Performance Measure Summary - Grand Rapids MI

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 Grand Rapids MI

Inventory Measures	2017	2016	2015	2014	2013	2012
Urban Area Information						
Population (1000s)	630	630	630	630	620	615
Rank	66	66	66	65	66	66
Commuters (1000s)	333	333	333	333	323	320
Daily Vehicle-Miles of Travel (1000s)						
Freeway	6,107	5,886	5,686	5,461	5,480	5,305
Arterial Streets	7,873	7,649	7,589	7,441	7,312	7,410
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 ($/gallon)	2.45	2.23	2.22	3.30	3.65	3.68
Diesel ($/gallon)	2.58	2.31	2.52	3.72	3.96	3.93
System Performance	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**
Congested Travel (% of peak VMT)	1.7	--	--	--	--	--
Congested System (% of lane-miles)	6.6	--	--	--	--	--
Congested Time (number of "Rush Hours")	0.8	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	8,032	7,864	7,788	7,657	7,596	7,310
Rank	62	62	62	62	62	63
Fuel per Peak Auto Commuter (gallons)	16	16	16	16	17	18
Rank	77	76	73	70	64	52
Annual Delay						
Total Delay (1000s of person-hours)	19,417	18,775	18,276	17,811	17,361	16,557
Rank	61	61	61	61	61	61
Delay per Auto Commuter (pers-hrs)	41	41	40	40	39	40
Rank	70	68	68	63	63	55
Travel Time Index	1.13	1.13	1.13	1.13	1.13	1.14
Rank	83	83	83	86	87	79
Commuter Stress Index	1.14	--	--	--	--	--
Rank	86	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	1.25	--	--	--	--	--
Rank	84	--	--	--	--	--
Congestion Cost						
Total Cost ($ millions)	394	375	359	357	344	323
Rank	62	62	62	61	61	61
Cost per Auto Commuter ($)	716	697	674	655	644	622
Rank	77	77	76	76	76	77
Truck Congestion						
Annual Person-Hours of Delay (000)	815	789	768	748	729	695
Rank	61	61	61	61	61	61
Annual Gallons of Wasted Fuel (000)	1,703	1,667	1,651	1,623	1,610	1,550
Rank	62	62	62	62	62	63
Annual Congestion Cost ($ million)	42	39	36	35	33	30
Rank	61	61	61	61	61	61

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

Mobility Data for Grand Rapids MI

Inventory Measures	2011	2010	2009	2008	2007	2006
Urban Area Information						
Population (1000s)	610	619	605	600	595	595
Rank	66	66	66	67	66	65
Commuters (1000s)	312	315	307	303	299	297
Daily Vehicle-Miles of Travel (1000s)						
Freeway	5,624	5,527	5,300	5,100	5,090	4,945
Arterial Streets	7,725	7,800	8,201	8,455	8,560	8,585
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 ($/gallon)	3.46	2.38	2.23	3.51	3.06	2.64
Diesel ($/gallon)	3.74	2.94	2.55	4.22	3.42	2.85
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)	7,095	6,869	6,616	7,016	6,788	6,514
Rank	64	64	68	64	66	66
Fuel per Peak Auto Commuter (gallons)	18	17	15	18	18	16
Rank	49	61	62	49	49	64
Annual Delay						
Total Delay (1000s of person-hours)	15,781	14,998	14,175	14,317	13,852	13,292
Rank	61	64	65	62	64	65
Delay per Auto Commuter (pers-hrs)	39	37	37	36	36	35
Rank	54	58	57	61	59	62
Travel Time Index	1.14	1.14	1.14	1.15	1.15	1.15
Rank	77	73	74	72	72	72
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost ($ millions)	305	275	254	268	247	228
Rank	61	64	65	62	64	65
Cost per Auto Commuter ($)	611	599	576	577	579	573
Rank	76	79	80	78	83	85
Truck Congestion						
Annual Person-Hours of Delay (000)	663	630	595	601	582	558
Rank	61	64	64	62	64	65
Annual Gallons of Wasted Fuel (000)	1,504	1,456	1,403	1,487	1,439	1,381
Rank	64	64	68	64	66	66
Annual Congestion Cost ($ million)	32	28	25	28	25	22
Rank	61	63	66	61	64	65

