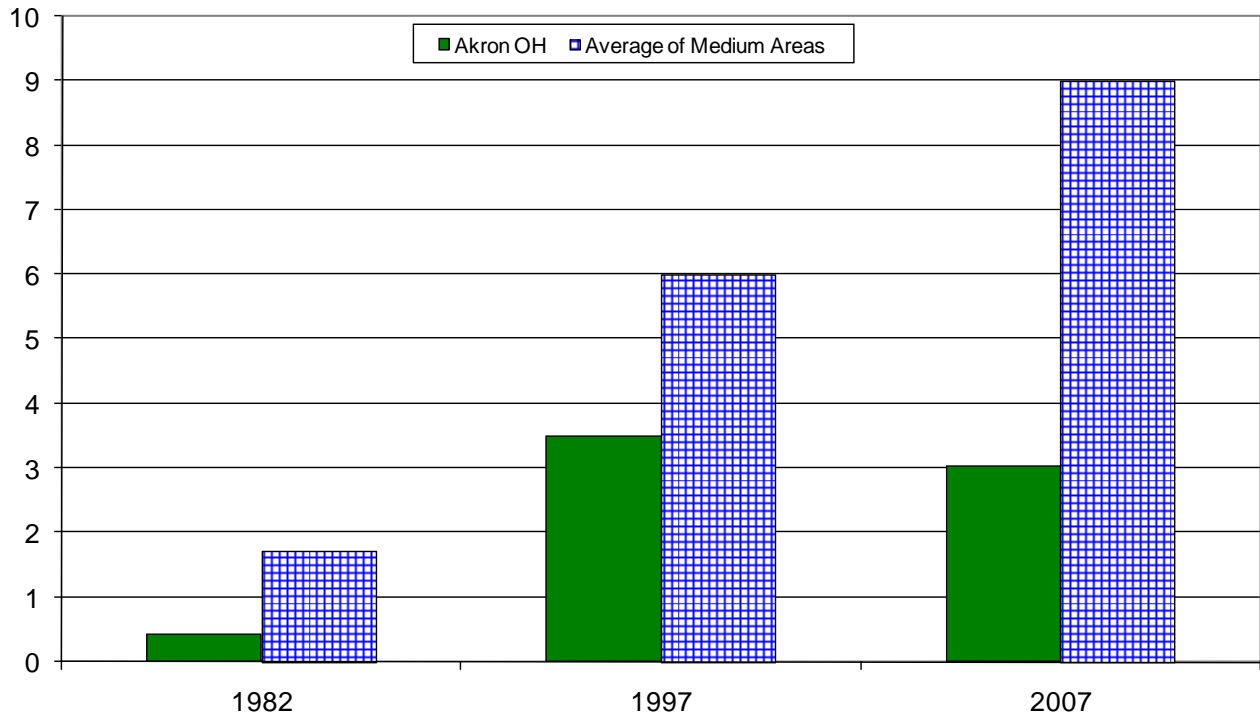
Growth in Delay per Peak Traveler



Note: Medium areas have populations between 0.5 and 1 million

Annual Hours of Delay (millions)

Growth in Total Delay



Note: Medium areas have populations between 0.5 and 1 million

**Benefits from Public Transportation Service and Operations Strategies in
Akron OH**

Operations Strategies	2007	2006	2005	2004
Freeway Ramp Metering				
Percent of Roadway Miles	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--
Freeway Incident Management				
Cameras				
Percent of Roadway Miles	2	--	--	--
Service Patrols				
Percent of Roadway Miles	--	--	--	--
Annual Delay Reduction (1000 hours)	0	--	--	--
Arterial Signal Coordination				
Percent of Roadway Miles	20	19	15	12
Annual Delay Reduction (1000 hours)	3	4	4	2
Arterial Access Management				
Percent of Roadway Miles	7	7	7	7
Annual Delay Reduction (1000 hours)	21	15	9	11
HOV Lanes				
Daily Passenger-miles of travel (1000s)	--	--	--	--
HOV User Delay Savings	--	--	--	--
Total Effect of Operations Treatments				
Annual Delay Reduction (1000 hours)	24	19	13	13
Annual Delay Saved per Peak Traveler (hours)	0	0	0	0
Annual Congestion Cost Savings (\$million)	0.5	0.4	0.2	0.2
Travel Time Index with Strategies	1.066	1.078	1.076	1.079
Travel Time Index (Base)	1.067	1.078	1.077	1.079
Public Transportation Service	2007	2006	2005	2004
Existing Service				
Annual Passenger-miles of travel (million)	26.3	25.8	25.9	29.1
Unlinked Passenger Trips (million)	6.9	7.0	7.0	7.3
Travel Time Index (combined road and transit)	1.066	1.078	1.076	1.078
Condition if Public Transportation Service were Discontinued				
Travel Time Index	1.067	1.081	1.078	1.081
Annual Increase				
Delay (1000 hours)	73	153	111	107
Delay per Peak Traveler (hours)	0	0	0	0
Congestion Cost (\$million)	1.5	3.1	2.2	2.0

