

## 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
<b>Colorado Springs, CO</b>	<b>H+</b>	<b>H+</b>	<b>H+</b>	<b>F+</b>	<b>F+</b>
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	
	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 Colorado Springs, CO

<b>Inventory Measures</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
<b>Urban Area Information</b>						
Population (1000s)	490	480	480	475	470	465
Rank	70	70	70	70	70	70
Urban Area (square miles)	380	380	300	255	250	250
Popn Density (persons/sq mile)	1,289	1,263	1,600	1,863	1,880	1,860
Peak Travelers (1000s)	267	260	259	252	246	239
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	4,125	3,705	3,435	3,300	3,150	3,000
Lane Miles	325	325	290	275	260	250
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	5,415	5,200	4,970	4,720	4,610	4,485
Lane Miles	1,305	1,280	1,175	1,055	1,030	1,020
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	17	10	12	14	14	16
Annual Unlinked Psgr Trips (millions)	3	3	3	4	3	4
<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)	2.32	1.94	1.51	1.39	1.70	1.55
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	36	30	33	34	34	33
<b>Congested System</b> (% of lane-miles)	31	34	34	34	34	34
<b>Congested Time</b> (number of "Rush Hours")	4.8	4.0	4.4	4.6	4.8	4.6
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	81	75	70	64	73	71
Transit Riders or Carpoolers (millions)	16	15	14	13	15	14
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	4,377	3,372	3,667	3,725	3,686	3,492
Rank	63	66	66	65	65	65
Fuel per Peak Traveler (gallons)	16	13	14	15	15	15
Rank	46	57	51	49	46	46
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	7,332	5,668	6,116	6,240	6,198	5,901
Rank	62	65	65	64	64	63
Delay per Peak Traveler (person-hrs)	27	22	24	25	25	25
Rank	45	52	49	47	46	45
Delay due to Incidents (percent)	59	58	58	58	59	59
<b>Travel Time Index</b>						
Rank	1.14	1.12	1.13	1.14	1.15	1.14
Rank	51	54	54	50	44	49
<b>Congestion Cost</b>						
Total Cost (\$ millions)	131	97	102	101	100	92
Rank	62	65	65	64	64	63
Cost per Peak Traveler (\$)	492	372	393	402	408	384
Rank	46	55	50	48	46	47

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 Colorado Springs, CO, 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)	440	425	415	400	385	370
Rank	70	71	71	71	71	71
Urban Area (square miles)	245	240	235	235	225	220
Popn Density (persons/sq mile)	1,796	1,771	1,766	1,702	1,711	1,682
Peak Travelers (1000s)	223	213	204	194	184	174
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	2,800	2,650	2,500	2,260	2,185	2,000
Lane Miles	245	240	235	230	230	230
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	4,280	4,020	3,840	3,650	3,530	3,420
Lane Miles	1,010	990	975	965	945	930
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	18	18	18	18	15	15
Annual Unlinked Psgr Trips (millions)	4	4	4	4	4	4
<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)	1.16	1.10	1.24	1.36	1.22	1.16
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	31	27	24	21	20	19
<b>Congested System</b> (% of lane-miles)	34	30	29	25	25	25
<b>Congested Time</b> (number of "Rush Hours")	4.2	3.8	3.4	3.0	2.9	2.8
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	68	63	60	51	47	40
Transit Riders or Carpoolers (millions)	14	12	11	9	8	7
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	2,979	2,395	1,977	1,497	1,404	1,181
Rank	65	67	68	72	71	71
Fuel per Peak Traveler (gallons)	13	11	10	8	8	7
Rank	57	64	66	68	66	71
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	4,976	3,996	3,277	2,451	2,291	1,909
Rank	64	64	68	71	70	72
Delay per Peak Traveler (person-hrs)	22	19	16	13	12	11
Rank	57	60	64	67	66	71
Delay due to Incidents (percent)	59	59	58	58	58	57
<b>Travel Time Index</b>						
Rank	52	58	61	66	64	68
<b>Congestion Cost</b>						
Total Cost (\$ millions)	73	58	47	34	31	25
Rank	64	65	68	71	70	74
Cost per Peak Traveler (\$)	329	272	229	177	170	144
Rank	57	60	64	67	66	72

