

Performance Measure Summary – Chicago, IL

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 Chicago IL-IN

Inventory Measures	2007	2006	2005	2004	2003	2002
Urban Area Information						
Population (1000s)	8,440	8,420	8,400	8,340	8,275	8,210
Rank	3	3	3	3	3	3
Urban Area (square miles)	3,520	3,500	3,300	3,125	3,000	2,910
Population Density (persons/sq mile)	2,398	2,406	2,545	2,669	2,758	2,821
Peak Travelers (1000s)	4,566	4,547	4,519	4,462	4,402	4,335
Freeway						
Daily Vehicle-Miles of Travel (1000s)	55,150	55,350	55,050	54,000	52,010	51,425
Lane-Miles	2,980	2,870	2,725	2,680	2,665	2,665
Arterial Streets						
Daily Vehicle-Miles of Travel (1000s)	50,200	50,400	50,500	50,000	49,000	48,425
Lane-Miles	13,250	13,100	12,900	12,615	12,395	12,100
Public Transportation						
Annual Psgr-Miles of Travel (millions)	4,025	3,943	3,873	3,751	3,679	3,700
Annual Unlinked Psgr Trips (millions)	619	611	604	583	582	596
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)	3.24	2.73	2.34	1.95	1.57	1.46
System Performance	2007	2006	2005	2004	2003	2002
Congested Travel (% of peak VMT)	79	80	82	82	81	80
Congested System (% of lane-miles)	62	62	63	62	62	62
Congested Time (number of "Rush Hours")	7.4	7.6	7.8	7.6	7.6	7.6
Annual Increase Needed to Maintain Constant Congestion Level:						
Lane-miles	175	283	300	275	204	249
Transit Riders or Carpoolers (millions)	39	65	70	65	48	58
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	129,365	137,116	141,472	132,587	124,959	119,478
Rank	3	3	3	3	3	3
Fuel per Peak Traveler (gallons)	28	30	31	30	28	28
Rank	20	18	17	14	17	17
Annual Delay						
Total Delay (1000s of person-hours)	189,201	197,637	202,662	189,761	178,183	170,509
Rank	3	3	3	3	3	3
Delay per Peak Traveler (person-hours)	41	43	45	43	40	39
Rank	21	20	18	17	19	20
Delay due to Incidents (percent)	49	49	49	49	49	49
Travel Time Index	1.43	1.45	1.47	1.44	1.43	1.41
Rank	2	2	2	2	2	2
Congestion Cost						
Total Cost (\$ millions)	4,207	4,217	4,131	3,670	3,304	3,093
Rank	3	3	3	3	3	3
Cost per Peak Traveler (\$)	921	927	914	823	751	713
Rank	20	19	18	16	18	17

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 Chicago IL-IN, Continued

Inventory Measures	2001	2000	1999	1998	1997
Urban Area Information					
Population (1000s)	8,150	8,090	8,075	8,060	7,950
Rank	3	3	3	3	3
Urban Area (square miles)	2,830	2,785	2,765	2,760	2,740
Population Density (persons/sq mile)	2,880	2,905	2,920	2,920	2,901
Peak Travelers (1000s)	4,214	4,094	4,005	3,917	3,784
Freeway					
Daily Vehicle-Miles of Travel (1000s)	49,865	49,000	48,600	48,425	46,760
Lane-Miles	2,655	2,655	2,655	2,655	2,645
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	47,005	46,975	46,510	46,015	45,095
Lane-Miles	11,995	11,940	11,930	11,920	11,905
Public Transportation					
Annual Psgr-Miles of Travel (millions)	3,711	3,720	3,537	3,537	3,394
Annual Unlinked Psgr Trips (millions)	600	597	584	561	548
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)	1.50	1.70	1.17	1.15	1.21
System Performance	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)	75	74	74	74	73
Congested System (% of lane-miles)	57	57	57	57	57
Congested Time (number of "Rush Hours")	7.4	7.4	7.4	7.4	7.2
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	233	350	400	436	449
Transit Riders or Carpoolers (millions)	54	80	90	98	98
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	100,644	96,272	97,137	96,585	90,200
Rank	3	3	3	3	3
Fuel per Peak Traveler (gallons)	24	24	24	25	24
Rank	25	23	20	16	17
Annual Delay					
Total Delay (1000s of person-hours)	145,048	140,539	140,586	139,629	130,876
Rank	3	3	3	3	3
Delay per Peak Traveler (person-hours)	34	34	35	36	35
Rank	27	26	23	18	20
Delay due to Incidents (percent)	48	48	48	48	48
Travel Time Index	1.35	1.34	1.34	1.34	1.33
Rank	5	3	2	2	2
Congestion Cost					
Total Cost (\$ millions)	2,598	2,481	2,335	2,270	2,122
Rank	3	3	3	3	3
Cost per Peak Traveler (\$)	617	606	583	580	561
Rank	24	22	19	15	17

