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-
Beaumont, TX	L-	L	L-	S-	S-
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	
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 Laredo, TX

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	200	200	200	190	190	185
Rank	83	83	83	83	83	83
Urban Area (square miles)	55	55	55	50	50	50
Popn Density (persons/sq mile)	3,636	3,636	3,636	3,800	3,800	3,700
Peak Travelers (1000s)	109	108	108	101	99	95
Freeway						
Daily Vehicle-Miles of Travel (1000s)	485	470	450	470	430	415
Lane Miles	75	75	75	75	75	75
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	1,780	1,725	1,680	1,570	1,575	1,445
Lane Miles	360	355	345	340	335	330
Public Transportation						
Annual Psgr-Miles of Travel (millions)	12	16	22	22	22	21
Annual Unlinked Psgr Trips (millions)	4	4	5	5	5	5
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 ($/gallon)	2.23	1.83	1.45	1.32	1.46	1.47
System Performance						
Congested Travel (% of peak VMT)	25	24	26	23	23	22
Congested System (% of lane-miles)	30	30	34	34	34	34
Congested Time (number of "Rush Hours")	3.2	3.0	3.0	2.9	2.9	2.8
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	17	14	19	24	28	32
Transit Riders or Carpoolers (millions)	3	2	3	4	5	5
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	693	653	687	537	559	486
Rank	83	83	83	84	84	84
Fuel per Peak Traveler (gallons)	6	6	6	5	6	5
Rank	81	79	77	82	76	80
Annual Delay						
Total Delay (1000s of person-hours)	1,262	1,199	1,257	957	1,011	892
Rank	83	83	82	83	83	84
Delay per Peak Traveler (person-hrs)	12	11	12	9	10	9
Rank	76	76	75	81	78	80
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index	1.09	1.09	1.10	1.08	1.08	1.08
Rank	64	65	60	70	70	71
Congestion Cost						
Total Cost ($ millions)	23	21	21	16	17	14
Rank	83	83	82	83	82	83
Cost per Peak Traveler ($)	213	195	199	159	169	151
Rank	76	77	76	81	77	80

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 Laredo, TX, Continued

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	180	175	165	150	145	140
Rank	83	83	83	83	83	83
Urban Area (square miles)	50	50	50	45	45	45
Popn Density (persons/sq mile)	3,600	3,500	3,300	3,333	3,222	3,111
Peak Travelers (1000s)	91	88	81	73	69	66
Freeway						
Daily Vehicle-Miles of Travel (1000s)	430	405	360	370	340	335
Lane Miles	75	70	60	60	60	55
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	1,440	1,300	1,180	1,060	940	820
Lane Miles	325	315	295	255	250	245
Public Transportation						
Annual Psgr-Miles of Travel (millions)	20	17	17	19	19	18
Annual Unlinked Psgr Trips (millions)	5	4	4	5	5	5
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 ($/gallon)	1.07	1.01	1.12	1.21	1.14	1.03
System Performance						
Congested Travel (% of peak VMT)	22	20	22	20	17	13
Congested System (% of lane-miles)	33	34	30	29	25	21
Congested Time (number of "Rush Hours")	2.8	2.7	2.6	2.7	2.5	2.4
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	41	43	43	38	39	36
Transit Riders or Carpoolers (millions)	7	7	7	6	6	5
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	472	414	395	321	249	165
Rank	84	84	84	84	84	84
Fuel per Peak Traveler (gallons)	5	5	5	4	4	3
Rank	82	81	80	80	83	84
Annual Delay						
Total Delay (1000s of person-hours)	836	746	706	561	454	296
Rank	84	84	83	84	84	84
Delay per Peak Traveler (person-hrs)	9	9	9	8	7	5
Rank	79	80	79	78	82	84
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index	1.07	1.07	1.08	1.07	1.06	1.04
Rank	73	72	70	72	71	77
Congestion Cost						
Total Cost ($ millions)	13	11	11	8	6	4
Rank	84	84	83	84	84	84
Cost per Peak Traveler ($)	141	128	130	114	94	62
Rank	80	80	78	78	81	84

