

Performance Measure Summary – Dallas-Fort Worth-Arlington, TX

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2007. 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. 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*).

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 2007 (estimated at \$15.47 per hour of person travel and \$102.12 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.

The Mobility Data for Dallas-Fort Worth-Arlington TX

Inventory Measures	2007	2006	2005	2004	2003	2002
Urban Area Information						
Population (1000s)	4,445	4,445	4,440	4,400	4,300	4,200
Rank	7	7	6	6	6	6
Urban Area (square miles)	2,300	2,300	2,300	2,300	2,140	2,000
Population Density (persons/sq mile)	1,933	1,933	1,930	1,913	2,009	2,100
Peak Travelers (1000s)	2,645	2,640	2,624	2,587	2,516	2,440
Freeway						
Daily Vehicle-Miles of Travel (1000s)	55,300	56,000	56,500	54,180	52,870	50,000
Lane-Miles	3,180	3,160	3,150	3,140	3,105	3,085
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	46,090	45,680	45,750	44,805	42,970	42,240
Lane-Miles	8,280	8,265	8,260	8,210	8,110	8,025
Public Transportation						
Annual Psgr-Miles of Travel (millions)	505	502	486	436	468	443
Annual Unlinked Psgr Trips (millions)	82	86	82	86	86	81
Cost Components						
Value of Time (\$/hour)	15.47	15.06	14.58	14.10	13.73	13.43
Commercial Cost (\$/hour)	102.12	98.77	94.06	86.24	82.38	79.96
Fuel Cost (\$/gallon)	2.92	2.55	2.23	1.83	1.45	1.32
System Performance	2007	2006	2005	2004	2003	2002
Congested Travel (% of peak VMT)	66	67	65	64	61	58
Congested System (% of lane-miles)	43	43	43	43	42	41
Congested Time (number of "Rush Hours")	7.4	7.6	7.6	7.4	7.4	7.2
Annual Increase Needed to Maintain Constant Congestion Level:						
Lane-miles	219	245	289	297	325	273
Transit Riders or Carpoolers (millions)	67	76	90	90	96	79
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	96,477	99,048	96,319	88,609	78,035	70,904
Rank	5	6	6	6	10	10
Fuel per Peak Traveler (gallons)	36	38	37	34	31	29
Rank	8	8	7	10	11	14
Annual Delay						
Total Delay (1000s of person-hours)	140,744	144,697	139,289	129,608	114,337	105,964
Rank	5	5	5	5	9	10
Delay per Peak Traveler (person-hours)	53	55	53	50	45	43
Rank	6	6	8	10	13	14
Delay due to Incidents (percent)	55	55	55	55	54	54
Travel Time Index	1.32	1.33	1.32	1.30	1.27	1.25
Rank	12	12	12	14	21	23
Congestion Cost						
Total Cost (\$ millions)	2,849	2,806	2,578	2,265	1,926	1,737
Rank	6	6	6	7	9	10
Cost per Peak Traveler (\$)	1,077	1,063	982	875	766	712
Rank	9	9	10	10	15	19