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 Chicago IL-IN, Continued

Inventory Measures	1996	1995	1994	1993	1992
Urban Area Information					
Population (1000s)	7,880	7,745	7,700	7,600	7,515
Rank	3	3	3	3	3
Urban Area (square miles)	2,740	2,700	2,500	2,250	2,175
Population Density (persons/sq mile)	2,876	2,869	3,080	3,378	3,455
Peak Travelers (1000s)	3,672	3,532	3,442	3,329	3,224
Freeway					
Daily Vehicle-Miles of Travel (1000s)	46,930	44,490	42,120	40,965	39,000
Lane-Miles	2,630	2,620	2,620	2,600	2,440
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	42,580	40,765	40,970	40,525	39,910
Lane-Miles	11,830	11,795	11,700	11,600	11,520
Public Transportation					
Annual Psgr-Miles of Travel (millions)	3,307	3,319	2,648	2,610	2,648
Annual Unlinked Psgr Trips (millions)	550	551	552	538	586
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)	1.39	1.28	1.11	1.16	1.19
System Performance	1996	1995	1994	1993	1992
Congested Travel (% of peak VMT)	73	68	62	61	62
Congested System (% of lane-miles)	57	56	55	55	52
Congested Time (number of "Rush Hours")	7.2	7.0	6.4	6.2	6.4
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	444	375	403	430	439
Transit Riders or Carpoolers (millions)	95	77	81	86	86
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	88,869	77,566	66,695	64,734	63,791
Rank	3	3	3	4	4
Fuel per Peak Traveler (gallons)	24	22	19	19	20
Rank	16	19	26	23	17
Annual Delay					
Total Delay (1000s of person-hours)	128,258	113,416	100,254	98,575	97,744
Rank	3	3	3	3	3
Delay per Peak Traveler (person-hours)	35	32	29	30	30
Rank	18	22	27	20	16
Delay due to Incidents (percent)	49	49	50	51	51
Travel Time Index	1.33	1.30	1.26	1.26	1.26
Rank	2	3	6	7	6
Congestion Cost					
Total Cost (\$ millions)	2,074	1,766	1,501	1,439	1,387
Rank	3	3	3	3	3
Cost per Peak Traveler (\$)	565	500	436	432	430
Rank	16	16	23	17	15

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 Chicago IL-IN, Continued

Inventory Measures	1991	1990	1989	1988	1987
Urban Area Information					
Population (1000s)	7,515	7,510	7,405	7,330	7,240
Rank	3	3	3	3	3
Urban Area (square miles)	2,050	1,990	1,985	1,990	1,960
Population Density (persons/sq mile)	3,666	3,774	3,730	3,683	3,694
Peak Travelers (1000s)	3,156	3,087	3,014	2,961	2,896
Freeway					
Daily Vehicle-Miles of Travel (1000s)	37,695	36,225	34,000	32,200	30,255
Lane-Miles	2,300	2,230	2,125	2,110	2,095
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	39,250	38,740	38,325	38,000	37,340
Lane-Miles	11,405	11,300	11,190	11,100	11,050
Public Transportation					
Annual Psgr-Miles of Travel (millions)	3,506	3,652	3,773	3,686	3,500
Annual Unlinked Psgr Trips (millions)	651	697	698	702	691
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)	1.19	1.16	1.13	1.04	1.05
System Performance	1991	1990	1989	1988	1987
Congested Travel (% of peak VMT)	61	60	59	54	51
Congested System (% of lane-miles)	52	52	51	47	47
Congested Time (number of "Rush Hours")	6.4	6.4	6.2	5.8	5.4
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	428	447	452	413	343
Transit Riders or Carpoolers (millions)	83	86	85	76	61
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	61,432	59,651	57,120	49,035	44,116
Rank	4	4	4	4	4
Fuel per Peak Traveler (gallons)	19	19	19	17	15
Rank	18	17	16	16	16
Annual Delay					
Total Delay (1000s of person-hours)	93,416	91,353	88,893	76,901	70,711
Rank	3	4	4	4	4
Delay per Peak Traveler (person-hours)	30	30	29	26	24
Rank	16	16	17	17	16
Delay due to Incidents (percent)	50	51	52	52	52
Travel Time Index	1.26	1.26	1.26	1.22	1.21
Rank	8	5	5	6	7
Congestion Cost					
Total Cost (\$ millions)	1,293	1,213	1,114	917	815
Rank	3	3	4	4	4
Cost per Peak Traveler (\$)	410	393	370	309	282
Rank	15	13	14	16	14