**Benefits from Public Transportation Service and Operations Strategies in
Akron OH, Continued**

Operations Strategies	2003	2002	2001	2000
Freeway Ramp Metering				
Percent of Roadway Miles	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--
Freeway Incident Management				
Cameras				
Percent of Roadway Miles	--	--	--	--
Service Patrols				
Percent of Roadway Miles	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--
Arterial Signal Coordination				
Percent of Roadway Miles	6	6	5	5
Annual Delay Reduction (1000 hours)	2	1	2	1
Arterial Access Management				
Percent of Roadway Miles	7	6	6	6
Annual Delay Reduction (1000 hours)	2	15	13	20
HOV Lanes				
Daily Passenger-miles of travel (1000s)	--	--	--	--
HOV User Delay Savings	--	--	--	--
Total Effect of Operations Treatments				
Annual Delay Reduction (1000 hours)	4	16	15	21
Annual Delay Saved per Peak Traveler (hours)	0	0	0	0
Annual Congestion Cost Savings (\$million)	0.1	0.3	0.2	0.3
Travel Time Index with Strategies	1.072	1.076	1.079	1.080
Travel Time Index (Base)	1.072	1.076	1.080	1.081
Public Transportation Service	2003	2002	2001	2000
Existing Service				
Annual Passenger-miles of travel (million)	27.3	31.4	23.3	29.2
Unlinked Passenger Trips (million)	7.5	7.8	7.5	8.3
Travel Time Index (combined road and transit)	1.072	1.076	1.079	1.080
Condition if Public Transportation Service were Discontinued				
Travel Time Index	1.074	1.079	1.082	1.082
Annual Increase				
Delay (1000 hours)	98	162	125	112
Delay per Peak Traveler (hours)	0	1	0	0
Congestion Cost (\$million)	1.7	2.8	2.1	1.9

**Comparison of Several Key Mobility Performance Measures
Medium Group – 500,000 to 1 million population urban areas**

Urban Area	Delay per Traveler	Travel Time Index	Total Delay	1982 to 2007	
				Delay per Traveler	Total Delay
Nashville-Davidson, TN	H+	0	H+	F	F+
Salt Lake City, UT	H	H+	H+	F	F+
Richmond, VA	L	L-	H	0	F+
Louisville, KY-IN	H+	H+	H+	F+	F+
Hartford, CT	L	L	H	F	F+
Bridgeport-Stamford, CT-NY	H+	H+	H+	F+	F+
Oklahoma City, OK	H	L	H+	F+	F+
Tulsa, OK	0	L	0	0	F
Tucson, AZ	H+	H+	H+	F	F+
Dayton, OH	L-	L-	L-	S-	S-
Rochester, NY	L-	L-	L-	S-	S-
Birmingham, AL	H+	0	H+	F+	F+
Lancaster-Palmdale, CA	L-	L	L-	S-	S-
Honolulu, HI	H	H+	H	S	S
El Paso, TX-NM	L	L	L	0	S
Oxnard-Ventura, CA	H+	H+	H+	F+	F+
Sarasota-Bradenton, FL	H	H+	0	S-	0
Springfield, MA-CT	L-	L-	L-	S-	S-
Omaha, NE-IA	H	H	0	F+	F
Fresno, CA	L	0	L	S-	S-
Allentown-Bethlehem, PA-NJ	0	0	L	S	S-
Akron, OH	L-	L-	L-	S-	S-
Grand Rapids, MI	0	L	L	0	S
Albany-Schenectady, NY	L	L	L	0	S-
Albuquerque, NM	H+	H	H	F+	F+
New Haven, CT	L	L	L-	0	S-
Indio-Cathedral City-Palm Springs, CA	L-	0	L-	S-	S-
Toledo, OH-MI	L-	L-	L-	S	S-
Poughkeepsie-Newburgh, NY	L-	L-	L-	S-	S-
Bakersfield, CA	L-	L-	L-	S-	S-
Colorado Springs, CO	0	0	L	F	S-

0 – Average congestion levels or average congestion growth

H Higher congestion; H+ Much higher congestion; F Faster congestion growth; F+ Much faster growth
L Lower congestion; L- Much lower congestion; S Slower congestion growth; S- Much slower growth

Key Mobility Performance Measure Labels

Note: Designation of an urban area congestion problem as “Much higher”, “Much faster growth”, etc. is determined using a general indicator of the accuracy of the congestion estimates. For regions with the same indicator label, there may be no difference in congestion levels. Different values are used for the indicators in regions over 1 million population and below 1 million population.

Measures	Differences Within These Values May Not Indicate a Difference in Congestion Level	
	Above 1M Population	Below 1M Population
2007 Values Delay per Traveler - Travel Time Index - Total Delay -	Above 1M Population 5 Hours 5 Index Points 5 Hours x Average Population	Below 1M Population 3 Hours 3 Index Points 3 Hours x Average Population
1982 to 2007 Trends Delay per Traveler - Total Delay -	5 Hours 5 Hours x Average Population	3 Hours 3 Hours x Average Population