

## Performance Measure Summary – Brownsville, 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 Brownsville TX

Inventory Measures	2007	2006	2005	2004	2003	2002
<b>Urban Area Information</b>						
Population (1000s)	195	190	185	180	175	175
Rank	89	89	89	89	89	89
Urban Area (square miles)	70	65	65	65	60	60
Population Density (persons/sq mile)	2,786	2,923	2,846	2,769	2,917	2,917
Peak Travelers (1000s)	108	104	101	98	94	93
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	665	600	590	580	505	450
Lane-Miles	60	60	60	50	45	40
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	1,300	1,280	1,200	1,160	1,140	1,125
Lane-Miles	280	280	270	270	270	260
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	15.7	16.5	14.3	13.8	13.7	14.8
Annual Unlinked Psgr Trips (millions)	1.8	1.9	1.7	1.6	1.6	1.7
<b>Cost Components</b>						
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
<b>Congested Travel</b> (% of peak VMT)	22	20	19	20	19	20
<b>Congested System</b> (% of lane-miles)	26	26	25	30	31	31
<b>Congested Time</b> (number of "Rush Hours")	4.4	3.8	3.6	4.4	4.0	4.2
<b>Annual Increase Needed to Maintain Constant Congestion Level:</b>						
Lane-miles	16	18	18	19	19	19
Transit Riders or Carpoolers (millions)	3	3	3	4	3	3
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	487	434	393	387	361	351
Rank	90	90	90	90	90	90
Fuel per Peak Traveler (gallons)	5	4	4	4	4	4
Rank	86	88	88	88	88	88
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	841	764	698	679	639	606
Rank	90	90	90	90	90	90
Delay per Peak Traveler (person-hours)	8	7	7	7	7	7
Rank	88	88	88	88	88	88
Delay due to Incidents (percent)	53	53	53	53	53	53
<b>Travel Time Index</b>	1.07	1.07	1.06	1.07	1.06	1.07
Rank	80	83	84	81	83	78
<b>Congestion Cost</b>						
Total Cost (\$ millions)	17	15	13	12	11	10
Rank	90	90	90	90	90	90
Cost per Peak Traveler (\$)	161	145	131	126	119	110
Rank	88	88	88	88	88	88

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 Brownsville TX, Continued

Inventory Measures	2001	2000	1999	1998	1997
<b>Urban Area Information</b>					
Population (1000s)	175	170	165	160	160
Rank	89	89	89	89	89
Urban Area (square miles)	60	55	50	45	45
Population Density (persons/sq mile)	2,917	3,091	3,300	3,556	3,556
Peak Travelers (1000s)	92	88	84	80	79
<b>Freeway</b>					
Daily Vehicle-Miles of Travel (1000s)	375	325	300	280	260
Lane-Miles	35	30	30	30	30
<b>Arterial Streets</b>					
Daily Vehicle-Miles of Travel (1000s)	1,075	1,040	1,000	950	900
Lane-Miles	250	245	240	235	230
<b>Public Transportation</b>					
Annual Psgr-Miles of Travel (millions)	14.1	14.1	14.3	13.5	16.7
Annual Unlinked Psgr Trips (millions)	1.6	1.6	1.6	1.5	1.5
<b>Cost Components</b>					
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
<b>Congested Travel</b> (% of peak VMT)	20	19	17	16	15
<b>Congested System</b> (% of lane-miles)	31	27	27	27	27
<b>Congested Time</b> (number of "Rush Hours")	4.0	4.0	3.4	3.0	2.9
<b>Annual Increase Needed to Maintain Constant Congestion Level:</b>					
Lane-miles	15	13	14	12	12
Transit Riders or Carpoolers (millions)	3	2	2	2	2
<b>Annual Excess Fuel Consumed</b>					
Total Fuel (1000 gallons)	329	288	248	213	191
Rank	90	90	90	90	90
Fuel per Peak Traveler (gallons)	4	3	3	3	2
Rank	88	88	88	88	90
<b>Annual Delay</b>					
Total Delay (1000s of person-hours)	575	510	433	370	332
Rank	90	90	90	90	90
Delay per Peak Traveler (person-hours)	6	6	5	5	4
Rank	88	88	88	88	90
Delay due to Incidents (percent)	53	53	53	53	53
<b>Travel Time Index</b>	1.07	1.06	1.06	1.05	1.05
Rank	76	79	77	81	79
<b>Congestion Cost</b>					
Total Cost (\$ millions)	10	8	7	6	5
Rank	90	90	90	90	90
Cost per Peak Traveler (\$)	105	95	79	69	63
Rank	88	88	88	90	90