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.

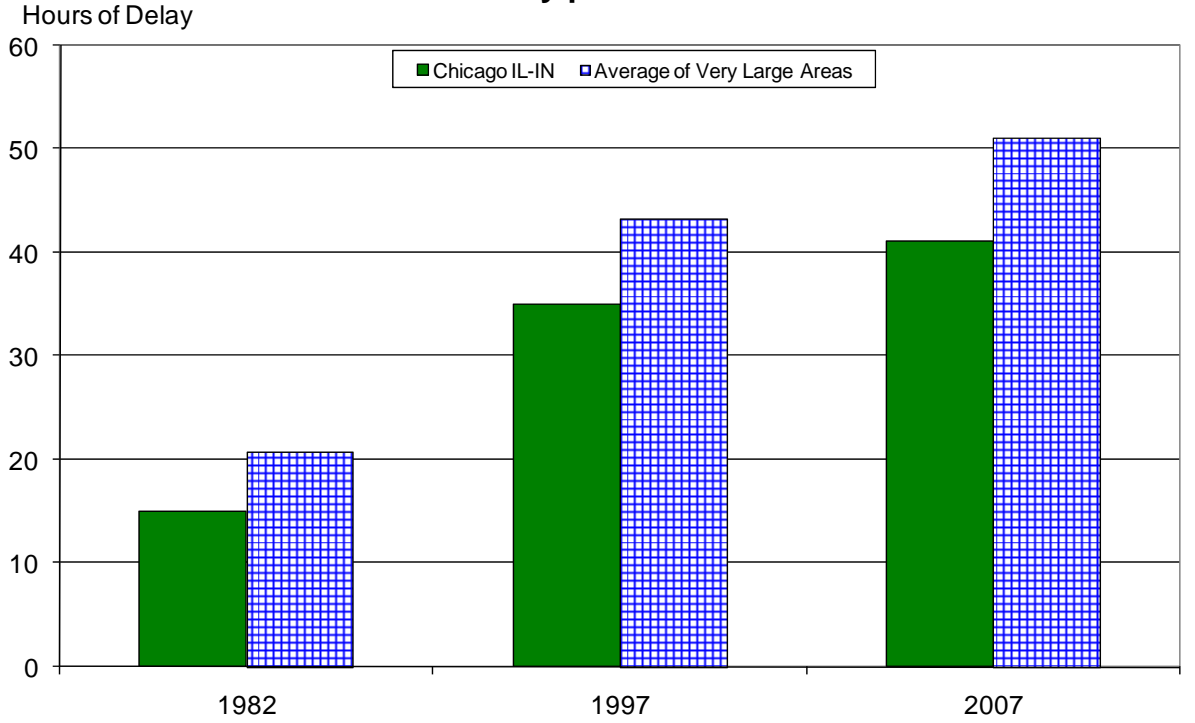
The Mobility Data for Chicago IL-IN, Continued

