

Performance Measure Summary - Buffalo NY

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 Buffalo NY

Inventory Measures	2017	2016	2015	2014	2013	2012
Urban Area Information						
Population (1000s)	940	945	945	945	965	985
Rank	50	50	50	50	47	45
Commuters (1000s)	449	450	451	451	448	457
Daily Vehicle-Miles of Travel (1000s)						
Freeway	6,796	6,849	6,812	6,786	6,662	6,560
Arterial Streets	9,959	9,786	9,735	9,291	9,409	9,515
Cost Components						
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)	2.48	2.33	2.51	3.63	3.79	3.75
Diesel (\$/gallon)	2.70	2.49	2.88	3.92	4.20	4.17
System Performance	2017	2016	2015	2014	2013	2012
Congested Travel (% of peak VMT)	25.9	--	--	--	--	--
Congested System (% of lane-miles)	2.4	--	--	--	--	--
Congested Time (number of "Rush Hours")	4.2	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	14,094	13,656	13,159	12,783	12,585	12,483
Rank	46	47	47	47	47	47
Fuel per Peak Auto Commuter (gallons)	23	23	23	21	21	21
Rank	29	27	25	30	30	28
Annual Delay						
Total Delay (1000s of person-hours)	31,977	30,526	28,913	27,842	27,170	26,474
Rank	47	47	47	47	47	47
Delay per Auto Commuter (pers-hrs)	48	48	47	47	46	44
Rank	42	39	39	34	34	38
Travel Time Index						
Rank	1.16	1.16	1.16	1.17	1.17	1.17
Rank	61	61	60	52	51	50
Commuter Stress Index						
Rank	1.17	--	--	--	--	--
Rank	66	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	1.44	--	--	--	--	--
Rank	50	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	652	612	574	564	543	521
Rank	47	47	47	48	48	47
Cost per Auto Commuter (\$)	965	928	874	835	827	814
Rank	37	39	41	43	42	43
Truck Congestion						
Annual Person-Hours of Delay (000)	1,343	1,282	1,214	1,169	1,141	1,112
Rank	47	47	47	47	47	47
Annual Gallons of Wasted Fuel (000)	2,988	2,895	2,790	2,710	2,668	2,646
Rank	46	47	47	47	47	47
Annual Congestion Cost (\$ million)	69	64	58	57	52	50
Rank	46	47	47	48	48	47

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

Mobility Data for Buffalo NY

Inventory Measures	2011	2010	2009	2008	2007	2006
Urban Area Information						
Population (1000s)	1,000	1,015	1,030	1,045	1,060	1,065
Rank	45	43	43	41	39	39
Commuters (1000s)	455	459	456	458	458	459
Daily Vehicle-Miles of Travel (1000s)						
Freeway	6,931	6,938	6,700	6,595	6,760	6,870
Arterial Streets	9,604	9,613	9,400	9,540	9,645	9,235
Cost Components						
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)	3.65	2.95	2.47	3.55	3.19	2.82
Diesel (\$/gallon)	3.99	3.21	2.90	4.52	3.71	3.03
System Performance	2011	2010	2009	2008	2007	2006
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	12,382	12,159	12,103	12,002	12,441	12,247
Rank	47	47	47	47	48	46
Fuel per Peak Auto Commuter (gallons)	20	20	20	19	20	20
Rank	32	29	18	37	28	28
Annual Delay						
Total Delay (1000s of person-hours)	25,786	24,856	24,279	22,930	23,770	23,398
Rank	47	47	47	48	47	47
Delay per Auto Commuter (pers-hrs)	43	41	40	37	36	36
Rank	38	42	43	54	59	56
Travel Time Index						
Rank	1.16	1.16	1.16	1.16	1.16	1.16
Rank	59	58	58	63	63	62
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	503	463	441	433	428	405
Rank	47	47	47	48	47	47
Cost per Auto Commuter (\$)	818	814	809	756	816	824
Rank	42	44	43	47	42	38
Truck Congestion						
Annual Person-Hours of Delay (000)	1,083	1,044	1,020	963	998	983
Rank	47	47	47	48	47	47
Annual Gallons of Wasted Fuel (000)	2,625	2,578	2,566	2,544	2,638	2,596
Rank	47	47	47	47	48	46
Annual Congestion Cost (\$ million)	53	47	45	46	44	41
Rank	47	47	47	47	47	46