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 Colorado Springs, CO, 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)	355	340	330	320	310	310
Rank	71	71	72	72	72	72
Urban Area (square miles)	220	215	210	205	200	200
Popn Density (persons/sq mile)	1,614	1,581	1,571	1,561	1,550	1,550
Peak Travelers (1000s)	164	155	148	141	136	135
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	1,890	1,815	1,795	1,780	1,780	1,760
Lane Miles	230	230	230	220	220	215
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	3,310	3,170	3,005	2,910	2,795	2,705
Lane Miles	915	905	890	870	870	865
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	15	17	17	15	16	15
Annual Unlinked Psgr Trips (millions)	4	4	4	3	4	4
<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)	1.21	1.23	1.19	1.11	1.15	1.06
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	16	14	12	11	10	10
<b>Congested System</b> (% of lane-miles)	20	20	15	14	10	10
<b>Congested Time</b> (number of "Rush Hours")	2.7	2.6	2.6	2.6	2.6	2.5
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	35	30	28	29	46	59
Transit Riders or Carpoolers (millions)	6	5	4	4	7	8
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	921	776	581	526	430	416
Rank	74	73	75	76	78	77
Fuel per Peak Traveler (gallons)	6	5	4	4	3	3
Rank	74	73	79	77	79	76
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	1,497	1,293	959	869	705	684
Rank	74	73	76	76	78	77
Delay per Peak Traveler (person-hrs)	9	8	6	6	5	5
Rank	73	73	77	76	79	76
Delay due to Incidents (percent)	56	55	55	54	54	54
<b>Travel Time Index</b>						
Rank	72	72	79	79	81	81
<b>Congestion Cost</b>						
Total Cost (\$ millions)	19	16	12	10	8	7
Rank	74	74	76	76	78	77
Cost per Peak Traveler (\$)	117	105	80	73	57	53
Rank	74	73	78	78	80	77

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 Colorado Springs, CO, 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)	305	300	295	290	285	280
Rank	72	72	72	72	72	72
Urban Area (square miles)	195	190	185	180	180	175
Popn Density (persons/sq mile)	1,564	1,579	1,595	1,611	1,583	1,600
Peak Travelers (1000s)	132	128	125	122	119	116
<b>Freeway</b>						
Daily Vehicle-Miles of Travel (1000s)	1,760	1,705	1,640	1,300	1,105	1,000
Lane Miles	215	215	215	200	175	150
<b>Arterial Streets</b>						
Daily Vehicle-Miles of Travel (1000s)	2,610	2,550	2,465	2,410	2,330	2,220
Lane Miles	860	850	840	840	835	830
<b>Public Transportation</b>						
Annual Psgr-Miles of Travel (millions)	15	15	15	16	16	16
Annual Unlinked Psgr Trips (millions)	4	4	4	4	4	4
<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)	1.06	1.04	1.36	1.37	1.41	1.47
<b>System Performance</b>						
<b>Congested Travel</b> (% of peak VMT)	9	8	8	8	8	8
<b>Congested System</b> (% of lane-miles)	10	9	9	9	9	9
<b>Congested Time</b> (number of "Rush Hours")	2.5	2.5	2.4	2.2	2.2	2.2
<b>Annual Increase Needed To Maintain Constant Congestion Level:</b>						
Lane-Miles	68	--	--	--	--	--
Transit Riders or Carpoolers (millions)	10	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	401	365	339	304	284	273
Rank	76	77	75	76	74	74
Fuel per Peak Traveler (gallons)	3	3	3	2	2	2
Rank	73	74	72	70	69	69
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	659	615	578	534	493	475
Rank	76	77	75	76	74	75
Delay per Peak Traveler (person-hrs)	5	5	5	4	4	4
Rank	72	72	72	70	69	69
Delay due to Incidents (percent)	54	54	53	53	53	53
<b>Travel Time Index</b>						
Rank	78	76	78	73	71	70
<b>Congestion Cost</b>						
Total Cost (\$ millions)	7	6	6	5	5	4
Rank	77	77	76	76	75	75
Cost per Peak Traveler (\$)	51	47	45	41	38	37
Rank	72	72	73	70	69	70

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

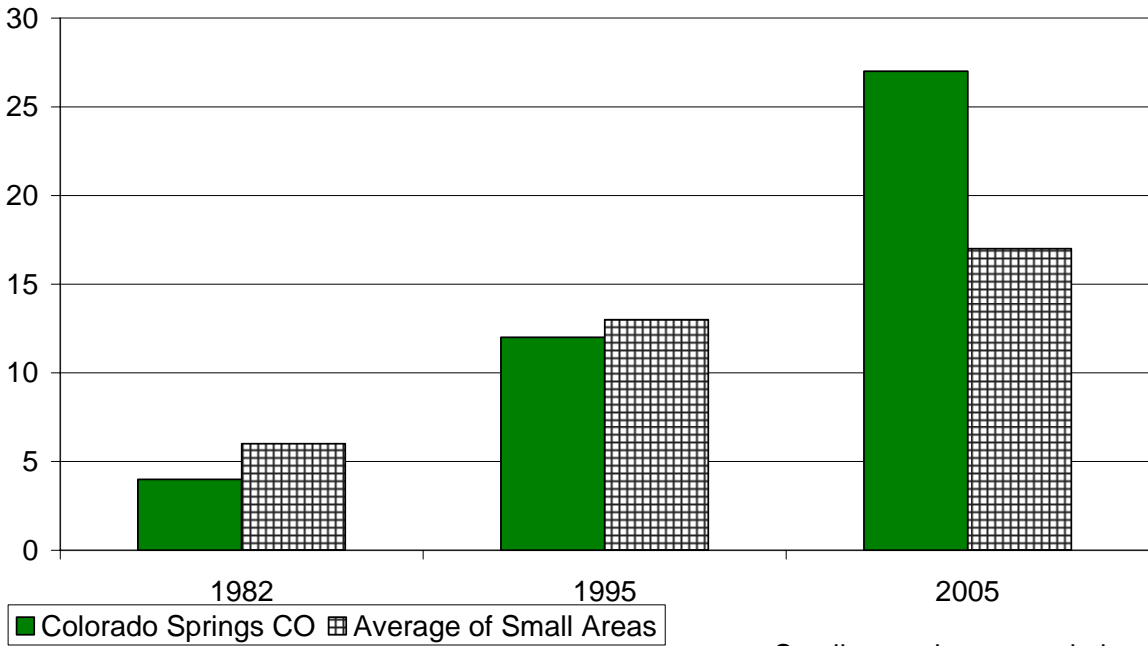
Note: Zeroes in the table reflect values less than 0.5.