Inventory Measures	1986	1985	1984	1983	1982
Urban Area Information					
Population (1000s)	7,195	7,150	7,100	7,100	7,080
Rank	3	3	3	3	3
Urban Area (square miles)	1,960	1,960	1,960	1,960	1,900
Population Density (persons/sq mile)	3,671	3,648	3,622	3,622	3,726
Peak Travelers (1000s)	2,849	2,810	2,762	2,741	2,705
Freeway					
Daily Vehicle-Miles of Travel (1000s)	29,005	27,715	25,605	24,795	24,325
Lane-Miles	2,035	1,980	1,965	1,980	1,935
Arterial Streets					
Daily Vehicle-Miles of Travel (1000s)	36,975	36,020	35,590	35,400	35,100
Lane-Miles	11,010	10,900	10,820	10,785	10,745
Public Transportation					
Annual Psgr-Miles of Travel (millions)	3,500	3,681	3,570	3,570	3,570
Annual Unlinked Psgr Trips (millions)	700	744	734	734	734
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)	1.02	1.34	1.35	1.38	1.44
System Performance	1986	1985	1984	1983	1982
Congested Travel (% of peak VMT)	50	45	39	34	34
Congested System (% of lane-miles)	47	42	41	36	36
Congested Time (number of "Rush Hours")	5.2	5.0	4.4	4.0	4.0
Annual Increase Needed to Maintain Constant Congestion Level:					
Lane-miles	--	--	--	--	--
Transit Riders or Carpoolers (millions)	--	--	--	--	--
Annual Excess Fuel Consumed					
Total Fuel (1000 gallons)	42,840	37,209	29,240	23,989	24,124
Rank	4	4	5	5	3
Fuel per Peak Traveler (gallons)	15	13	11	9	9
Rank	12	14	18	23	20
Annual Delay					
Total Delay (1000s of person-hours)	68,894	60,234	47,588	39,192	39,292
Rank	3	3	4	4	3
Delay per Peak Traveler (person-hours)	24	21	17	14	15
Rank	11	14	21	26	20
Delay due to Incidents (percent)	52	53	53	53	53
Travel Time Index	1.21	1.18	1.15	1.12	1.12
Rank	6	7	7	11	8
Congestion Cost					
Total Cost (\$ millions)	767	686	521	413	407
Rank	3	3	3	4	3
Cost per Peak Traveler (\$)	269	244	189	151	151
Rank	11	13	20	25	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.

