

## 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-
<b>Sarasota-Bradenton, FL</b>	<b>L</b>	<b>H</b>	<b>L</b>	<b>S-</b>	<b>S-</b>
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	
	Above 1M Population	Below 1M Population
<b>2005 Values</b> Delay per Traveler - Travel Time Index - Total Delay -	5 Hours 5 Index Points 5 Hours x Average Population	3 Hours 3 Index Points 3 Hours x Average Population
<b>1982 to 2005 Trends</b> Delay per Traveler - Total Delay -	5 Hours 5 Hours x Average Population	3 Hours 3 Hours x Average Population

**The Mobility Data for Sarasota-Bradenton, FL**

<b>Inventory Measures</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
<b>Urban Area Information</b>						
Population (1000s)	640	620	590	570	550	535
Rank	59	60	62	63	66	66
Urban Area (square miles)	500	500	495	490	485	480
Popn Density (persons/sq mile)	1,280	1,240	1,192	1,163	1,134	1,115
Peak Travelers (1000s)	348	335	317	303	288	277
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	2,510	2,325	2,100	1,900	1,700	1,500
Lane Miles	165	160	145	130	115	100
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	6,575	6,400	6,110	5,815	5,525	5,385
Lane Miles	940	925	920	915	915	910
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	13	14	17	18	16	15
Annual Unlinked Psgr Trips (millions)	3	3	3	3	3	2
<b>Cost Components</b>						
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
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	48	48	47	46	46	46
<b>Congested System</b> (% of lane-miles)	44	44	44	44	45	45
<b>Congested Time</b> (number of "Rush Hours")	7.6	7.4	7.4	7.4	7.2	7.2
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	63	66	65	65	63	62
Transit Riders or Carpoolers (millions)	18	18	17	17	15	15
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	5,293	5,099	4,702	4,420	4,158	3,972
Rank	57	57	58	58	62	61
Fuel per Peak Traveler (gallons)	15	15	15	15	14	14
Rank	50	48	48	49	52	49
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	8,840	8,572	7,924	7,536	7,060	6,770
Rank	55	55	58	56	59	60
Delay per Peak Traveler (person-hrs)	25	26	25	25	24	24
Rank	48	47	48	47	48	47
Delay due to Incidents (percent)	53	53	53	53	53	52
<b>Travel Time Index</b>						
Rank	1.19	1.19	1.18	1.18	1.18	1.18
Rank	36	38	38	37	34	35
<b>Congestion Cost</b>						
Total Cost (\$ millions)	156	145	128	118	110	102
Rank	56	56	58	57	60	62
Cost per Peak Traveler (\$)	450	434	405	391	380	368
Rank	48	47	48	50	47	49

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 Sarasota-Bradenton, FL, Continued**

<b>Inventory Measures</b>	<b>1999</b>	<b>1998</b>	<b>1997</b>	<b>1996</b>	<b>1995</b>	<b>1994</b>
<b>Urban Area Information</b>						
Population (1000s)	525	515	505	505	500	490
Rank	65	65	65	65	65	66
Urban Area (square miles)	480	475	495	470	470	460
Popn Density (persons/sq mile)	1,094	1,084	1,020	1,074	1,064	1,065
Peak Travelers (1000s)	268	260	251	248	243	235
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	1,300	1,100	850	650	500	400
Lane Miles	90	89	70	60	55	50
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	5,200	5,000	4,850	4,710	4,600	4,450
Lane Miles	905	900	895	890	890	885
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	14	13	14	12	11	10
Annual Unlinked Psgr Trips (millions)	3	2	3	3	2	2
<b>Cost Components</b>						
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
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	47	44	45	45	40	43
<b>Congested System</b> (% of lane-miles)	45	46	46	47	42	47
<b>Congested Time</b> (number of "Rush Hours")	7.2	6.4	6.2	5.8	5.6	5.2
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	60	51	40	29	28	31
Transit Riders or Carpoolers (millions)	14	11	8	6	5	5
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	4,076	3,488	3,360	3,115	2,580	2,683
Rank	61	62	59	60	62	60
Fuel per Peak Traveler (gallons)	15	13	13	13	11	11
Rank	47	53	51	52	57	51
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	7,073	6,057	5,863	5,443	4,505	4,725
Rank	58	62	57	60	60	59
Delay per Peak Traveler (person-hrs)	26	23	23	22	19	20
Rank	44	48	47	49	56	48
Delay due to Incidents (percent)	52	52	52	52	52	52
<b>Travel Time Index</b>						
Rank	31	36	35	33	38	26
<b>Congestion Cost</b>						
Total Cost (\$ millions)	101	85	82	74	60	61
Rank	61	62	59	60	62	59
Cost per Peak Traveler (\$)	377	327	324	299	247	258
Rank	45	52	49	51	57	51

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 Sarasota-Bradenton, FL, Continued**