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 Laredo, TX, Continued

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	130	125	125	120	120	120
Rank	83	83	83	83	83	83
Urban Area (square miles)	40	35	35	30	30	30
Popn Density (persons/sq mile)	3,250	3,571	3,571	4,000	4,000	4,000
Peak Travelers (1000s)	60	57	56	53	53	52
Freeway						
Daily Vehicle-Miles of Travel (1000s)	300	250	205	165	135	125
Lane Miles	45	35	30	25	20	20
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	700	615	600	545	525	555
Lane Miles	245	240	235	230	225	220
Public Transportation						
Annual Psgr-Miles of Travel (millions)	18	17	8	8	8	8
Annual Unlinked Psgr Trips (millions)	5	4	4	4	3	3
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 ($/gallon)	1.10	1.09	1.12	1.04	1.07	0.99
System Performance						
Congested Travel (% of peak VMT)	12	12	12	10	9	9
Congested System (% of lane-miles)	22	22	23	19	19	14
Congested Time (number of "Rush Hours")	2.3	2.3	2.2	2.1	2.1	2.2
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	24	18	15	7	5	7
Transit Riders or Carpoolers (millions)	3	2	2	1	1	1
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	136	110	106	80	66	72
Rank	84	84	84	85	85	85
Fuel per Peak Traveler (gallons)	2	2	2	2	1	1
Rank	84	84	85	85	85	85
Annual Delay						
Total Delay (1000s of person-hours)	244	192	192	143	118	128
Rank	84	84	84	85	85	85
Delay per Peak Traveler (person-hrs)	4	3	3	3	2	2
Rank	84	84	84	85	85	85
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index	1.04	1.04	1.04	1.03	1.03	1.03
Rank	77	80	76	80	80	76
Congestion Cost						
Total Cost ($ millions)	3	3	2	2	1	1
Rank	84	84	84	85	85	85
Cost per Peak Traveler ($)	55	45	44	34	26	27
Rank	84	84	84	85	85	85

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 Laredo, TX, Continued

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	110	105	100	95	95	95
Rank	83	83	83	83	83	83
Urban Area (square miles)	30	30	30	25	25	25
Popn Density (persons/sq mile)	3,667	3,500	3,333	3,800	3,800	3,800
Peak Travelers (1000s)	48	45	43	40	40	39
Freeway						
Daily Vehicle-Miles of Travel (1000s)	125	125	120	120	120	115
Lane Miles	20	20	20	20	20	20
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	500	485	505	470	475	435
Lane Miles	220	220	215	215	215	215
Public Transportation						
Annual Psgr-Miles of Travel (millions)	8	8	8	8	8	8
Annual Unlinked Psgr Trips (millions)	2	2	3	3	3	3
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 ($/gallon)	0.99	0.97	1.27	1.28	1.31	1.37
System Performance						
Congested Travel (% of peak VMT)	9	9	9	7	7	7
Congested System (% of lane-miles)	14	14	14	14	14	14
Congested Time (number of "Rush Hours")	2.1	2.0	2.1	2.0	2.0	2.0
Annual Increase Needed To Maintain Constant Congestion Level:						
Lane-Miles	7	- -	- -	- -	- -	- -
Transit Riders or Carpoolers (millions)	1	- -	- -	- -	- -	- -
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	59	55	55	45	44	38
Rank	85	85	84	85	85	84
Fuel per Peak Traveler (gallons)	1	1	1	1	1	1
Rank	85	85	84	84	85	85
Annual Delay						
Total Delay (1000s of person-hours)	105	97	93	78	76	66
Rank	85	85	84	85	85	84
Delay per Peak Traveler (person-hrs)	2	2	2	2	2	2
Rank	85	85	83	83	84	85
Delay due to Incidents (percent)	53	53	53	53	53	53
Travel Time Index	1.03	1.03	1.02	1.02	1.02	1.02
Rank	77	75	76	78	75	79
Congestion Cost						
Total Cost ($ millions)	1	1	1	1	1	1
Rank	85	85	84	85	85	84
Cost per Peak Traveler ($)	24	23	23	20	19	16
Rank	85	84	83	83	84	84

