

## 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 Small Group – less than 500,000 population urban areas

Urban Area	Delay per Traveler	Travel Time Index	Total Delay	1982 to 2005	
				Delay per Traveler	Total Delay
Colorado Springs, CO	H+	H+	H+	F+	F+
Charleston-North Charleston, SC	H+	H+	H+	F	F+
Bakersfield, CA	L	0	0	0	F+
Columbia, SC	0	L	H	0	F+
Cape Coral, FL	H+	H	H+	F	F+
Little Rock, AR	0	L	0	0	F
Spokane, WA	L-	L-	L-	S-	S-
Pensacola, FL-AL	H+	H	H+	F+	F+
Corpus Christi, TX	L-	L	L	S-	S-
Anchorage, AK	L-	L	L-	S-	S-
Eugene, OR	L	0	L	S-	S-
<b>Beaumont, TX</b>	<b>L-</b>	<b>L</b>	<b>L-</b>	<b>S-</b>	<b>S-</b>
Salem, OR	L	0	L	0	S-
Laredo, TX	L-	0	L-	S	S-
Brownsville, TX	L-	L	L-	S-	S-
Boulder, CO	0	0	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 Beaumont, TX

Inventory Measures	2005	2004	2003	2002	2001	2000
<b>Urban Area Information</b>						
Population (1000s)	225	225	225	220	220	220
Rank	81	81	81	81	81	80
Urban Area (square miles)	190	190	190	190	190	190
Popn Density (persons/sq mile)	1,184	1,184	1,184	1,158	1,158	1,158
Peak Travelers (1000s)	123	122	121	117	115	113
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	2,320	2,260	2,240	2,250	2,140	2,075
Lane Miles	205	205	205	205	205	205
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	2,850	2,745	2,610	2,515	2,440	2,360
Lane Miles	800	785	770	745	720	705
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	4	4	4	6	7	7
Annual Unlinked Psgr Trips (millions)	1	1	1	2	2	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)	2.23	1.83	1.45	1.32	1.46	1.47
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	15	15	14	14	14	12
<b>Congested System</b> (% of lane-miles)	19	19	19	19	19	18
<b>Congested Time</b> (number of "Rush Hours")	3.4	3.2	3.2	3.2	3.0	2.9
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	31	28	28	27	27	31
Transit Riders or Carpoolers (millions)	6	5	5	5	5	5
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	831	788	730	745	641	574
Rank	82	82	82	82	82	82
Fuel per Peak Traveler (gallons)	7	6	6	6	6	5
Rank	76	79	77	76	76	80
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	1,377	1,337	1,231	1,270	1,056	981
Rank	82	82	83	82	82	82
Delay per Peak Traveler (person-hrs)	11	11	10	11	9	9
Rank	77	76	77	75	80	80
Delay due to Incidents (percent)	57	57	57	57	57	56
<b>Travel Time Index</b>						
Rank	84	83	85	82	85	84
<b>Congestion Cost</b>						
Total Cost (\$ millions)	25	23	20	21	17	15
Rank	82	82	83	82	82	82
Cost per Peak Traveler (\$)	202	188	168	177	147	135
Rank	78	79	80	77	82	81

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 Beaumont, TX, 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)	220	220	215	215	215	215
Rank	80	80	80	80	80	80
Urban Area (square miles)	190	190	185	185	185	185
Popn Density (persons/sq mile)	1,158	1,158	1,162	1,162	1,162	1,162
Peak Travelers (1000s)	112	110	106	104	103	101
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	2,120	2,105	2,110	2,050	1,940	1,830
Lane Miles	210	215	215	205	205	200
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	2,230	2,120	2,040	1,905	1,820	1,745
Lane Miles	690	675	650	640	625	600
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	7	6	6	6	7	7
Annual Unlinked Psgr Trips (millions)	2	1	2	2	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)	1.07	1.01	1.12	1.21	1.14	1.03
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	12	9	9	10	8	7
<b>Congested System</b> (% of lane-miles)	18	13	14	14	13	13
<b>Congested Time</b> (number of "Rush Hours")	2.9	2.8	2.8	2.8	2.7	2.7
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	36	37	33	29	28	24
Transit Riders or Carpoolers (millions)	6	6	6	5	4	4
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	558	454	399	407	353	314
Rank	83	83	83	83	83	83
Fuel per Peak Traveler (gallons)	5	4	4	4	3	3
Rank	84	84	84	84	84	83
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	950	810	654	678	633	571
Rank	83	83	84	83	83	83
Delay per Peak Traveler (person-hrs)	9	7	6	7	6	6
Rank	82	82	84	84	84	83
Delay due to Incidents (percent)	56	57	56	55	56	55
<b>Travel Time Index</b>						
Rank	85	85	85	85	85	85
<b>Congestion Cost</b>						
Total Cost (\$ millions)	14	12	9	10	9	8
Rank	82	83	84	83	83	83
Cost per Peak Traveler (\$)	126	107	89	92	85	75
Rank	82	82	84	84	84	83

