

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 Large Group – 1 million to 3 million population urban areas

Urban Area	Delay per Traveler	Travel Time Index	Total Delay	1982 to 2005	
				Delay per Traveler	Total Delay
San Diego, CA	H+	H+	H+	F+	F+
Minneapolis-St. Paul, MN	H	0	H+	F+	F+
Baltimore, MD	H	H	H+	F	F+
Tampa-St. Petersburg, FL	H+	H	H+	S	F+
St. Louis, MO-IL	L	L-	0	S	0
Denver-Aurora, CO	H+	H+	H+	F+	F+
Pittsburgh, PA	L-	L-	L-	S-	S-
Riverside-San Bernardino, CA	H+	H+	H+	F+	F+
Cleveland, OH	L-	L-	L-	S-	S-
Sacramento, CA	H	H+	H	0	F+
Portland, OR-WA	0	H	0	0	0
San Jose, CA	H+	H+	H+	F	F+
Cincinnati, OH-KY-IN	L-	L	L	S	S-
Virginia Beach, VA	L	L	L	S-	S-
Kansas City, MO-KS	L-	L-	L-	S-	S-
Milwaukee, WI	L-	L-	L-	S-	S-
Las Vegas, NV	0	H	L	F	0
Orlando, FL	H+	H	H	F+	F+
San Antonio, TX	0	0	L	F	S
Providence, RI-MA	L-	L-	L-	0	S-
Columbus, OH	L	L	L	F	S-
Buffalo, NY	L-	L-	L-	S-	S-
New Orleans, LA	L-	L-	L-	S-	S-
Indianapolis, IN	H	0	L	0	S-
Memphis, TN-MS-AR	L	L-	L-	0	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
2005 Values 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
1982 to 2005 Trends Delay per Traveler - Total Delay -	5 Hours 5 Hours x Average Population	3 Hours 3 Hours x Average Population

The Mobility Data for New Orleans, LA

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	1,090	1,090	1,090	1,090	1,095	1,090
Rank	37	37	37	37	37	37
Urban Area (square miles)	320	320	315	315	315	315
Popn Density (persons/sq mile)	3,406	3,406	3,460	3,460	3,476	3,460
Peak Travelers (1000s)	602	598	595	586	579	568
Freeway						
Daily Vehicle-Miles of Travel (1000s)	5,700	5,700	5,750	5,700	5,585	5,615
Lane Miles	415	415	425	420	415	415
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	8,200	8,230	8,290	8,280	8,170	8,190
Lane Miles	1,810	1,830	1,840	1,850	1,850	1,850
Public Transportation						
Annual Psgr-Miles of Travel (millions)	130	135	156	142	173	179
Annual Unlinked Psgr Trips (millions)	54	55	61	61	61	63
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)	2.23	1.87	1.46	1.33	1.43	1.49
System Performance						
Congested Travel (% of peak VMT)	44	42	42	42	41	41
Congested System (% of lane-miles)	36	36	35	35	36	36
Congested Time (number of "Rush Hours")	5.6	5.6	5.6	5.6	5.4	5.4
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	3	-1	9	17	17	15
Transit Riders or Carpoolers (millions)	1	0	2	4	4	3
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	6,918	6,649	6,738	6,604	6,526	6,738
Rank	49	49	49	50	49	46
Fuel per Peak Traveler (gallons)	11	11	11	11	11	12
Rank	62	64	64	63	63	60
Annual Delay						
Total Delay (1000s of person-hours)	10,837	10,553	10,794	10,565	10,534	10,845
Rank	49	49	48	49	48	47
Delay per Peak Traveler (person-hrs)	18	18	18	18	18	19
Rank	63	63	61	61	62	60
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index						
Rank	49	49	47	46	44	44
Congestion Cost						
Total Cost (\$ millions)	207	193	190	181	179	180
Rank	49	49	48	48	47	47
Cost per Peak Traveler (\$)	345	322	319	309	309	316
Rank	60	62	60	60	61	57