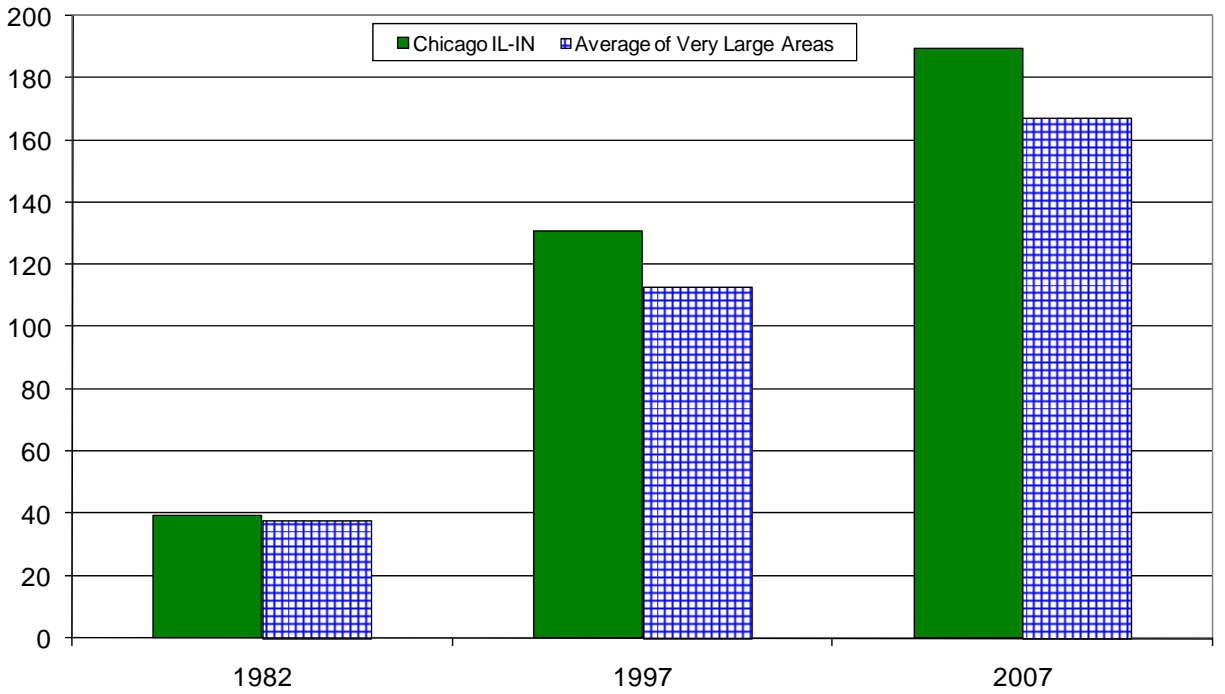
Growth in Delay per Peak Traveler



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
Chicago IL-IN**

Operations Strategies	2007	2006	2005	2004
Freeway Ramp Metering				
Percent of Roadway Miles	21	22	23	23
Annual Delay Reduction (1000 hours)	887	1,001	1,124	1,054
Freeway Incident Management				
Cameras				
Percent of Roadway Miles	38	39	40	41
Service Patrols				
Percent of Roadway Miles	54	57	59	60
Annual Delay Reduction (1000 hours)	3,997	4,302	3,660	3,438
Arterial Signal Coordination				
Percent of Roadway Miles	53	53	54	56
Annual Delay Reduction (1000 hours)	505	543	625	589
Arterial Access Management				
Percent of Roadway Miles	13	13	14	14
Annual Delay Reduction (1000 hours)	2,649	3,385	3,002	3,396
HOV Lanes				
Daily Passenger-miles of travel (1000s)	--	--	--	--
HOV User Delay Savings	--	--	--	--
Total Effect of Operations Treatments				
Annual Delay Reduction (1000 hours)	8,038	9,230	8,411	8,477
Annual Delay Saved per Peak Traveler (hours)	2	2	2	2
Annual Congestion Cost Savings (\$million)	179.5	196.7	171.6	163.7
Travel Time Index with Strategies	1.425	1.453	1.472	1.444
Travel Time Index (Base)	1.441	1.472	1.490	1.462
Public Transportation Service	2007	2006	2005	2004
Existing Service				
Annual Passenger-miles of travel (million)	4,025	3,943	3,873	3,751
Unlinked Passenger Trips (million)	619	611	604	583
Travel Time Index (combined road and transit)	1.385	1.413	1.429	1.406
Condition if Public Transportation Service were Discontinued				
Travel Time Index	1.504	1.539	1.549	1.526
Annual Increase				
Delay (1000 hours)	48,751	50,230	47,642	47,079
Delay per Peak Traveler (hours)	11	11	11	11
Congestion Cost (\$million)	1,121.1	1,103.6	998.9	936.4

**Benefits from Public Transportation Service and Operations Strategies in
Chicago IL-IN, Continued**

Operations Strategies	2003	2002	2001	2000
Freeway Ramp Metering				
Percent of Roadway Miles	23	23	21	21
Annual Delay Reduction (1000 hours)	966	939	602	545
Freeway Incident Management				
Cameras				
Percent of Roadway Miles	28	28	27	26
Service Patrols				
Percent of Roadway Miles	50	50	50	50
Annual Delay Reduction (1000 hours)	2,686	2,431	1,644	1,513
Arterial Signal Coordination				
Percent of Roadway Miles	56	56	57	55
Annual Delay Reduction (1000 hours)	632	558	540	547
Arterial Access Management				
Percent of Roadway Miles	13	13	13	13
Annual Delay Reduction (1000 hours)	2,925	2,455	2,361	1,866
HOV Lanes				
Daily Passenger-miles of travel (1000s)	--	--	--	--
HOV User Delay Savings	--	--	--	--
Total Effect of Operations Treatments				
Annual Delay Reduction (1000 hours)	7,208	6,383	5,146	4,470
Annual Delay Saved per Peak Traveler (hours)	2	1	1	1
Annual Congestion Cost Savings (\$million)	133.6	116.3	92.1	79.5
Travel Time Index with Strategies	1.429	1.412	1.350	1.337
Travel Time Index (Base)	1.445	1.427	1.361	1.347
Public Transportation Service	2003	2002	2001	2000
Existing Service				
Annual Passenger-miles of travel (million)	3,679	3,700	3,711	3,720
Unlinked Passenger Trips (million)	582	596	600	597
Travel Time Index (combined road and transit)	1.390	1.374	1.315	1.302
Condition if Public Transportation Service were Discontinued				
Travel Time Index	1.528	1.509	1.433	1.416
Annual Increase				
Delay (1000 hours)	51,537	51,286	46,347	45,318
Delay per Peak Traveler (hours)	12	12	11	11
Congestion Cost (\$million)	984.0	956.4	856.8	828.7

**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