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 Beaumont, TX, 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)	215	210	210	210	205	205
Rank	80	80	80	80	80	80
Urban Area (square miles)	185	185	185	185	180	180
Popn Density (persons/sq mile)	1,162	1,135	1,135	1,135	1,139	1,139
Peak Travelers (1000s)	100	96	94	93	90	89
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	1,780	1,825	1,780	1,690	1,660	1,600
Lane Miles	195	200	200	200	200	200
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	1,670	1,610	1,550	1,500	1,435	1,430
Lane Miles	565	540	510	485	445	435
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	7	7	6	5	5	5
Annual Unlinked Psgr Trips (millions)	2	2	1	1	1	1
<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)	1.10	1.09	1.12	1.04	1.07	0.99
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	8	9	7	6	6	6
<b>Congested System</b> (% of lane-miles)	12	14	12	9	8	8
<b>Congested Time</b> (number of "Rush Hours")	2.7	2.7	2.6	2.6	2.6	2.5
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	20	22	14	11	11	19
Transit Riders or Carpoolers (millions)	3	4	2	2	2	3
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	338	309	282	230	225	199
Rank	83	83	82	83	82	82
Fuel per Peak Traveler (gallons)	3	3	3	2	3	2
Rank	83	82	82	82	82	82
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	607	508	465	378	372	325
Rank	83	83	83	83	83	82
Delay per Peak Traveler (person-hrs)	6	5	5	4	4	4
Rank	81	82	82	82	82	82
Delay due to Incidents (percent)	56	55	58	58	58	57
<b>Travel Time Index</b>						
Rank	1.03	1.03	1.02	1.02	1.02	1.02
Rank	85	85	85	85	85	85
<b>Congestion Cost</b>						
Total Cost (\$ millions)	8	6	6	5	4	4
Rank	83	83	82	83	82	82
Cost per Peak Traveler (\$)	78	67	62	50	47	39
Rank	82	82	82	82	82	82

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 Beaumont, TX, 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)	205	205	205	205	205	205
Rank	80	80	80	79	79	79
Urban Area (square miles)	180	180	175	175	175	175
Popn Density (persons/sq mile)	1,139	1,139	1,171	1,171	1,171	1,171
Peak Travelers (1000s)	89	88	87	87	86	85
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	1,580	1,640	1,550	1,565	1,515	1,475
Lane Miles	200	200	205	205	205	200
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	1,390	1,370	1,385	1,280	1,110	1,130
Lane Miles	430	425	410	390	350	330
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	6	6	7	7	7	7
Annual Unlinked Psgr Trips (millions)	1	1	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)	0.99	0.97	1.27	1.28	1.31	1.37
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	7	9	8	7	7	7
<b>Congested System</b> (% of lane-miles)	12	15	13	12	11	11
<b>Congested Time</b> (number of "Rush Hours")	2.5	2.5	2.5	2.5	2.4	2.4
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	16	--	--	--	--	--
Transit Riders or Carpoolers (millions)	3	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	211	251	241	215	184	189
Rank	81	80	80	81	80	80
Fuel per Peak Traveler (gallons)	2	3	3	2	2	2
Rank	78	72	71	69	73	71
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	341	378	390	355	302	314
Rank	81	80	80	81	80	80
Delay per Peak Traveler (person-hrs)	4	4	4	4	4	4
Rank	78	74	73	72	73	71
Delay due to Incidents (percent)	56	57	55	55	55	55
<b>Travel Time Index</b>						
Rank	83	77	77	77	77	74
<b>Congestion Cost</b>						
Total Cost (\$ millions)	4	4	4	3	3	3
Rank	81	80	80	81	80	80
Cost per Peak Traveler (\$)	40	44	45	40	33	34
Rank	78	75	72	72	72	71