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

Mobility Data for Buffalo NY

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	1,070	1,085	1,095	1,100	1,110	1,110
Rank	38	38	37	37	37	36
Commuters (1000s)	457	462	464	459	456	449
Daily Vehicle-Miles of Travel (1000s)						
Freeway	6,720	6,725	6,720	6,435	6,380	6,365
Arterial Streets	8,700	8,300	8,000	7,850	7,800	7,890
Cost Components						
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)	2.40	2.14	1.62	1.49	1.72	1.64
Diesel (\$/gallon)	2.66	2.14	1.73	1.51	1.70	1.65
System Performance	2005	2004	2003	2002	2001	2000
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	12,233	12,154	12,071	11,957	11,467	11,219
Rank	45	44	41	41	41	40
Fuel per Peak Auto Commuter (gallons)	20	20	20	21	19	19
Rank	25	21	17	12	13	11
Annual Delay						
Total Delay (1000s of person-hours)	23,371	23,221	23,063	22,844	21,908	21,434
Rank	46	45	45	45	45	44
Delay per Auto Commuter (pers-hrs)	36	36	35	35	34	33
Rank	53	52	53	51	51	56
Travel Time Index						
Rank	1.16	1.15	1.15	1.15	1.15	1.14
Rank	61	66	64	61	58	65
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	388	370	352	339	323	306
Rank	46	45	45	45	44	44
Cost per Auto Commuter (\$)	850	873	893	903	879	884
Rank	38	35	30	27	27	22
Truck Congestion						
Annual Person-Hours of Delay (000)	982	975	969	959	920	900
Rank	46	45	45	45	45	44
Annual Gallons of Wasted Fuel (000)	2,593	2,577	2,559	2,535	2,431	2,378
Rank	45	44	41	41	41	40
Annual Congestion Cost (\$ million)	38	36	33	31	30	28
Rank	46	45	45	44	43	40

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Mobility Data for Buffalo NY

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	1,100	1,090	1,080	1,075	1,070	1,070
Rank	36	36	37	36	36	35
Commuters (1000s)	438	427	416	407	399	392
Daily Vehicle-Miles of Travel (1000s)						
Freeway	6,050	5,850	5,700	5,530	5,565	5,645
Arterial Streets	8,115	7,950	7,500	7,100	6,800	6,500
Cost Components						
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)	1.19	1.15	1.31	1.37	1.27	1.15
Diesel (\$/gallon)	1.24	1.29	1.39	1.28	1.19	1.07
System Performance	1999	1998	1997	1996	1995	1994
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	10,432	9,146	7,898	7,128	6,813	6,549
Rank	40	40	45	44	42	40
Fuel per Peak Auto Commuter (gallons)	19	17	14	13	11	12
Rank	9	13	26	29	41	21
Annual Delay						
Total Delay (1000s of person-hours)	19,931	17,474	15,090	13,618	13,016	12,512
Rank	44	46	47	49	49	47
Delay per Auto Commuter (pers-hrs)	32	28	25	23	22	22
Rank	57	66	73	74	76	72
Travel Time Index						
Rank	1.14	1.12	1.11	1.10	1.10	1.09
Rank	61	72	72	76	73	75
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	271	233	200	177	164	153
Rank	44	46	46	49	48	45
Cost per Auto Commuter (\$)	849	759	667	618	609	602
Rank	22	28	39	42	38	33
Truck Congestion						
Annual Person-Hours of Delay (000)	837	734	634	572	547	525
Rank	44	46	47	49	49	47
Annual Gallons of Wasted Fuel (000)	2,212	1,939	1,674	1,511	1,444	1,388
Rank	40	40	45	44	42	40
Annual Congestion Cost (\$ million)	24	21	18	16	15	14
Rank	40	44	46	47	46	44