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 New Orleans, LA, Continued

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	1,090	1,090	1,085	1,085	1,085	1,085
Rank	36	35	34	33	33	33
Urban Area (square miles)	310	315	300	295	290	285
Popn Density (persons/sq mile)	3,516	3,460	3,617	3,678	3,741	3,807
Peak Travelers (1000s)	558	549	538	529	521	513
Freeway						
Daily Vehicle-Miles of Travel (1000s)	5,750	5,745	5,470	5,400	5,590	5,555
Lane Miles	415	410	410	410	405	405
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	8,210	8,035	7,980	7,835	7,780	7,745
Lane Miles	1,850	1,850	1,850	1,850	1,850	1,840
Public Transportation						
Annual Psgr-Miles of Travel (millions)	196	206	177	199	215	220
Annual Unlinked Psgr Trips (millions)	67	70	64	69	79	77
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)	1.08	1.04	1.17	1.22	1.16	1.06
System Performance						
Congested Travel (% of peak VMT)	42	42	42	39	41	40
Congested System (% of lane-miles)	36	36	37	33	33	33
Congested Time (number of "Rush Hours")	5.6	5.6	5.4	5.2	5.4	5.4
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	22	33	26	26	38	46
Transit Riders or Carpoolers (millions)	5	7	5	5	8	10
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	7,373	7,089	6,779	6,343	6,730	6,647
Rank	44	43	43	42	39	37
Fuel per Peak Traveler (gallons)	13	13	13	12	13	13
Rank	58	56	57	55	50	46
Annual Delay						
Total Delay (1000s of person-hours)	11,845	11,353	10,782	10,053	10,650	10,774
Rank	44	42	42	42	39	37
Delay per Peak Traveler (person-hrs)	21	21	20	19	20	21
Rank	59	56	56	56	51	44
Delay due to Incidents (percent)	53	53	53	54	54	54
Travel Time Index						
Rank	42	42	42	41	37	33
Congestion Cost						
Total Cost (\$ millions)	187	175	166	152	156	153
Rank	43	40	42	42	37	36
Cost per Peak Traveler (\$)	335	319	308	286	300	298
Rank	54	53	53	53	48	43

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 New Orleans, LA, Continued

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	1,080	1,075	1,060	1,050	1,045	1,040
Rank	33	33	34	34	34	34
Urban Area (square miles)	280	275	270	270	270	270
Popn Density (persons/sq mile)	3,857	3,909	3,926	3,889	3,870	3,852
Peak Travelers (1000s)	502	492	477	465	460	453
Freeway						
Daily Vehicle-Miles of Travel (1000s)	5,105	5,000	4,900	4,750	4,600	4,450
Lane Miles	405	395	385	375	365	355
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	7,725	7,710	7,600	7,545	7,400	7,205
Lane Miles	1,810	1,780	1,750	1,745	1,740	1,730
Public Transportation						
Annual Psgr-Miles of Travel (millions)	213	216	208	228	205	223
Annual Unlinked Psgr Trips (millions)	71	75	78	85	79	85
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)	1.12	1.12	1.12	1.08	1.09	1.01
System Performance						
Congested Travel (% of peak VMT)	41	41	42	41	37	38
Congested System (% of lane-miles)	34	34	34	34	33	33
Congested Time (number of "Rush Hours")	4.8	5.0	5.0	5.0	4.8	4.8
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	43	41	27	18	19	10
Transit Riders or Carpoolers (millions)	9	8	6	4	4	2
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	5,973	6,045	6,326	5,973	5,104	5,080
Rank	38	34	32	32	31	30
Fuel per Peak Traveler (gallons)	12	12	13	13	11	11
Rank	46	43	35	38	39	35
Annual Delay						
Total Delay (1000s of person-hours)	9,555	9,531	10,085	9,518	8,154	8,242
Rank	37	34	30	30	31	30
Delay per Peak Traveler (person-hrs)	19	19	21	20	18	18
Rank	47	41	36	37	38	32
Delay due to Incidents (percent)	53	53	53	54	54	54
Travel Time Index						
Rank	32	30	23	23	24	21
Congestion Cost						
Total Cost (\$ millions)	132	128	132	121	97	93
Rank	36	34	29	29	30	28
Cost per Peak Traveler (\$)	262	260	278	261	212	206
Rank	46	39	35	35	38	32

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 New Orleans, LA, Continued

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	1,035	1,035	1,030	1,030	1,025	1,020
Rank	32	31	30	30	31	31
Urban Area (square miles)	270	270	270	270	270	270
Popn Density (persons/sq mile)	3,833	3,833	3,815	3,815	3,796	3,778
Peak Travelers (1000s)	448	444	439	436	431	423
Freeway						
Daily Vehicle-Miles of Travel (1000s)	4,360	4,435	4,490	4,335	4,125	4,035
Lane Miles	345	340	340	340	340	330
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	7,215	7,300	7,305	7,125	7,275	6,730
Lane Miles	1,725	1,720	1,710	1,665	1,635	1,605
Public Transportation						
Annual Psgr-Miles of Travel (millions)	216	214	223	225	225	225
Annual Unlinked Psgr Trips (millions)	78	82	80	90	90	90
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)	1.10	0.98	1.29	1.30	1.33	1.39
System Performance						
Congested Travel (% of peak VMT)	39	41	41	41	39	35
Congested System (% of lane-miles)	33	32	32	36	35	31
Congested Time (number of "Rush Hours")	4.8	5.2	5.2	5.0	4.8	4.6
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	30	--	--	--	--	--
Transit Riders or Carpoolers (millions)	6	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	5,131	5,469	5,598	5,338	4,814	4,077
Rank	28	25	21	21	21	22
Fuel per Peak Traveler (gallons)	11	12	13	12	11	10
Rank	33	24	15	15	14	17
Annual Delay						
Total Delay (1000s of person-hours)	8,310	8,687	9,070	8,744	7,997	6,835
Rank	27	26	21	21	21	22
Delay per Peak Traveler (person-hrs)	19	20	21	20	19	16
Rank	29	23	16	15	15	17
Delay due to Incidents (percent)	54	54	54	53	53	53
Travel Time Index						
Rank	18	14	11	10	8	11
Congestion Cost						
Total Cost (\$ millions)	91	92	95	89	78	65
Rank	27	25	21	21	21	23
Cost per Peak Traveler (\$)	204	206	217	204	181	153
Rank	28	23	15	15	14	14