<b>Inventory Measures</b>	<b>1993</b>	<b>1992</b>	<b>1991</b>	<b>1990</b>	<b>1989</b>	<b>1988</b>
<b>Urban Area Information</b>						
Population (1000s)	475	465	455	430	405	390
Rank	67	67	67	69	69	69
Urban Area (square miles)	460	430	420	405	395	385
Popn Density (persons/sq mile)	1,033	1,081	1,083	1,062	1,025	1,013
Peak Travelers (1000s)	225	218	210	196	183	175
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	370	345	350	340	320	300
Lane Miles	50	50	50	50	50	45
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	4,385	4,300	4,275	4,085	3,815	3,650
Lane Miles	880	880	875	855	825	800
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	9	9	9	8	8	7
Annual Unlinked Psgr Trips (millions)	2	2	2	2	2	2
<b>Cost Components</b>						
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
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	42	38	38	36	34	34
<b>Congested System</b> (% of lane-miles)	47	43	43	43	42	43
<b>Congested Time</b> (number of "Rush Hours")	5.2	5.0	5.0	4.6	4.2	4.2
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	35	37	43	28	18	17
Transit Riders or Carpoolers (millions)	6	6	8	5	3	3
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	2,594	2,274	2,253	1,997	1,731	1,607
Rank	60	60	55	57	59	58
Fuel per Peak Traveler (gallons)	12	10	11	10	9	9
Rank	47	48	45	47	44	42
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	4,584	4,055	4,013	3,506	3,046	2,808
Rank	55	57	53	54	56	55
Delay per Peak Traveler (person-hrs)	20	19	19	18	17	16
Rank	45	46	41	42	41	41
Delay due to Incidents (percent)	52	52	52	52	52	52
<b>Travel Time Index</b>						
Rank	1.17	1.15	1.15	1.14	1.13	1.12
Rank	26	28	26	26	25	26
<b>Congestion Cost</b>						
Total Cost (\$ millions)	58	50	48	41	33	29
Rank	56	58	54	56	57	57
Cost per Peak Traveler (\$)	256	229	229	208	181	166
Rank	47	47	42	44	43	41

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

The Mobility Data for Sarasota-Bradenton, FL, Continued

<b>Inventory Measures</b>	<b>1987</b>	<b>1986</b>	<b>1985</b>	<b>1984</b>	<b>1983</b>	<b>1982</b>
<b>Urban Area Information</b>						
Population (1000s)	380	370	360	350	340	325
Rank	69	69	69	70	70	70
Urban Area (square miles)	380	365	350	340	330	320
Popn Density (persons/sq mile)	1,000	1,014	1,029	1,029	1,030	1,016
Peak Travelers (1000s)	169	164	158	152	147	139
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	270	260	250	240	240	240
Lane Miles	45	45	45	45	45	45
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	3,545	3,420	3,550	3,485	3,345	3,000
Lane Miles	780	760	745	735	715	700
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	7	5	7	13	13	13
Annual Unlinked Psgr Trips (millions)	1	2	2	2	2	2
<b>Cost Components</b>						
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
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	36	35	39	39	38	29
<b>Congested System</b> (% of lane-miles)	47	42	42	42	42	42
<b>Congested Time</b> (number of "Rush Hours")	4.0	4.0	4.6	4.6	4.4	3.4
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	27	--	--	--	--	--
Transit Riders or Carpoolers (millions)	4	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	1,672	1,583	1,848	1,789	1,659	1,129
Rank	54	51	42	41	40	46
Fuel per Peak Traveler (gallons)	10	10	12	12	11	8
Rank	36	34	21	17	13	26
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	2,918	2,773	3,220	3,110	2,899	2,013
Rank	52	50	42	40	37	44
Delay per Peak Traveler (person-hrs)	17	17	20	20	20	15
Rank	34	31	17	14	13	22
Delay due to Incidents (percent)	52	52	52	52	52	52
<b>Travel Time Index</b>						
Rank	1.13	1.13	1.15	1.15	1.14	1.10
Rank	19	17	10	9	7	16
<b>Congestion Cost</b>						
Total Cost (\$ millions)	29	27	31	29	26	18
Rank	52	50	42	41	38	45
Cost per Peak Traveler (\$)	173	164	196	191	179	127
Rank	37	32	18	17	15	22