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Mobility Data for Buffalo NY

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	1,070	1,070	1,065	1,065	1,060	1,055
Rank	35	35	34	34	34	33
Commuters (1000s)	386	380	372	366	362	356
Daily Vehicle-Miles of Travel (1000s)						
Freeway	5,580	5,365	5,265	4,950	5,000	4,890
Arterial Streets	6,200	6,025	5,840	5,790	5,600	5,500
Cost Components						
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)	1.21	1.24	1.21	1.07	1.13	1.04
Diesel (\$/gallon)	1.13	1.00	1.35	1.09	1.05	0.97
System Performance	1993	1992	1991	1990	1989	1988
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	6,086	5,700	5,489	5,287	4,917	4,322
Rank	40	41	39	38	38	39
Fuel per Peak Auto Commuter (gallons)	11	9	9	10	9	8
Rank	22	45	27	14	19	20
Annual Delay						
Total Delay (1000s of person-hours)	11,628	10,891	10,488	10,102	9,395	8,258
Rank	48	47	43	41	40	41
Delay per Auto Commuter (pers-hrs)	20	19	19	18	17	15
Rank	74	74	68	66	62	67
Travel Time Index						
Rank	74	76	71	63	66	60
Commuter Stress Index						
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	139	127	119	110	98	82
Rank	48	45	41	41	40	41
Cost per Auto Commuter (\$)	575	554	550	554	543	505
Rank	32	31	28	26	26	28
Truck Congestion						
Annual Person-Hours of Delay (000)	488	457	440	424	395	347
Rank	48	47	43	41	40	41
Annual Gallons of Wasted Fuel (000)	1,290	1,208	1,164	1,121	1,042	916
Rank	40	41	39	38	38	39
Annual Congestion Cost (\$ million)	13	12	12	11	10	9
Rank	44	44	41	40	39	39

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Mobility Data for Buffalo NY

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	1,045	1,040	1,030	1,030	1,050	1,075
Rank	33	31	31	31	31	30
Commuters (1000s)	350	344	338	336	339	343
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,680	4,475	4,280	4,000	3,775	3,980
Arterial Streets	5,300	5,150	5,000	4,900	4,750	4,630
Cost Components						
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)	1.05	1.02	1.34	1.35	1.38	1.44
Diesel (\$/gallon)	0.97	0.95	1.24	1.25	1.28	1.34
System Performance	1987	1986	1985	1984	1983	1982
Congested Travel (% of peak VMT)	--	--	--	--	--	--
Congested System (% of lane-miles)	--	--	--	--	--	--
Congested Time (number of "Rush Hours")	--	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	3,870	3,745	3,662	3,271	2,935	2,878
Rank	40	40	38	39	38	38
Fuel per Peak Auto Commuter (gallons)	6	6	7	6	5	5
Rank	32	28	15	20	22	16
Annual Delay						
Total Delay (1000s of person-hours)	7,394	7,156	6,996	6,250	5,607	5,499
Rank	42	41	40	40	41	40
Delay per Auto Commuter (pers-hrs)	14	14	13	12	11	10
Rank	64	57	56	56	56	58
Travel Time Index						
Rank	1.06	1.06	1.06	1.05	1.05	1.04
Rank	66	57	54	57	55	61
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	71	66	65	56	49	47
Rank	42	41	40	40	39	39
Cost per Auto Commuter (\$)	472	471	468	433	408	415
Rank	29	27	26	27	27	23
Truck Congestion						
Annual Person-Hours of Delay (000)	311	301	294	262	235	231
Rank	42	41	40	40	41	39
Annual Gallons of Wasted Fuel (000)	820	794	776	693	622	610
Rank	40	40	38	39	38	38
Annual Congestion Cost (\$ million)	8	7	7	6	6	6
Rank	39	40	39	40	38	35

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