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

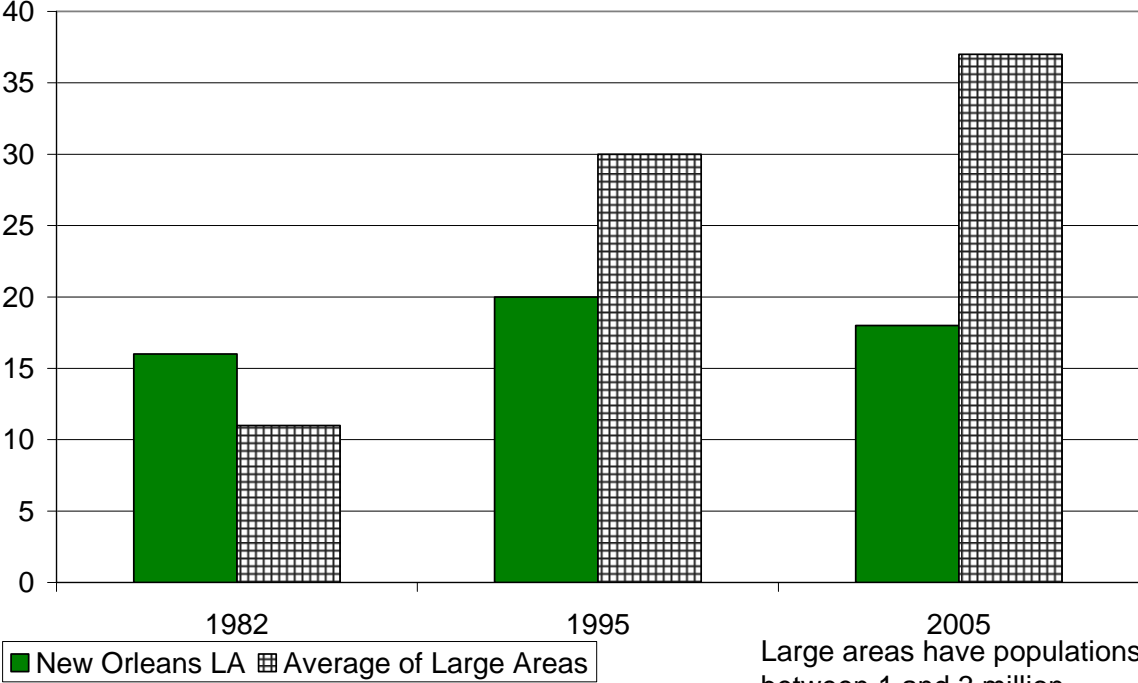
Note: Zeroes in the table reflect values less than 0.5.

Benefits From Public Transportation Service and Operations Strategies for New Orleans, LA

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	--	--	--	--	--	--
Service Patrols						
Percent of Roadway Miles	82	84	66	67	45	23
Annual Delay Reduction (1000 hours)	140	120	121	116	94	57
Arterial Signal Coordination						
Percent of Roadway Miles	30	30	30	30	30	30
Annual Delay Reduction (1000 hours)	18	30	19	18	13	12
Arterial Access Management						
Percent of Roadway Miles	45	45	42	38	35	32
Annual Delay Reduction (1000 hours)	428	438	404	326	386	319
HOV Lanes						
Daily Passenger-miles of Travel (1000s)	--	--	--	--	--	--
HOV User Delay Savings	--	--	--	--	--	--
Total Effect of Operations Treatments						
Annual Delay Reduction (1000 hours)	586	588	544	459	494	388
Annual Delay Saved per Peak Traveler (hours)	1	1	1	1	1	1
Annual Congestion Cost Savings (\$million)	11.1	10.7	9.5	7.9	8.3	6.3
Travel Time Index with Strategies	1.155	1.148	1.149	1.146	1.147	1.152
Travel Time Index (Base)	1.162	1.155	1.155	1.152	1.152	1.156
Public Transportation Service						
Existing Service						
Annual Passenger-miles of Travel (million)	130	135	156	142	173	179
Unlinked Passenger Trips (million)	54	55	61	61	61	63
Travel Time Index (combined road and transit)	1.148	1.141	1.142	1.140	1.139	1.143
Condition if Public Transportation Service were Discontinued						
Travel Time Index	1.173	1.166	1.170	1.163	1.168	1.174
Annual Delay Increase (1000 hours)	1,070	1,077	1,401	1,113	1,442	1,647
Annual Delay Increase per Peak Traveler (hours)	2	2	2	2	2	3
Annual Congestion Cost Increase (\$million)	20.8	20.0	25.1	19.4	24.8	27.6

Growth in Delay per Peak Traveler

Hours of Delay



Growth in Total Delay

Annual Hours of Delay (million)