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 Brownsville TX, Continued

Inventory Measures	1996	1995	1994	1993	1992
<b>Urban Area Information</b>					
Population (1000s)	150	145	135	130	125
Rank	88	88	89	88	88
Urban Area (square miles)	45	45	40	40	40
Population Density (persons/sq mile)	3,333	3,222	3,375	3,250	3,125
Peak Travelers (1000s)	73	69	63	60	57
<b>Freeway</b>					
Daily Vehicle-Miles of Travel (1000s)	250	245	240	270	245
Lane-Miles	30	30	30	30	30
<b>Arterial Streets</b>					
Daily Vehicle-Miles of Travel (1000s)	875	840	775	705	680
Lane-Miles	220	215	210	200	195
<b>Public Transportation</b>					
Annual Psgr-Miles of Travel (millions)	19.3	17.5	19.2	14.9	15.0
Annual Unlinked Psgr Trips (millions)	1.7	1.6	1.7	1.8	1.8
<b>Cost Components</b>					
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
<b>Congested Travel</b> (% of peak VMT)	13	13	12	10	10
<b>Congested System</b> (% of lane-miles)	23	23	23	18	18
<b>Congested Time</b> (number of "Rush Hours")	2.9	2.9	2.8	2.8	2.7
<b>Annual Increase Needed to Maintain Constant Congestion Level:</b>					
Lane-miles	12	10	9	9	9
Transit Riders or Carpoolers (millions)	2	2	1	1	1
<b>Annual Excess Fuel Consumed</b>					
Total Fuel (1000 gallons)	164	153	133	108	99
Rank	90	90	90	90	90
Fuel per Peak Traveler (gallons)	2	2	2	2	2
Rank	89	89	89	89	88
<b>Annual Delay</b>					
Total Delay (1000s of person-hours)	288	266	230	188	172
Rank	90	90	90	90	90
Delay per Peak Traveler (person-hours)	4	4	4	3	3
Rank	89	89	89	90	89
Delay due to Incidents (percent)	53	53	53	53	53
<b>Travel Time Index</b>	1.04	1.04	1.04	1.03	1.03
Rank	82	81	80	87	85
<b>Congestion Cost</b>					
Total Cost (\$ millions)	4	4	3	3	2
Rank	90	90	90	89	90
Cost per Peak Traveler (\$)	59	56	51	43	40
Rank	89	90	90	90	90

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 Brownsville TX, Continued

Inventory Measures	1991	1990	1989	1988	1987
<b>Urban Area Information</b>					
Population (1000s)	120	115	115	110	110
Rank	90	90	90	90	89
Urban Area (square miles)	40	40	35	35	35
Population Density (persons/sq mile)	3,000	2,875	3,286	3,143	3,143
Peak Travelers (1000s)	54	51	50	48	48
<b>Freeway</b>					
Daily Vehicle-Miles of Travel (1000s)	230	235	225	210	195
Lane-Miles	30	30	30	30	30
<b>Arterial Streets</b>					
Daily Vehicle-Miles of Travel (1000s)	660	640	620	590	570
Lane-Miles	190	185	175	170	170
<b>Public Transportation</b>					
Annual Psgr-Miles of Travel (millions)	13.0	12.0	11.0	10.0	9.0
Annual Unlinked Psgr Trips (millions)	1.7	1.7	1.7	1.7	2.2
<b>Cost Components</b>					
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
<b>Congested Travel</b> (% of peak VMT)	10	10	10	9	8
<b>Congested System</b> (% of lane-miles)	18	18	18	18	14
<b>Congested Time</b> (number of "Rush Hours")	2.6	2.6	2.6	2.5	2.4
<b>Annual Increase Needed to Maintain Constant Congestion Level:</b>					
Lane-miles	9	10	9	8	11
Transit Riders or Carpoolers (millions)	1	1	1	1	1
<b>Annual Excess Fuel Consumed</b>					
Total Fuel (1000 gallons)	94	93	91	81	64
Rank	90	89	89	89	89
Fuel per Peak Traveler (gallons)	2	2	2	2	1
Rank	87	86	87	84	89
<b>Annual Delay</b>					
Total Delay (1000s of person-hours)	163	164	162	144	115
Rank	90	89	89	89	89
Delay per Peak Traveler (person-hours)	3	3	3	3	2
Rank	88	88	87	87	89
Delay due to Incidents (percent)	53	53	53	53	53
<b>Travel Time Index</b>	1.03	1.03	1.03	1.03	1.02
Rank	85	80	79	75	83
<b>Congestion Cost</b>					
Total Cost (\$ millions)	2	2	2	2	1
Rank	90	89	89	89	89
Cost per Peak Traveler (\$)	40	41	38	34	27
Rank	90	88	87	87	89

