Performance Measure Summary

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2005. 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 aspects. 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*).

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 2005	
				Delay per Traveler	Total Delay
Jacksonville, FL	**H+**	**H+**	**H+**	**F**	**F+**
Nashville-Davidson, TN	H+	0	H+	0	F+
Salt Lake City, UT	0	H	H	0	F+
Raleigh-Durham, NC	H+	H	H+	F+	F+
Richmond, VA	L-	L-	0	S-	S
Louisville, KY-IN	H+	H+	H+	F+	F+
Hartford, CT	L-	L-	L	S	S-
Bridgeport-Stamford, CT-NY	H	H+	H+	F	F+
Charlotte, NC-SC	H+	H+	H+	F+	F+
Austin, TX	H+	H+	H+	F+	F+
Oklahoma City, OK	L-	L-	L	S	S-
Tulsa, OK	L-	L-	L	S-	S-
Tucson, AZ	H+	H+	H+	0	F+
Dayton, OH	L-	L-	L-	S-	S-
Honolulu, HI	L	H+	L	S-	S-
Birmingham, AL	H+	0	H	F+	F+
El Paso, TX-NM	L	0	L	F	S-
Rochester, NY	L-	L-	L-	S-	S-
Springfield, MA-CT	L-	L-	L-	S-	S-
Omaha, NE-IA	L	0	L	0	S-
Sarasota-Bradenton, FL	L	H	L	S-	S-
Allentown-Bethlehem, PA-NJ	L-	L	L-	S-	S-
Akron, OH	L-	L-	L-	S-	S-
Fresno, CA	L-	L	L-	S-	S-
Grand Rapids, MI	L	L-	L-	0	S-
Oxnard-Ventura, CA	H+	H+	0	F+	F+
Albuquerque, NM	H+	0	0	F	S
New Haven, CT	L-	L-	L-	S-	S-
Albany-Schenectady, NY	L-	L-	L-	S-	S-
Toledo, OH-MI	L-	L-	L-	S-	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

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 2005 (estimated at $14.60 per hour of person travel and $77.10 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

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	
2005 Values	**Above 1M Population**	**Below 1M Population**
Delay per Traveler -	5 Hours	3 Hours
Travel Time Index -	5 Index Points	3 Index Points
Total Delay -	5 Hours x Average Population	3 Hours x Average Population
1982 to 2005 Trends		
Delay per Traveler -	5 Hours	3 Hours
Total Delay -	5 Hours x Average Population	3 Hours x Average Population

The Mobility Data for Jacksonville, FL

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	990	965	925	905	890	865
Rank	40	40	42	41	41	41
Urban Area (square miles)	750	750	750	745	740	735
Popn Density (persons/sq mile)	1,320	1,287	1,233	1,215	1,203	1,177
Peak Travelers (1000s)	538	521	497	481	466	447
Freeway						
Daily Vehicle-Miles of Travel (1000s)	11,190	10,825	10,275	9,965	9,750	9,835
Lane Miles	775	760	735	730	720	720
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	10,000	9,895	9,275	8,925	8,555	8,565
Lane Miles	1,500	1,490	1,480	1,480	1,470	1,470
Public Transportation						
Annual Psgr-Miles of Travel (millions)	67	66	68	59	60	48
Annual Unlinked Psgr Trips (millions)	11	10	10	9	9	9
Cost Components						
Value of Time ($/hour)	14.60	14.10	13.75	13.45	13.25	12.85
Commercial Cost ($/hour)	77.10	74.60	72.65	71.05	69.95	68.00
Fuel Cost ($/gallon)	2.34	1.99	1.53	1.41	1.51	1.54
System Performance						
Congested Travel (% of peak VMT)	60	58	55	53	50	51
Congested System (% of lane-miles)	53	52	52	52	48	48
Congested Time (number of "Rush Hours")	7.2	7.0	6.8	6.4	6.2	6.4
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	65	73	51	51	52	85
Transit Riders or Carpoolers (millions)	21	23	16	15	15	25
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	13,997	14,003	12,642	11,356	9,765	9,671
Rank	35	35	36	36	39	39
Fuel per Peak Traveler (gallons)	26	27	25	24	21	22
Rank	31	26	27	29	33	31
Annual Delay						
Total Delay (1000s of person-hours)	20,779	21,516	19,321	17,576	15,093	14,970
Rank	35	32	35	36	39	37
Delay per Peak Traveler (person-hrs)	39	41	39	37	32	33
Rank	29	25	25	25	34	31
Delay due to Incidents (percent)	54	54	54	54	54	53
Travel Time Index	1.21	1.22	1.21	1.19	1.17	1.17
Rank	35	31	33	34	40	38
Congestion Cost						
Total Cost ($ millions)	376	372	321	283	239	232
Rank	36	35	36	36	39	39
Cost per Peak Traveler ($)	699	714	646	588	513	519
Rank	34	27	28	28	36	33

Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

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

The Mobility Data for Jacksonville, FL, Continued

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	850	840	825	820	805	785
Rank	42	42	43	43	43	43
Urban Area (square miles)	735	720	665	650	600	555
Popn Density (persons/sq mile)	1,156	1,167	1,241	1,262	1,342	1,414
Peak Travelers (1000s)	434	424	411	403	391	377
Freeway						
Daily Vehicle-Miles of Travel (1000s)	9,355	9,025	8,650	8,150	7,000	6,520
Lane Miles	700	675	650	600	550	530
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	8,325	8,425	8,205	8,120	8,200	8,275
Lane Miles	1,465	1,460	1,450	1,445	1,435	1,425
Public Transportation						
Annual Psgr-Miles of Travel (millions)	46	43	55	46	48	51
Annual Unlinked Psgr Trips (millions)	9	9	9	9	9	10
Cost Components						
Value of Time ($/hour)	12.40	12.15	12.00	11.70	11.40	11.05
Commercial Cost ($/hour)	65.80	64.35	63.40	61.95	60.20	58.50
Fuel Cost ($/gallon)	1.14	1.07	1.17	1.30	1.20	1.08
System Performance						
Congested Travel (% of peak VMT)	49	50	50	53	51	49
Congested System (% of lane-miles)	49	49	49	51	51	50
Congested Time (number of "Rush Hours")	6.0	6.2	6.0	6.2	5.8	5.8
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	78	91	84	85	68	74
Transit Riders or Carpoolers (millions)	22	26	24	23	18	19
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	9,736	9,729	9,991	10,347	9,726	8,515
Rank	37	35	33	30	30	31
Fuel per Peak Traveler (gallons)	22	23	24	26	25	23
Rank	32	27	21	14	11	15
Annual Delay						
Total Delay (1000s of person-hours)	15,282	15,437	16,118	16,181	15,606	13,799
Rank	38	33	33	30	31	30
Delay per Peak Traveler (person-hrs)	35	36	39	40	40	37
Rank	28	24	16	12	11	11
Delay due to Incidents (percent)	54	54	54	54	54	54
Travel Time Index	1.17	1.18	1.19	1.20	1.20	1.18
Rank	39	37	31	23	20	24
Congestion Cost						
Total Cost ($ millions)	227	224	233	230	215	183
Rank	38	33	33	30	30	31
Cost per Peak Traveler ($)	522	527	567	570	549	486
Rank	30	28	18	12	10	12

Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

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

The Mobility Data for Jacksonville, FL, Continued

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	770	760	750	720	715	690
Rank	43	43	42	42	42	43
Urban Area (square miles)	545	540	540	540	540	535
Popn Density (persons/sq mile)	1,413	1,407	1,389	1,333	1,324	1,290
Peak Travelers (1000s)	365	356	347	328	323	310
Freeway						
Daily Vehicle-Miles of Travel (1000s)	6,065	5,760	5,470	5,375	5,010	5,205
Lane Miles	500	480	460	440	430	430
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	8,090	8,080	7,810	7,470	7,280	7,115
Lane Miles	1,420	1,420	1,405	1,400	1,390	1,385
Public Transportation						
Annual Psgr-Miles of Travel (millions)	48	48	46	46	47	42
Annual Unlinked Psgr Trips (millions)	10	10	10	9	8	8
Cost Components						
Value of Time ($/hour)	10.75	10.50	10.25	10.00	9.25	8.80
Commercial Cost ($/hour)	57.05	55.40	53.80	51.60	48.95	46.70
Fuel Cost ($/gallon)	1.13	1.12	1.10	1.05	1.08	1.00
System Performance						
Congested Travel (% of peak VMT)	49	48	42	42	37	36
Congested System (% of lane-miles)	50	47	41	41	40	39
Congested Time (number of "Rush Hours")	5.6	5.6	5.4	5.4	5.2	5.2
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	54	72	57	58	39	54
Transit Riders or Carpoolers (millions)	14	18	14	14	9	13
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	7,900	7,596	6,387	6,008	5,241	4,857
Rank	32	30	31	31	30	32
Fuel per Peak Traveler (gallons)	22	21	18	18	16	16
Rank	16	16	20	18	20	20
Annual Delay						
Total Delay (1000s of person-hours)	12,828	12,273	10,330	9,717	8,836	8,019
Rank	30	29	29	29	29	31
Delay per Peak Traveler (person-hrs)	35	35	30	30	27	26
Rank	13	15	18	17	18	17
Delay due to Incidents (percent)	53	54	54	54	53	53
Travel Time Index	1.18	1.17	1.15	1.14	1.13	1.12
Rank	22	22	25	24	23	28
Congestion Cost						
Total Cost ($ millions)	166	155	127	116	98	85
Rank	31	29	30	30	29	32
Cost per Peak Traveler ($)	455	436	366	354	302	273
Rank	13	14	19	18	19	19

Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

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

The Mobility Data for Jacksonville, FL, Continued

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	660	650	645	630	620	615
Rank	44	44	44	44	44	44
Urban Area (square miles)	535	535	530	530	520	520
Popn Density (persons/sq mile)	1,234	1,215	1,217	1,189	1,192	1,183
Peak Travelers (1000s)	294	287	283	274	268	263
Freeway						
Daily Vehicle-Miles of Travel (1000s)	4,715	4,720	4,480	4,505	4,085	3,900
Lane Miles	430	425	420	410	390	390
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	6,775	6,710	6,520	6,555	6,565	6,285
Lane Miles	1,375	1,375	1,365	1,360	1,360	1,350
Public Transportation						
Annual Psgr-Miles of Travel (millions)	42	42	42	44	44	44
Annual Unlinked Psgr Trips (millions)	8	8	10	10	10	10
Cost Components						
Value of Time ($/hour)	8.50	8.20	8.00	7.75	7.45	7.20
Commercial Cost ($/hour)	44.85	43.30	42.50	41.05	39.35	38.10
Fuel Cost ($/gallon)	1.00	0.98	1.28	1.29	1.32	1.38
System Performance						
Congested Travel (% of peak VMT)	32	31	27	27	25	21
Congested System (% of lane-miles)	39	38	37	36	32	28
Congested Time (number of "Rush Hours")	4.4	4.4	4.2	4.4	4.2	3.6
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	44	- -	- -	- -	- -	- -
Transit Riders or Carpoolers (millions)	10	- -	- -	- -	- -	- -
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	4,074	3,942	3,472	3,588	3,141	2,436
Rank	34	31	30	28	30	32
Fuel per Peak Traveler (gallons)	14	14	12	13	12	9
Rank	20	17	16	13	12	19
Annual Delay						
Total Delay (1000s of person-hours)	6,836	6,696	5,962	6,241	5,514	4,259
Rank	33	29	30	28	28	32
Delay per Peak Traveler (person-hrs)	23	23	21	23	21	16
Rank	20	14	15	13	11	15
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index	1.11	1.10	1.10	1.10	1.09	1.07
Rank	29	25	29	23	23	30
Congestion Cost						
Total Cost ($ millions)	70	66	58	59	51	38
Rank	33	30	30	28	29	32
Cost per Peak Traveler ($)	238	230	206	217	190	145
Rank	22	17	16	13	12	17