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

The Mobility Data for Dallas-Fort Worth-Arlington TX, Continued

Inventory Measures	2001	2000	1999	1998	1997
Urban Area Information					
Population (1000s)	4,090	4,000	3,970	3,860	3,740
Rank	6	8	8	9	9
Urban Area (square miles)	1,900	1,860	1,835	1,810	1,790
Population Density (persons/sq mile)	2,153	2,151	2,163	2,133	2,089
Peak Travelers (1000s)	2,335	2,244	2,191	2,096	1,993
Freeway					
Daily Vehicle-Miles of Travel (1000s)	49,300	48,000	46,285	45,740	44,165
Lane-Miles	3,070	3,060	3,055	3,050	3,040
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	42,150	42,265	40,695	37,345	37,530
Lane-Miles	7,980	7,960	7,940	7,920	7,910
Public Transportation					
Annual Psgr-Miles of Travel (millions)	467	372	369	337	348
Annual Unlinked Psgr Trips (millions)	85	74	74	67	66
Cost Components					
Value of Time (\$/hour)	13.22	12.85	12.43	12.17	11.98
Commercial Cost (\$/hour)	80.88	80.75	74.23	72.61	74.32
Fuel Cost (\$/gallon)	1.46	1.47	1.07	1.01	1.12
System Performance	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)	55	52	50	49	43
Congested System (% of lane-miles)	37	36	36	36	31
Congested Time (number of "Rush Hours")	7.2	7.2	6.8	6.6	6.2
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	383	388	325	334	384
Transit Riders or Carpoolers (millions)	110	110	89	88	100
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	66,004	63,523	58,124	50,704	44,319
Rank	10	9	9	9	11
Fuel per Peak Traveler (gallons)	28	28	27	24	22
Rank	16	15	15	18	24
Annual Delay					
Total Delay (1000s of person-hours)	98,666	96,425	88,542	75,209	66,979
Rank	10	9	9	9	10
Delay per Peak Traveler (person-hours)	42	43	40	36	34
Rank	16	14	14	18	25
Delay due to Incidents (percent)	54	54	54	53	53
Travel Time Index					
	1.23	1.23	1.21	1.19	1.17
Rank	25	23	25	27	36
Congestion Cost					
Total Cost (\$ millions)	1,612	1,537	1,332	1,106	981
Rank	10	9	9	10	11
Cost per Peak Traveler (\$)	690	685	608	528	492
Rank	16	16	17	22	30

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

The Mobility Data for Dallas-Fort Worth-Arlington TX, Continued

Inventory Measures	1996	1995	1994	1993	1992
Urban Area Information					
Population (1000s)	3,650	3,500	3,425	3,370	3,325
Rank	9	10	10	10	9
Urban Area (square miles)	1,770	1,755	1,730	1,710	1,680
Population Density (persons/sq mile)	2,062	1,994	1,980	1,971	1,979
Peak Travelers (1000s)	1,916	1,806	1,736	1,682	1,629
Freeway					
Daily Vehicle-Miles of Travel (1000s)	41,900	40,840	40,365	38,500	37,240
Lane-Miles	3,030	2,990	2,955	2,820	2,700
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	35,215	35,095	34,815	33,035	31,520
Lane-Miles	7,705	7,650	7,615	7,340	7,250
Public Transportation					
Annual Psgr-Miles of Travel (millions)	325	273	285	283	285
Annual Unlinked Psgr Trips (millions)	64	58	60	62	62
Cost Components					
Value of Time (\$/hour)	11.71	11.37	11.06	10.78	10.47
Commercial Cost (\$/hour)	74.17	71.54	69.53	67.77	66.19
Fuel Cost (\$/gallon)	1.21	1.14	1.03	1.10	1.09
System Performance	1996	1995	1994	1993	1992
Congested Travel (% of peak VMT)	41	38	37	36	35
Congested System (% of lane-miles)	31	29	26	26	22
Congested Time (number of "Rush Hours")	5.8	5.8	5.8	5.6	5.6
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	332	381	518	480	478
Transit Riders or Carpoolers (millions)	83	94	128	117	115
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	40,013	37,783	35,700	33,816	30,516
Rank	11	10	10	10	13
Fuel per Peak Traveler (gallons)	21	21	21	20	19
Rank	26	21	17	17	18
Annual Delay					
Total Delay (1000s of person-hours)	61,478	59,319	55,938	52,945	47,107
Rank	9	10	10	10	12
Delay per Peak Traveler (person-hours)	32	33	32	31	29
Rank	25	19	19	17	18
Delay due to Incidents (percent)	54	54	55	55	55
Travel Time Index					
	1.16	1.16	1.15	1.15	1.14
Rank	36	31	32	30	30
Congestion Cost					
Total Cost (\$ millions)	885	825	754	700	610
Rank	10	10	11	11	12
Cost per Peak Traveler (\$)	462	457	434	416	374
Rank	29	25	25	21	23

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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The Mobility Data for Dallas-Fort Worth-Arlington TX, Continued