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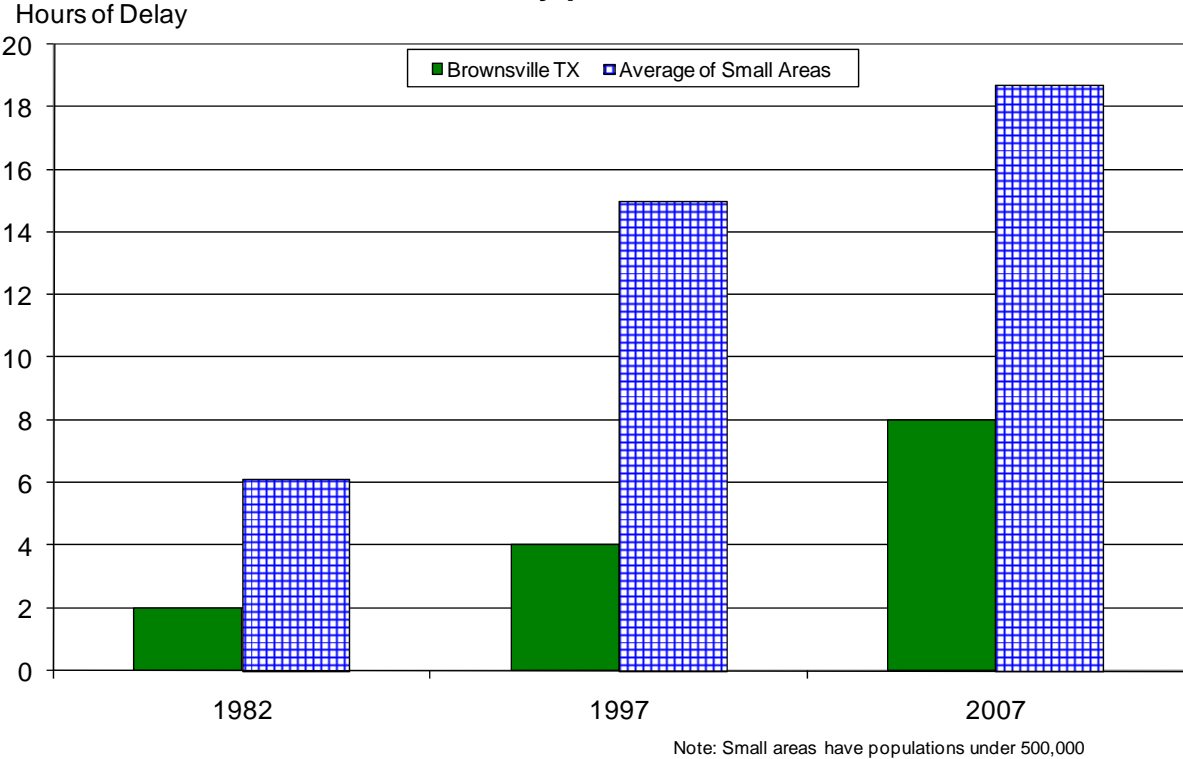
## The Mobility Data for Brownsville TX, Continued