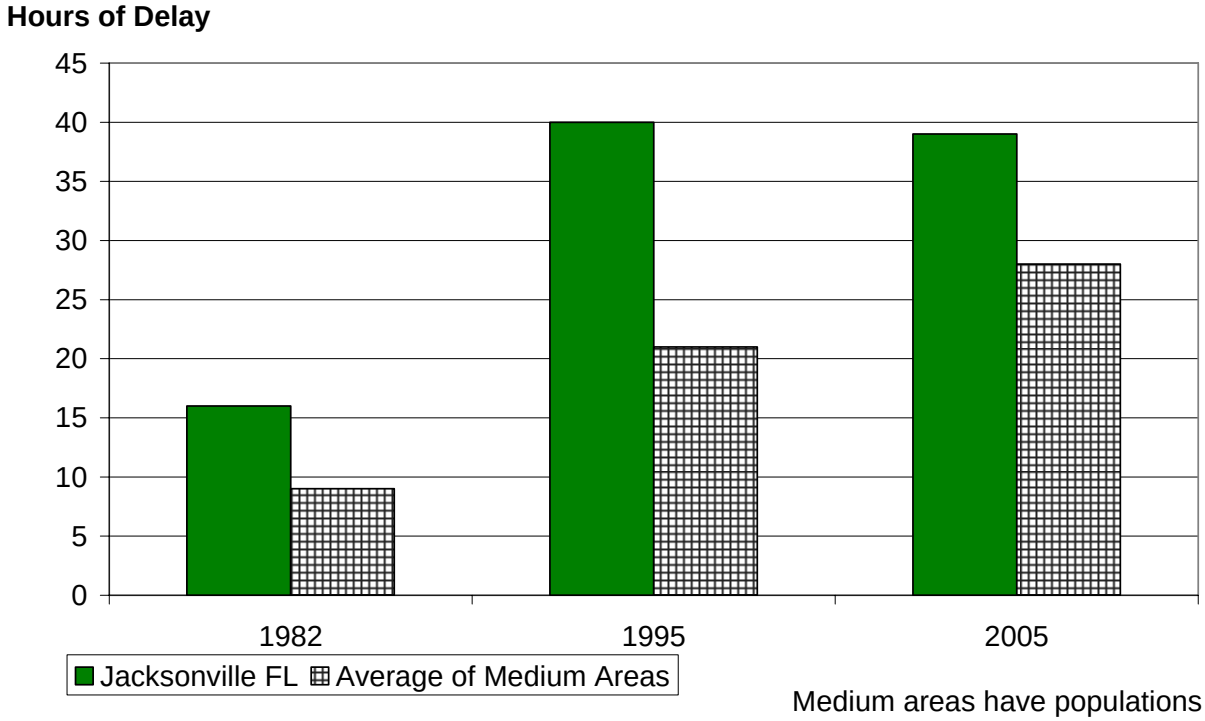
Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

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

Benefits From Public Transportation Service and Operations Strategies for Jacksonville, FL