Inventory Measures	1991	1990	1989	1988	1987
Urban Area Information					
Population (1000s)	3,290	3,250	3,175	3,100	3,010
Rank	9	9	9	9	9
Urban Area (square miles)	1,640	1,595	1,555	1,530	1,485
Population Density (persons/sq mile)	2,006	2,038	2,042	2,026	2,027
Peak Travelers (1000s)	1,586	1,541	1,492	1,445	1,391
Freeway					
Daily Vehicle-Miles of Travel (1000s)	36,200	35,700	33,200	32,770	32,360
Lane-Miles	2,615	2,575	2,515	2,470	2,415
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	30,040	27,980	25,990	24,030	22,025
Lane-Miles	7,105	6,910	6,675	6,480	5,295
Public Transportation					
Annual Psgr-Miles of Travel (millions)	329	229	209	230	250
Annual Unlinked Psgr Trips (millions)	64	51	48	51	52
Cost Components					
Value of Time (\$/hour)	10.17	9.75	9.25	8.83	8.48
Commercial Cost (\$/hour)	64.55	62.47	59.16	56.03	54.62
Fuel Cost (\$/gallon)	1.12	1.04	1.07	0.99	0.99
System Performance	1991	1990	1989	1988	1987
Congested Travel (% of peak VMT)	35	33	29	29	31
Congested System (% of lane-miles)	22	18	17	17	18
Congested Time (number of "Rush Hours")	5.6	5.6	5.2	5.2	5.4
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	547	523	497	514	459
Transit Riders or Carpoolers (millions)	130	122	111	113	112
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	28,574	25,676	20,630	20,453	20,639
Rank	12	13	15	15	12
Fuel per Peak Traveler (gallons)	18	17	14	14	15
Rank	20	21	24	23	16
Annual Delay					
Total Delay (1000s of person-hours)	42,868	38,229	31,198	31,017	31,694
Rank	12	13	15	14	12
Delay per Peak Traveler (person-hours)	27	25	21	21	23
Rank	20	24	28	25	19
Delay due to Incidents (percent)	55	55	55	56	56
Travel Time Index	1.13	1.13	1.11	1.11	1.12
Rank	29	27	33	30	22
Congestion Cost					
Total Cost (\$ millions)	542	465	362	343	336
Rank	13	14	16	15	12
Cost per Peak Traveler (\$)	342	302	243	238	242
Rank	22	28	29	28	22

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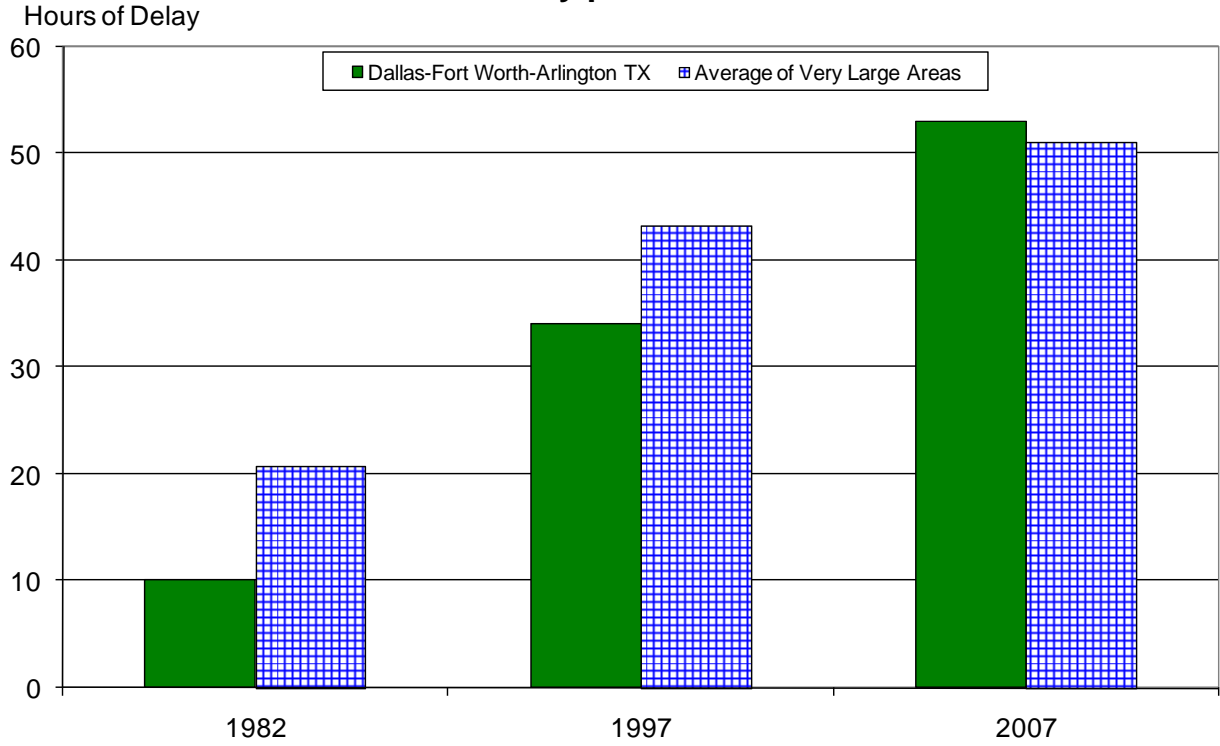
The Mobility Data for Dallas-Fort Worth-Arlington TX, Continued

