

# Performance Measure Summary - Springfield MA-CT

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2017. There is no single performance measure that experts agree "says it all". A few key points should be recognized by users of the Urban Mobility Scorecard data.

**Use the trends** - The multi-year performance measures are better indicators, in most cases, than any single year. 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. (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 atop several 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. It is calculated as the ratio of travel time in the peak period to travel time in free-flow. A value of 1.30 indicates that a 20-minute free-flow trip takes 26 minutes in the peak.

**Planning Time Index** - A travel time reliability measure that represents the total travel time that should be planned for a trip. Computed with the 95th percentile travel time it represents the amount of time that should be planned for a commute trip to be late for only 1 day a month. If it is computed with the 80th percentile travel time it represents the amount of time that should be planned for a trip to be late for only 1 day a week. A PTI of 2.00 means that for a 20-minute trip in light traffic, 40 minutes should be planned.

**Peak Commuters** - Number of travelers who begin a trip during the morning or evening peak travel periods (6 to 10 a.m. and 3 to 7 p.m.). "Commuters" are private vehicle users unless specifically noted.

**Annual Delay per Commuter** - A yearly sum of all the per-trip delays for those persons who travel in the peak period (6 to 10 a.m. and 3 to 7 p.m.). This measure illustrates the effect of traffic slowdowns as well as the length of each trip.

**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** - These values are derived from time periods with lighter traffic volumes in the INRIX speed database. They are used as the national comparison thresholds. Other speed thresholds may be appropriate for urban project evaluations or sub-region studies.

**Excess Fuel Consumed** - Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

**Congestion Cost** - Value of travel delay for 2017 (estimated at \$18.29 per hour of person travel and \$59.94 per hour of truck time) and excess fuel consumption estimated using state average cost per gallon.

**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), so increases include both new growth and development that was previously in areas designated as rural.

**Number of Rush Hours** - Time when the road system might have congestion.

# Mobility Data for Springfield MA-CT

Inventory Measures	2017	2016	2015	2014	2013	2012
<b>Urban Area Information</b>						
Population (1000s)	630	630	630	625	625	625
Rank	66	66	66	67	65	65
Commuters (1000s)	311	311	311	310	316	316
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	5,832	5,774	6,093	5,587	5,669	5,375
Arterial Streets	6,842	6,556	7,218	6,589	6,421	6,010
<b>Cost Components</b>						
Value of Time (\$/hour)	18.12	17.91	17.69	17.67	17.39	17.14
Commercial Cost (\$/hour)	52.14	50.20	46.87	44.82	41.23	39.66
Gasoline (\$/gallon)	2.35	2.17	2.31	3.46	3.58	3.53
Diesel (\$/gallon)	2.55	2.31	2.63	3.69	3.94	3.93
System Performance	2017	2016	2015	2014	2013	2012
<b>Congested Travel (% of peak VMT)</b>	1.1	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	7.2	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	0.8	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	7,524	7,399	7,258	7,146	7,072	7,026
Rank	65	65	66	66	66	65
Fuel per Peak Auto Commuter (gallons)	19	19	19	19	19	19
Rank	55	53	50	47	45	42
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	17,561	17,087	16,619	16,081	15,635	15,393
Rank	68	69	69	70	70	69
Delay per Auto Commuter (pers-hrs)	41	41	41	40	39	39
Rank	70	68	63	63	63	61
<b>Travel Time Index</b>						
Rank	1.12	1.12	1.12	1.13	1.13	1.13
Rank	93	93	92	86	87	85
<b>Commuter Stress Index</b>						
Rank	1.13	--	--	--	--	--
Rank	90	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	1.21	--	--	--	--	--
Rank	90	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	357	341	328	324	310	301
Rank	68	69	69	70	70	68
Cost per Auto Commuter (\$)	725	713	688	663	652	649
Rank	75	76	73	75	74	70
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	738	718	698	675	657	647
Rank	68	69	69	70	70	69
Annual Gallons of Wasted Fuel (000)	1,595	1,569	1,539	1,515	1,499	1,489
Rank	65	65	66	66	66	65
Annual Congestion Cost (\$ million)	38	35	33	32	30	28
Rank	66	69	68	70	66	68