Inventory Measures	1986	1985	1984	1983	1982
<b>Urban Area Information</b>					
Population (1000s)	105	105	105	100	100
Rank	89	88	88	88	88
Urban Area (square miles)	35	35	30	30	30
Population Density (persons/sq mile)	3,000	3,000	3,500	3,333	3,333
Peak Travelers (1000s)	45	45	44	42	41
<b>Freeway</b>					
Daily Vehicle-Miles of Travel (1000s)	175	140	135	125	110
Lane-Miles	30	30	25	20	20
<b>Arterial Streets</b>					
Daily Vehicle-Miles of Travel (1000s)	550	550	540	525	480
Lane-Miles	165	165	160	160	155
<b>Public Transportation</b>					
Annual Psgr-Miles of Travel (millions)	8.0	6.1	5.9	5.9	5.9
Annual Unlinked Psgr Trips (millions)	2.1	2.3	2.2	2.2	2.2
<b>Cost Components</b>					
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
<b>Congested Travel</b> (% of peak VMT)	7	6	6	7	6
<b>Congested System</b> (% of lane-miles)	13	9	9	9	9
<b>Congested Time</b> (number of "Rush Hours")	2.4	2.3	2.4	2.5	2.3
<b>Annual Increase Needed to Maintain Constant Congestion Level:</b>					
Lane-miles	--	--	--	--	--
Transit Riders or Carpoolers (millions)	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>					
Total Fuel (1000 gallons)	59	45	43	45	37
Rank	89	90	90	89	90
Fuel per Peak Traveler (gallons)	1	1	1	1	1
Rank	87	87	85	84	84
<b>Annual Delay</b>					
Total Delay (1000s of person-hours)	106	81	73	79	64
Rank	89	90	90	89	90
Delay per Peak Traveler (person-hours)	2	2	2	2	2
Rank	88	87	85	85	85
Delay due to Incidents (percent)	53	53	53	53	53
<b>Travel Time Index</b>	1.02	1.02	1.02	1.02	1.02
Rank	80	80	76	74	74
<b>Congestion Cost</b>					
Total Cost (\$ millions)	1	1	1	1	1
Rank	89	89	89	89	89
Cost per Peak Traveler (\$)	25	20	17	19	15
Rank	88	90	90	87	90

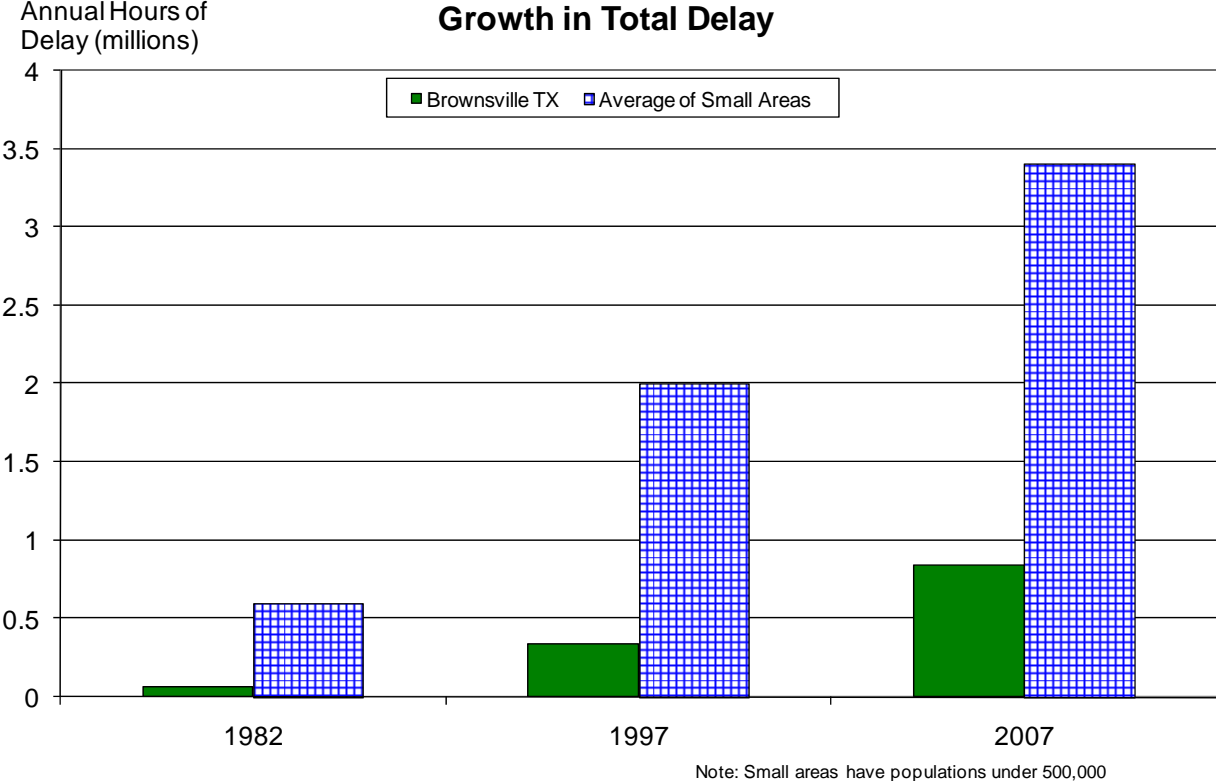
Note: System Performance statistics for 2000 through 2007 data reflect the effects of operational treatments.