Inventory Measures	1986	1985	1984	1983	1982
Urban Area Information					
Population (1000s)	2,900	2,750	2,640	2,520	2,450
Rank	10	10	10	10	10
Urban Area (square miles)	1,465	1,450	1,425	1,405	1,395
Population Density (persons/sq mile)	1,980	1,897	1,853	1,794	1,756
Peak Travelers (1000s)	1,328	1,249	1,191	1,126	1,085
Freeway					
Daily Vehicle-Miles of Travel (1000s)	30,000	28,975	26,920	25,040	23,000
Lane-Miles	2,405	2,390	2,375	2,345	2,265
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	20,355	19,710	18,565	17,930	17,735
Lane-Miles	6,155	6,035	5,785	5,600	5,410
Public Transportation					
Annual Psgr-Miles of Travel (millions)	300	278	30	30	30
Annual Unlinked Psgr Trips (millions)	54	52	5	5	5
Cost Components					
Value of Time (\$/hour)	8.18	8.03	7.75	7.43	7.20
Commercial Cost (\$/hour)	52.63	55.80	54.65	52.70	52.13
Fuel Cost (\$/gallon)	0.97	1.27	1.28	1.31	1.37
System Performance	1986	1985	1984	1983	1982
Congested Travel (% of peak VMT)	26	23	19	15	15
Congested System (% of lane-miles)	17	16	14	13	13
Congested Time (number of "Rush Hours")	4.4	4.0	3.4	3.0	2.9
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	--	--	--	--	--
Transit Riders or Carpoolers (millions)	--	--	--	--	--
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	16,030	13,352	10,529	7,707	7,027
Rank	13	13	14	16	15
Fuel per Peak Traveler (gallons)	12	11	9	7	6
Rank	22	22	27	33	36
Annual Delay					
Total Delay (1000s of person-hours)	24,817	20,860	16,686	11,776	10,881
Rank	12	14	15	15	15
Delay per Peak Traveler (person-hours)	19	17	14	10	10
Rank	24	28	31	43	38
Delay due to Incidents (percent)	56	56	56	56	56
Travel Time Index					
	1.10	1.08	1.07	1.05	1.05
Rank	24	35	34	44	44
Congestion Cost					
Total Cost (\$ millions)	253	216	168	115	105
Rank	13	14	14	16	15
Cost per Peak Traveler (\$)	191	173	141	102	96
Rank	28	31	34	44	43

Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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