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

# Mobility Data for Springfield MA-CT

Inventory Measures	2011	2010	2009	2008	2007	2006
<b>Urban Area Information</b>						
Population (1000s)	625	625	625	625	625	625
Rank	65	65	65	63	63	63
Commuters (1000s)	315	314	313	312	310	308
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	5,613	5,604	5,450	5,250	5,380	5,400
Arterial Streets	5,899	5,890	5,861	5,920	5,965	5,990
<b>Cost Components</b>						
Value of Time (\$/hour)	16.79	16.28	16.01	16.07	15.47	15.06
Commercial Cost (\$/hour)	44.62	42.50	41.83	40.77	39.30	37.88
Gasoline (\$/gallon)	3.49	2.75	2.27	3.32	2.98	2.67
Diesel (\$/gallon)	3.73	3.04	2.70	4.32	3.53	2.87
System Performance	2011	2010	2009	2008	2007	2006
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	6,864	6,806	6,733	6,906	6,844	6,755
Rank	67	67	65	65	65	65
Fuel per Peak Auto Commuter (gallons)	18	18	18	19	18	18
Rank	49	46	34	37	49	47
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	14,632	14,375	13,955	13,631	13,509	13,334
Rank	69	68	67	67	66	64
Delay per Auto Commuter (pers-hrs)	38	36	36	35	35	35
Rank	63	64	61	66	69	62
<b>Travel Time Index</b>						
Rank	1.13	1.13	1.13	1.13	1.13	1.13
Rank	84	83	84	86	85	82
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	284	266	251	255	241	229
Rank	69	68	67	67	66	64
Cost per Auto Commuter (\$)	635	645	636	617	636	642
Rank	73	71	70	72	70	66
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	615	604	586	573	567	560
Rank	69	68	67	67	66	64
Annual Gallons of Wasted Fuel (000)	1,455	1,443	1,427	1,464	1,451	1,432
Rank	67	67	65	65	65	65
Annual Congestion Cost (\$ million)	29	27	25	27	25	23
Rank	68	67	66	65	64	64

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

# Mobility Data for Springfield MA-CT

Inventory Measures	2005	2004	2003	2002	2001	2000
<b>Urban Area Information</b>						
Population (1000s)	620	620	620	620	615	615
Rank	62	61	61	61	61	61
Commuters (1000s)	304	302	300	297	291	287
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	5,450	5,310	5,030	4,805	4,215	4,250
Arterial Streets	5,960	5,960	6,020	6,095	5,825	5,890
<b>Cost Components</b>						
Value of Time (\$/hour)	14.58	14.10	13.73	13.43	13.22	12.85
Commercial Cost (\$/hour)	36.51	35.19	33.92	32.69	31.51	30.38
Gasoline (\$/gallon)	2.28	2.02	1.53	1.40	1.70	1.58
Diesel (\$/gallon)	2.56	2.05	1.64	1.45	1.65	1.61
System Performance	2005	2004	2003	2002	2001	2000
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	6,598	6,455	6,303	6,038	5,978	5,965
Rank	65	64	62	61	60	59
Fuel per Peak Auto Commuter (gallons)	18	17	18	16	16	17
Rank	43	46	30	42	36	24
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	13,024	12,741	12,441	11,919	11,801	11,773
Rank	64	63	63	63	60	59
Delay per Auto Commuter (pers-hrs)	35	35	34	33	33	33
Rank	59	56	58	59	58	56
<b>Travel Time Index</b>						
Rank	1.13	1.13	1.12	1.12	1.12	1.12
Rank	82	81	82	82	78	77
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	215	202	189	176	173	168
Rank	64	63	63	63	60	59
Cost per Auto Commuter (\$)	651	659	661	645	645	666
Rank	64	64	63	64	58	53
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	547	535	523	501	496	494
Rank	64	63	63	63	60	59
Annual Gallons of Wasted Fuel (000)	1,399	1,368	1,336	1,280	1,267	1,264
Rank	65	64	62	61	60	59
Annual Congestion Cost (\$ million)	21	19	18	16	16	15
Rank	64	63	61	61	59	59

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

# Mobility Data for Springfield MA-CT

Inventory Measures	1999	1998	1997	1996	1995	1994
<b>Urban Area Information</b>						
Population (1000s)	605	600	600	595	595	590
Rank	60	60	60	60	59	58
Commuters (1000s)	279	273	270	264	261	255
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	4,140	3,980	3,845	3,720	3,715	3,660
Arterial Streets	5,835	5,675	5,430	5,435	5,425	5,325
<b>Cost Components</b>						
Value of Time (\$/hour)	12.43	12.17	11.98	11.71	11.37	11.06
Commercial Cost (\$/hour)	29.28	28.89	28.50	28.12	27.75	27.38
Gasoline (\$/gallon)	1.13	1.08	1.28	1.31	1.22	1.07
Diesel (\$/gallon)	1.19	1.21	1.33	1.37	1.28	1.12
System Performance	1999	1998	1997	1996	1995	1994
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	5,764	5,412	5,170	4,946	4,748	4,577
Rank	59	60	60	59	59	58
Fuel per Peak Auto Commuter (gallons)	16	16	15	14	13	13
Rank	27	18	17	18	19	15
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	11,377	10,682	10,205	9,762	9,372	9,035
Rank	59	61	60	60	60	57
Delay per Auto Commuter (pers-hrs)	33	31	30	29	28	28
Rank	51	56	56	54	52	48
<b>Travel Time Index</b>						
Rank	76	77	72	72	73	72
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	154	142	135	126	118	110
Rank	59	61	60	60	59	57
Cost per Auto Commuter (\$)	664	636	617	606	598	593
Rank	51	50	47	46	42	37
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	478	449	429	410	394	379
Rank	59	61	60	60	60	57
Annual Gallons of Wasted Fuel (000)	1,222	1,147	1,096	1,048	1,007	970
Rank	59	60	60	59	59	58
Annual Congestion Cost (\$ million)	14	13	12	12	11	10
Rank	58	58	60	57	55	56