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### Growth in Delay per Peak Traveler



### Growth in Total Delay



**Benefits from Public Transportation Service and Operations Strategies in  
Brownsville TX**

<b>Operations Strategies</b>	<b>2007</b>	<b>2006</b>	<b>2005</b>	<b>2004</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	86	86	81	81
Annual Delay Reduction (1000 hours)	11	7	7	10
<b>Arterial Access Management</b>				
Percent of Roadway Miles	14	14	13	12
Annual Delay Reduction (1000 hours)	7	8	--	--
<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)	18	14	7	10
Annual Delay Saved per Peak Traveler (hours)	0	0	0	0
Annual Congestion Cost Savings (\$million)	0.4	0.3	0.1	0.2
Travel Time Index with Strategies	1.074	1.069	1.065	1.066
Travel Time Index (Base)	1.075	1.070	1.066	1.067
<b>Public Transportation Service</b>	<b>2007</b>	<b>2006</b>	<b>2005</b>	<b>2004</b>
<b>Existing Service</b>				
Annual Passenger-miles of travel (million)	15.7	16.5	14.3	13.8
Unlinked Passenger Trips (million)	1.8	1.9	1.7	1.6
Travel Time Index (combined road and transit)	1.074	1.068	1.064	1.065
<b>Condition if Public Transportation Service were Discontinued</b>				
Travel Time Index	1.080	1.074	1.069	1.070
Annual Increase				
Delay (1000 hours)	75	68	60	55
Delay per Peak Traveler (hours)	1	1	1	1
Congestion Cost (\$million)	1.5	1.3	1.1	1.0

**Benefits from Public Transportation Service and Operations Strategies in  
Brownsville TX, Continued**

<b>Operations Strategies</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	70	65	56	55
Annual Delay Reduction (1000 hours)	11	12	13	4
<b>Arterial Access Management</b>				
Percent of Roadway Miles	12	12	12	12
Annual Delay Reduction (1000 hours)	--	--	13	--
<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)	11	12	26	4
Annual Delay Saved per Peak Traveler (hours)	0	0	0	0
Annual Congestion Cost Savings (\$million)	0.2	0.2	0.4	0.1
Travel Time Index with Strategies	1.065	1.066	1.067	1.062
Travel Time Index (Base)	1.066	1.067	1.069	1.063
<b>Public Transportation Service</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
<b>Existing Service</b>				
Annual Passenger-miles of travel (million)	13.7	14.8	14.1	14.1
Unlinked Passenger Trips (million)	1.6	1.7	1.6	1.6
Travel Time Index (combined road and transit)	1.064	1.065	1.068	1.061
<b>Condition if Public Transportation Service were Discontinued</b>				
Travel Time Index	1.070	1.070	1.073	1.067
Annual Increase				
Delay (1000 hours)	54	52	51	56
Delay per Peak Traveler (hours)	1	1	1	1
Congestion Cost (\$million)	0.9	0.9	0.9	0.9

**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 2007	
				Delay per Traveler	Total Delay
Knoxville, TN	H+	H	H+	F	F+
Charleston-North Charleston, SC	H+	H+	H+	F+	F+
Cape Coral, FL	H+	H+	H+	F+	F+
Columbia, SC	H	0	H+	F+	F+
Wichita, KS	L-	L-	L-	S-	S-
Little Rock, AR	H	0	H	F+	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-	L	L-	S-	S-
Salem, OR	L	0	L	0	S-
Beaumont, TX	L-	L-	L-	S-	S-
Laredo, TX	L	H	L-	0	S-
<b>Brownsville, TX</b>	<b>L-</b>	<b>L</b>	<b>L-</b>	<b>S-</b>	<b>S-</b>
Boulder, CO	L-	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

**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>2007 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 2007 Trends</b> Delay per Traveler - Total Delay -	5 Hours 5 Hours x Average Population	3 Hours 3 Hours x Average Population