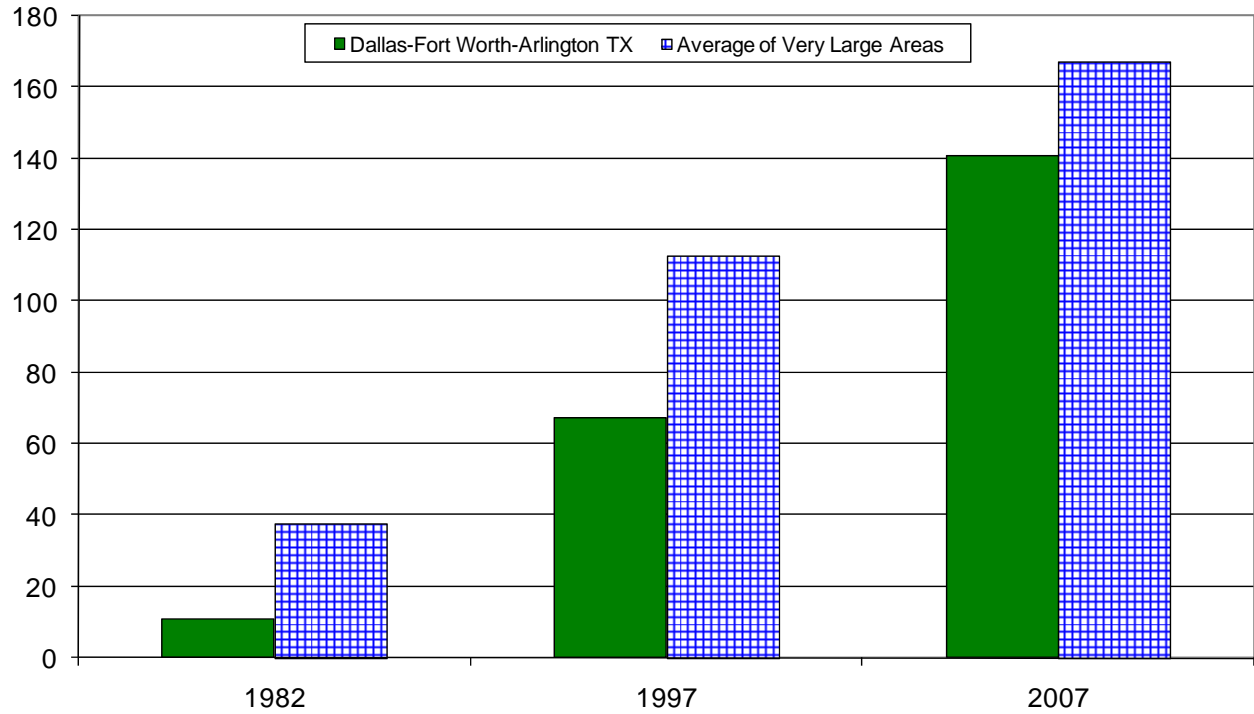
Growth in Delay per Peak Traveler



Note: Very Large areas have populations over 3 million

Annual Hours of Delay (millions)

Growth in Total Delay



Note: Very Large areas have populations over 3 million

**Benefits from Public Transportation Service and Operations Strategies in
Dallas-Fort Worth-Arlington TX**

Operations Strategies	2007	2006	2005	2004
Freeway Ramp Metering				
Percent of Roadway Miles	2	2	2	2
Annual Delay Reduction (1000 hours)	189	200	208	184
Freeway Incident Management				
Cameras				
Percent of Roadway Miles	40	40	39	29
Service Patrols				
Percent of Roadway Miles	74	75	74	70
Annual Delay Reduction (1000 hours)	6,302	6,675	6,577	5,291
Arterial Signal Coordination				
Percent of Roadway Miles	92	92	93	89
Annual Delay Reduction (1000 hours)	401	390	310	283
Arterial Access Management				
Percent of Roadway Miles	73	73	73	67
Annual Delay Reduction (1000 hours)	3,639	3,688	3,338	2,275
HOV Lanes				
Daily Passenger-miles of travel (1000s)	381	369	358	347
HOV User Delay Savings	655	653	631	546
Total Effect of Operations Treatments				
Annual Delay Reduction (1000 hours)	11,187	11,606	11,065	8,579
Annual Delay Saved per Peak Traveler (hours)	4	4	4	3
Annual Congestion Cost Savings (\$million)	221.8	220.7	201.1	148.1
Travel Time Index with Strategies	1.320	1.328	1.317	1.298
Travel Time Index (Base)	1.341	1.350	1.338	1.315
Public Transportation Service	2007	2006	2005	2004
Existing Service				
Annual Passenger-miles of travel (million)	504	502	486	436
Unlinked Passenger Trips (million)	82	86	82	86
Travel Time Index (combined road and transit)	1.335	1.344	1.332	1.311
Condition if Public Transportation Service were Discontinued				
Travel Time Index	1.348	1.358	1.345	1.320
Annual Increase				
Delay (1000 hours)	5,486	5,759	5,263	4,069
Delay per Peak Traveler (hours)	2	2	2	2
Congestion Cost (\$million)	111.1	111.7	97.4	70.9