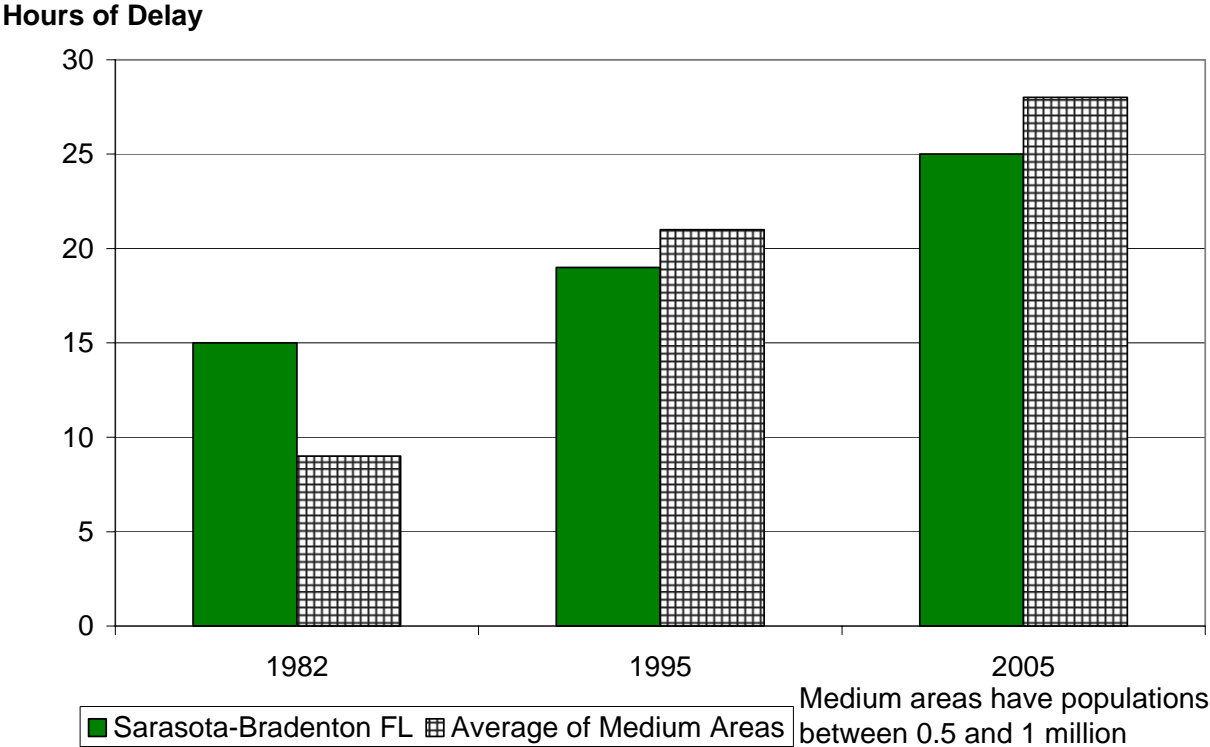
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**Benefits From Public Transportation Service and Operations Strategies for Sarasota-Bradenton, FL**

<b>Operations Strategies</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
<b>Freeway Ramp Metering</b>						
Percent of Roadway Miles	--	--	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--	--	--
<b>Freeway Incident Management</b>						
<b>Cameras</b>						
Percent of Roadway Miles	--	--	--	--	--	--
<b>Service Patrols</b>						
Percent of Roadway Miles	47	47	34	38	--	--
Annual Delay Reduction (1000 hours)	12	10	3	2	--	--
<b>Arterial Signal Coordination</b>						
Percent of Roadway Miles	68	67	51	44	40	40
Annual Delay Reduction (1000 hours)	73	77	87	78	45	44
<b>Arterial Access Management</b>						
Percent of Roadway Miles	60	56	40	40	40	40
Annual Delay Reduction (1000 hours)	422	427	349	347	360	352
<b>HOV Lanes</b>						
Daily Passenger-miles of Travel (1000s)	--	--	--	--	--	--
HOV User Delay Savings	--	--	--	--	--	--
<b>Total Effect of Operations Treatments</b>						
Annual Delay Reduction (1000 hours)	506	514	440	427	404	396
Annual Delay Saved per Peak Traveler (hours)	1	2	1	1	1	1
Annual Congestion Cost Savings (\$million)	8.9	8.7	7.1	6.7	6.2	5.9
Travel Time Index with Strategies	1.185	1.186	1.182	1.182	1.182	1.182
Travel Time Index (Base)	1.195	1.196	1.191	1.191	1.191	1.192
<b>Public Transportation Service</b>						
<b>Existing Service</b>						
Annual Passenger-miles of Travel (million)	13	14	17	18	16	15
Unlinked Passenger Trips (million)	3	3	3	3	3	2
Travel Time Index (combined road and transit)	1.183	1.183	1.178	1.178	1.178	1.179
<b>Condition if Public Transportation Service were Discontinued</b>						
Travel Time Index	1.195	1.196	1.191	1.192	1.191	1.192
Annual Delay Increase (1000 hours)	82	79	111	117	93	94
Annual Delay Increase per Peak Traveler (hours)	0	0	0	0	0	0
Annual Congestion Cost Increase (\$million)	1.4	1.3	1.8	1.8	1.4	1.4

### Growth in Delay per Peak Traveler



### Growth in Total Delay