## Benefits From Public Transportation Service and Operations Strategies for Colorado Springs, CO

<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	26	26	30	30	--	--
<b>Service Patrols</b>						
Percent of Roadway Miles	--	--	--	--	--	--
Annual Delay Reduction (1000 hours)	14	9	12	14	--	--
<b>Arterial Signal Coordination</b>						
Percent of Roadway Miles	54	53	51	52	49	49
Annual Delay Reduction (1000 hours)	71	49	61	54	94	49
<b>Arterial Access Management</b>						
Percent of Roadway Miles	31	31	35	39	38	38
Annual Delay Reduction (1000 hours)	159	171	150	139	161	101
<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)	243	229	223	207	255	150
Annual Delay Saved per Peak Traveler (hours)	1	1	1	1	1	1
Annual Congestion Cost Savings (\$million)	4.2	3.8	3.6	3.3	3.9	2.2
Travel Time Index with Strategies	1.142	1.116	1.135	1.144	1.147	1.144
Travel Time Index (Base)	1.146	1.119	1.138	1.147	1.152	1.147
<b>Public Transportation Service</b>						
<b>Existing Service</b>						
Annual Passenger-miles of Travel (million)	17	10	12	14	14	16
Unlinked Passenger Trips (million)	3	3	3	4	3	4
Travel Time Index (combined road and transit)	1.140	1.114	1.133	1.142	1.145	1.143
<b>Condition if Public Transportation Service were Discontinued</b>						
Travel Time Index	1.149	1.121	1.140	1.148	1.154	1.150
Annual Delay Increase (1000 hours)	226	138	128	96	158	176
Annual Delay Increase per Peak Traveler (hours)	1	1	0	0	1	1
Annual Congestion Cost Increase (\$million)	4.0	2.3	2.1	1.6	2.6	2.8

### Growth in Delay per Peak Traveler

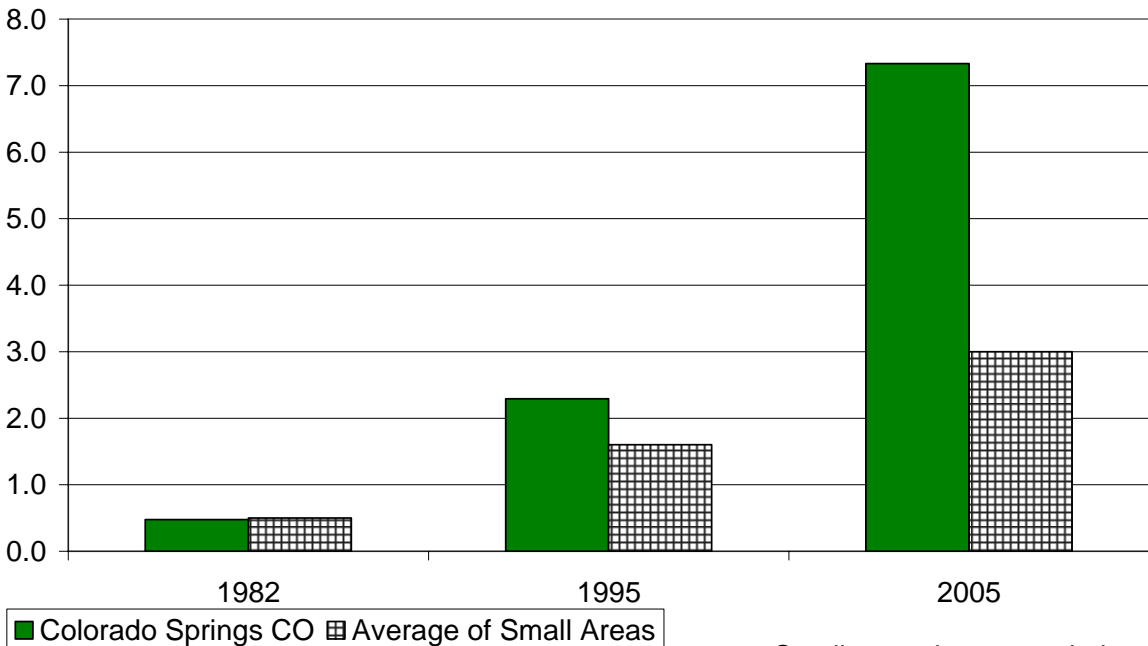
Hours of Delay



Small areas have populations under 0.5 million

### Growth in Total Delay

Annual Hours of Delay (million)



Small areas have populations under 0.5 million