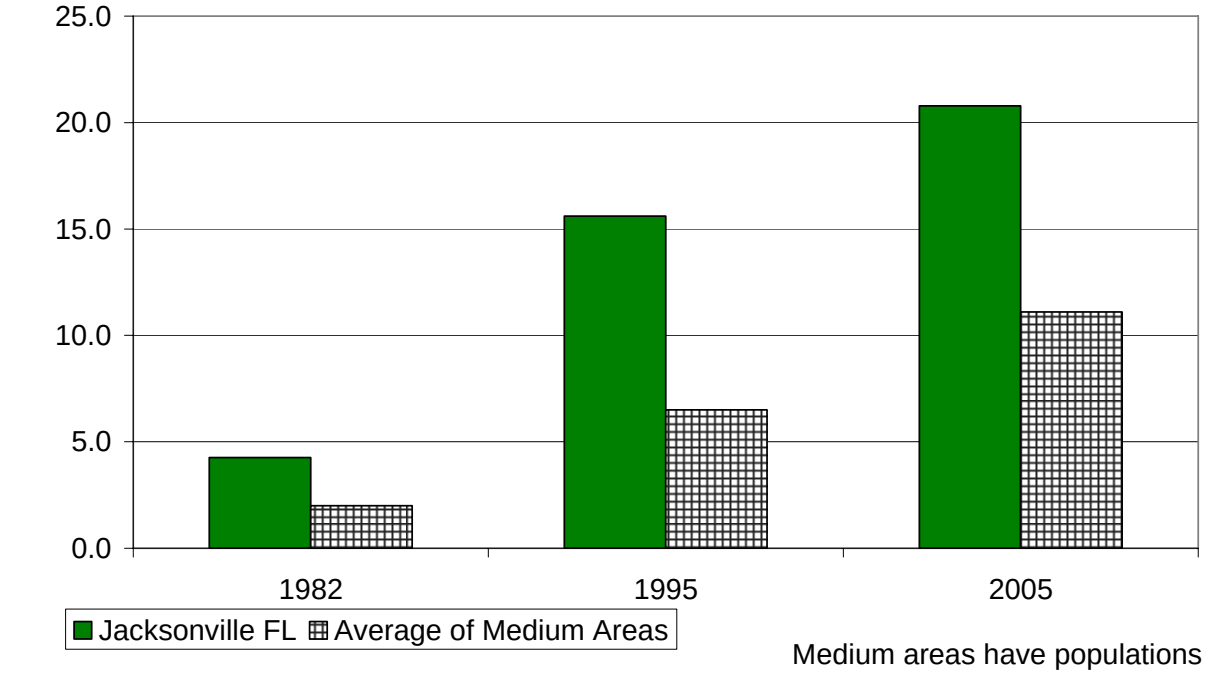
Operations Strategies	2005	2004	2003	2002	2001	2000
Freeway Ramp Metering						
Percent of Roadway Miles	--	--	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--	--	--
Freeway Incident Management						
Cameras						
Percent of Roadway Miles	13	13	14	14	14	14
Service Patrols						
Percent of Roadway Miles	100	100	100	100	86	65
Annual Delay Reduction (1000 hours)	377	465	426	342	236	143
Arterial Signal Coordination						
Percent of Roadway Miles	72	72	72	61	61	61
Annual Delay Reduction (1000 hours)	139	158	177	118	81	82
Arterial Access Management						
Percent of Roadway Miles	32	32	32	24	24	24
Annual Delay Reduction (1000 hours)	492	432	334	325	211	197
HOV Lanes						
Daily Passenger-miles of Travel (1000s)	--	--	--	--	--	--
HOV User Delay Savings	--	--	--	--	--	--
Total Effect of Operations Treatments						
Annual Delay Reduction (1000 hours)	1,008	1,054	938	785	528	422
Annual Delay Saved per Peak Traveler (hours)	2	2	2	2	1	1
Annual Congestion Cost Savings ($million)	18.4	18.4	15.7	12.8	8.6	6.7
Travel Time Index with Strategies	1.214	1.220	1.209	1.193	1.170	1.167
Travel Time Index (Base)	1.225	1.230	1.218	1.201	1.176	1.172
Public Transportation Service						
Existing Service						
Annual Passenger-miles of Travel (million)	67	66	68	59	60	48
Unlinked Passenger Trips (million)	11	10	10	9	9	9
Travel Time Index (combined road and transit)	1.209	1.214	1.203	1.189	1.166	1.165
Condition if Public Transportation Service were Discontinued						
Travel Time Index	1.227	1.234	1.223	1.206	1.178	1.176
Annual Delay Increase (1000 hours)	498	592	662	545	414	410
Annual Delay Increase per Peak Traveler (hours)	1	1	1	1	1	1
Annual Congestion Cost Increase ($million)	9.1	10.3	11.1	8.9	6.6	6.4

Growth in Delay per Peak Traveler



Medium areas have populations between 0.5 and 1 million

Growth in Total Delay



Medium areas have populations between 0.5 and 1 million