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

# Mobility Data for Springfield MA-CT

Inventory Measures	1993	1992	1991	1990	1989	1988
<b>Urban Area Information</b>						
Population (1000s)	590	580	575	560	560	560
Rank	56	56	54	55	54	54
Commuters (1000s)	252	245	240	230	228	227
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	3,530	3,455	3,330	3,335	3,465	3,330
Arterial Streets	5,365	5,265	5,080	4,810	4,650	4,545
<b>Cost Components</b>						
Value of Time (\$/hour)	10.78	10.47	10.17	9.75	9.25	8.83
Commercial Cost (\$/hour)	27.02	26.66	26.30	25.95	25.60	25.26
Gasoline (\$/gallon)	1.15	1.14	1.23	1.04	1.06	0.98
Diesel (\$/gallon)	1.20	1.21	1.29	1.06	1.05	0.97
System Performance	1993	1992	1991	1990	1989	1988
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	4,250	4,034	3,814	3,542	3,378	3,122
Rank	57	58	56	54	52	53
Fuel per Peak Auto Commuter (gallons)	12	12	11	9	10	9
Rank	16	13	13	23	11	13
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	8,388	7,963	7,528	6,992	6,668	6,162
Rank	56	57	55	54	53	52
Delay per Auto Commuter (pers-hrs)	26	25	24	23	22	21
Rank	49	45	43	44	40	38
<b>Travel Time Index</b>						
Rank	1.09	1.09	1.09	1.08	1.08	1.07
Rank	74	70	62	63	56	60
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	100	92	85	76	69	61
Rank	56	57	54	54	53	52
Cost per Auto Commuter (\$)	565	552	542	525	526	516
Rank	36	32	30	28	29	27
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	352	334	316	294	280	259
Rank	56	57	55	54	53	52
Annual Gallons of Wasted Fuel (000)	901	855	809	751	716	662
Rank	57	58	56	54	52	53
Annual Congestion Cost (\$ million)	9	9	8	7	7	6
Rank	56	52	54	54	51	52

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

# Mobility Data for Springfield MA-CT

Inventory Measures	1987	1986	1985	1984	1983	1982
<b>Urban Area Information</b>						
Population (1000s)	555	550	545	540	535	530
Rank	54	53	53	52	51	51
Commuters (1000s)	223	219	216	212	208	204
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	3,130	2,985	2,795	2,815	2,605	2,625
Arterial Streets	4,525	4,390	4,490	4,465	4,425	4,340
<b>Cost Components</b>						
Value of Time (\$/hour)	8.48	8.18	8.03	7.75	7.43	7.20
Commercial Cost (\$/hour)	24.93	24.60	24.27	23.94	23.63	23.31
Gasoline (\$/gallon)	0.98	0.96	1.25	1.27	1.30	1.35
Diesel (\$/gallon)	0.97	0.95	1.24	1.25	1.28	1.34
System Performance	1987	1986	1985	1984	1983	1982
<b>Congested Travel (% of peak VMT)</b>	--	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	--	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	--	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	2,920	2,716	2,508	2,277	2,099	1,949
Rank	49	48	48	48	49	48
Fuel per Peak Auto Commuter (gallons)	9	8	8	7	6	4
Rank	13	14	13	12	13	19
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	5,763	5,362	4,950	4,495	4,144	3,846
Rank	50	49	49	48	48	47
Delay per Auto Commuter (pers-hrs)	20	19	17	16	15	14
Rank	36	35	38	41	40	40
<b>Travel Time Index</b>						
Rank	1.07	1.07	1.06	1.06	1.05	1.05
Rank	55	49	54	51	55	51
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	55	49	46	40	36	32
Rank	50	51	48	48	47	47
Cost per Auto Commuter (\$)	499	480	457	432	418	400
Rank	26	26	27	28	26	25
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	242	225	208	189	174	162
Rank	50	49	49	48	48	47
Annual Gallons of Wasted Fuel (000)	619	576	532	483	445	413
Rank	49	48	48	48	49	48
Annual Congestion Cost (\$ million)	6	5	5	5	4	4
Rank	47	50	46	46	47	44

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