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

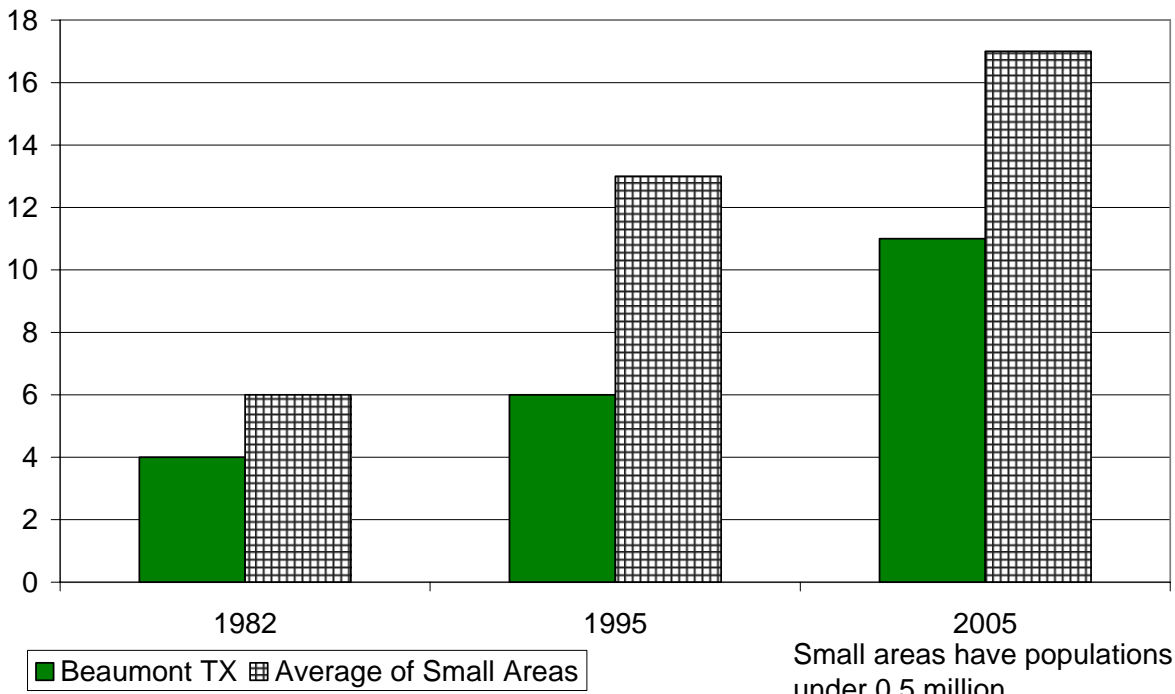
Note: Zeroes in the table reflect values less than 0.5.

## Benefits From Public Transportation Service and Operations Strategies for Beaumont, TX

<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	--	--	--	--	--	--
Annual Delay Reduction (1000 hours)	--	--	--	--	--	--
<b>Arterial Signal Coordination</b>						
Percent of Roadway Miles	44	38	39	33	35	35
Annual Delay Reduction (1000 hours)	3	1	1	6	2	0
<b>Arterial Access Management</b>						
Percent of Roadway Miles	15	15	16	16	17	17
Annual Delay Reduction (1000 hours)	14	15	12	9	12	10
<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)	17	16	13	15	14	11
Annual Delay Saved per Peak Traveler (hours)	0	0	0	0	0	0
Annual Congestion Cost Savings (\$million)	0.3	0.3	0.2	0.2	0.2	0.2
Travel Time Index with Strategies	1.047	1.046	1.044	1.046	1.041	1.038
Travel Time Index (Base)	1.048	1.047	1.045	1.047	1.042	1.038
<b>Public Transportation Service</b>						
<b>Existing Service</b>						
Annual Passenger-miles of Travel (million)	4	4	4	6	7	7
Unlinked Passenger Trips (million)	1	1	1	2	2	2
Travel Time Index (combined road and transit)	1.047	1.046	1.044	1.046	1.041	1.038
<b>Condition if Public Transportation Service were Discontinued</b>						
Travel Time Index	1.048	1.047	1.045	1.048	1.042	1.039
Annual Delay Increase (1000 hours)	10	4	6	36	17	13
Annual Delay Increase per Peak Traveler (hours)	0	0	0	0	0	0
Annual Congestion Cost Increase (\$million)	0.2	0.1	0.1	0.6	0.3	0.2

### Growth in Delay per Peak Traveler

Hours of Delay



### Growth in Total Delay

Annual Hours of Delay (million)