**Benefits from Public Transportation Service and Operations Strategies in
Dallas-Fort Worth-Arlington TX, Continued**

Operations Strategies	2003	2002	2001	2000
Freeway Ramp Metering				
Percent of Roadway Miles	2	1	1	1
Annual Delay Reduction (1000 hours)	53	48	14	--
Freeway Incident Management				
Cameras				
Percent of Roadway Miles	26	21	18	16
Service Patrols				
Percent of Roadway Miles	70	68	68	69
Annual Delay Reduction (1000 hours)	4,059	3,431	3,184	3,060
Arterial Signal Coordination				
Percent of Roadway Miles	88	81	78	74
Annual Delay Reduction (1000 hours)	275	277	180	207
Arterial Access Management				
Percent of Roadway Miles	68	62	56	53
Annual Delay Reduction (1000 hours)	3,073	3,071	2,351	2,252
HOV Lanes				
Daily Passenger-miles of travel (1000s)	337	326	317	307
HOV User Delay Savings	437	371	329	291
Total Effect of Operations Treatments				
Annual Delay Reduction (1000 hours)	7,895	7,199	6,057	5,810
Annual Delay Saved per Peak Traveler (hours)	3	3	3	3
Annual Congestion Cost Savings (\$million)	131.3	116.5	97.8	91.5
Travel Time Index with Strategies	1.268	1.251	1.234	1.227
Travel Time Index (Base)	1.283	1.264	1.246	1.238
Public Transportation Service	2003	2002	2001	2000
Existing Service				
Annual Passenger-miles of travel (million)	468	443	467	372
Unlinked Passenger Trips (million)	86	81	85	74
Travel Time Index (combined road and transit)	1.278	1.260	1.241	1.235
Condition if Public Transportation Service were Discontinued				
Travel Time Index	1.289	1.269	1.250	1.242
Annual Increase				
Delay (1000 hours)	4,368	3,769	3,620	2,849
Delay per Peak Traveler (hours)	2	2	2	1
Congestion Cost (\$million)	73.3	61.2	58.4	44.5

**Comparison of Several Key Mobility Performance Measures
Very Large Group – over 3 million population urban areas**

Urban Area	Delay per Traveler	Travel Time Index	Total Delay	1982 to 2007	
				Delay per Traveler	Total Delay
New York-Newark, NY-NJ-CT	L	0	H+	0	F+
Los Angeles-Long Beach-Santa Ana, CA	H+	H+	H+	S	F+
Chicago, IL-IN	L-	H	H	S	F+
Miami FL	L	0	L	0	S
Philadelphia, PA-NJ-DE-MD	L-	L-	L-	S-	S-
San Francisco-Oakland, CA	H	H	L	0	S-
Dallas-Fort Worth-Arlington, TX	0	L	L	F+	0
Atlanta, GA	H	0	L	F+	S
Washington, DC-VA-MD	H+	0	L	F+	S-
Boston, MA-NH-RI	L-	L-	L-	0	S-
Detroit, MI	0	L-	L-	0	S-
Houston, TX	H	L	L	S	S-
Phoenix, AZ	L	L	L-	S-	S-
Seattle, WA	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

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
2007 Values Delay per Traveler - Travel Time Index - Total Delay -	Above 1M Population 5 Hours 5 Index Points 5 Hours x Average Population	Below 1M Population 3 Hours 3 Index Points 3 Hours x Average Population
1982 to 2007 Trends Delay per Traveler - Total Delay -	5 Hours 5 Hours x Average Population	3 Hours 3 Hours x Average Population