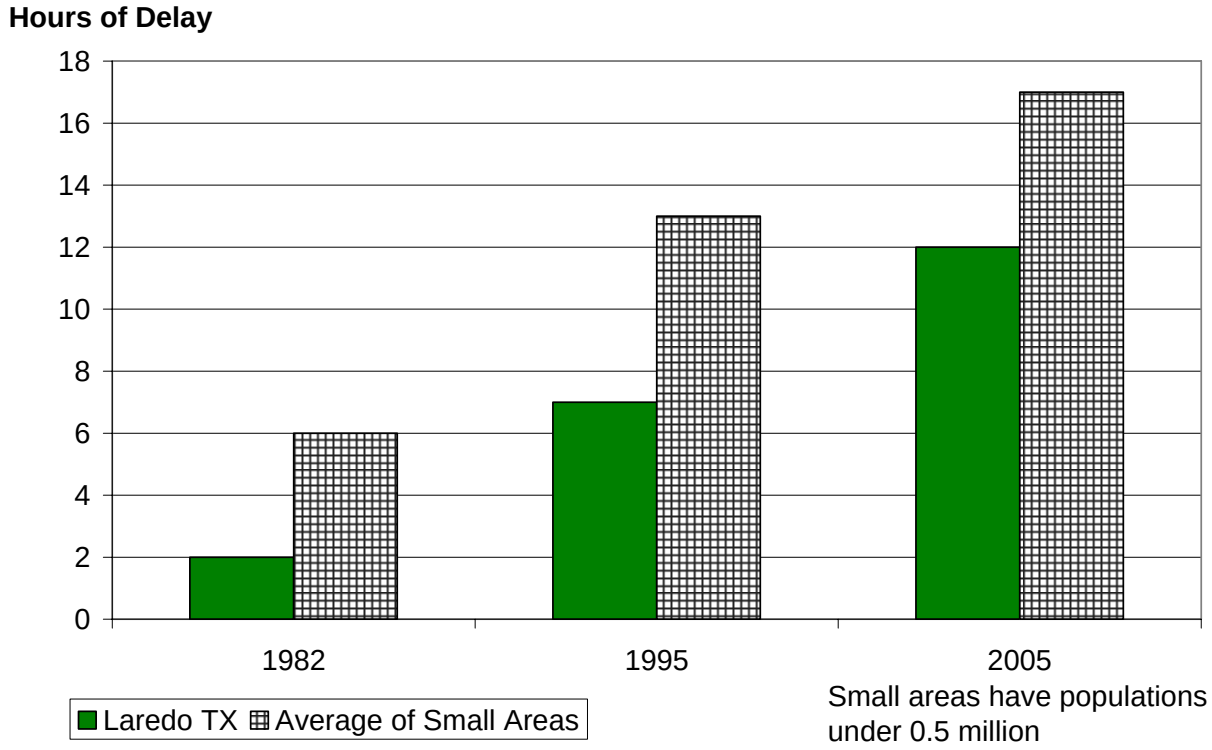
Note: System Performance statistics for 2000 through 2005 data reflect the effects of operational treatments.

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

Benefits From Public Transportation Service and Operations Strategies for Laredo, TX

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	30	31	31	--	--	--
Service Patrols						
Percent of Roadway Miles	--	--	--	--	--	--
Annual Delay Reduction (1000 hours)	0	0	0	--	--	--
Arterial Signal Coordination						
Percent of Roadway Miles	53	51	43	44	33	33
Annual Delay Reduction (1000 hours)	13	15	9	20	12	12
Arterial Access Management						
Percent of Roadway Miles	19	17	16	15	12	12
Annual Delay Reduction (1000 hours)	13	11	13	2	--	--
HOV Lanes						
Daily Passenger-miles of Travel (1000s)	--	--	--	--	--	--
HOV User Delay Savings	--	--	--	--	--	--
Total Effect of Operations Treatments						
Annual Delay Reduction (1000 hours)	26	26	21	22	12	12
Annual Delay Saved per Peak Traveler (hours)	0	0	0	0	0	0
Annual Congestion Cost Savings ($million)	0.5	0.5	0.4	0.4	0.2	0.2
Travel Time Index with Strategies	1.092	1.089	1.097	1.078	1.083	1.078
Travel Time Index (Base)	1.094	1.091	1.099	1.080	1.084	1.079
Public Transportation Service						
Existing Service						
Annual Passenger-miles of Travel (million)	12	16	22	22	22	21
Unlinked Passenger Trips (million)	4	4	5	5	5	5
Travel Time Index (combined road and transit)	1.090	1.087	1.093	1.075	1.080	1.074
Condition if Public Transportation Service were Discontinued						
Travel Time Index	1.096	1.095	1.104	1.084	1.088	1.082
Annual Delay Increase (1000 hours)	61	81	109	84	81	73
Annual Delay Increase per Peak Traveler (hours)	1	1	1	1	1	1
Annual Congestion Cost Increase ($million)	1.1	1.4	1.9	1.4	1.3	1.2

Growth in Delay per Peak Traveler



Growth in Total Delay