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

Mobility Data for Grand Rapids MI

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	595	590	585	570	555	540
Rank	65	65	65	64	64	65
Commuters (1000s)	295	291	287	277	266	255
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,885	4,895	4,515	4,300	4,100	4,000
Arterial Streets	8,150	7,715	7,300	7,005	6,750	6,440
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 ($/gallon)	2.33	1.90	1.51	1.41	1.50	1.63
Diesel ($/gallon)	2.51	1.94	1.49	1.37	1.54	1.52
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)	6,350	6,133	6,062	5,757	5,714	5,562
Rank	66	67	65	66	63	62
Fuel per Peak Auto Commuter (gallons)	17	15	16	14	14	15
Rank	48	65	49	61	54	40
Annual Delay						
Total Delay (1000s of person-hours)	12,958	12,516	12,371	11,749	11,661	11,349
Rank	65	65	64	65	62	62
Delay per Auto Commuter (pers-hrs)	35	34	34	34	35	35
Rank	59	60	58	54	45	45
Travel Time Index	1.15	1.14	1.14	1.14	1.14	1.15
Rank	71	74	71	69	68	56
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost ($ millions)	213	197	187	173	170	161
Rank	65	65	64	65	61	61
Cost per Auto Commuter ($)	576	576	584	568	572	570
Rank	82	81	76	76	72	70
Truck Congestion						
Annual Person-Hours of Delay (000)	544	526	520	493	490	477
Rank	65	65	64	65	62	62
Annual Gallons of Wasted Fuel (000)	1,346	1,300	1,285	1,221	1,211	1,179
Rank	66	67	65	66	63	62
Annual Congestion Cost ($ million)	21	19	17	16	15	15
Rank	64	63	64	61	62	59

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

Mobility Data for Grand Rapids MI

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	525	510	500	490	480	470
Rank	65	67	67	69	69	69
Commuters (1000s)	245	235	228	220	213	206
Daily Vehicle-Miles of Travel (1000s)						
Freeway	3,900	3,800	3,550	3,345	3,270	3,360
Arterial Streets	6,280	6,165	5,880	5,840	5,810	5,765
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 ($/gallon)	1.13	1.11	1.12	1.29	1.12	1.02
Diesel ($/gallon)	1.10	1.13	1.22	1.39	1.20	1.10
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)	5,214	4,838	4,463	4,071	3,808	3,582
Rank	62	63	64	64	65	64
Fuel per Peak Auto Commuter (gallons)	14	13	12	11	10	10
Rank	42	42	47	49	52	45
Annual Delay						
Total Delay (1000s of person-hours)	10,640	9,872	9,107	8,308	7,770	7,309
Rank	62	63	63	65	66	65
Delay per Auto Commuter (pers-hrs)	34	33	31	29	28	27
Rank	45	46	49	54	52	51
Travel Time Index	1.14	1.14	1.14	1.13	1.12	1.12
Rank	61	55	47	50	59	51
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost ($ millions)	144	131	119	107	97	89
Rank	62	63	63	65	65	65
Cost per Auto Commuter ($)	551	527	491	458	442	430
Rank	70	70	72	72	72	71
Truck Congestion						
Annual Person-Hours of Delay (000)	447	415	383	349	326	307
Rank	62	63	63	65	65	65
Annual Gallons of Wasted Fuel (000)	1,105	1,026	946	863	807	759
Rank	62	63	64	64	65	64
Annual Congestion Cost ($ million)	13	12	11	10	9	8
Rank	60	62	62	63	64	64

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Mobility Data for Grand Rapids MI

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	460	450	445	440	430	420
Rank	69	69	69	68	68	68
Commuters (1000s)	199	192	188	183	178	172
Daily Vehicle-Miles of Travel (1000s)						
Freeway	3,490	3,180	2,800	2,635	2,530	2,370
Arterial Streets	5,670	5,350	4,990	4,805	4,670	4,590
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 ($/gallon)	1.10	1.08	1.13	1.10	1.12	1.03
Diesel ($/gallon)	1.18	1.16	1.27	1.14	1.06	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)	3,386	2,966	2,655	2,191	1,819	1,731
Rank	64	65	67	71	72	70
Fuel per Peak Auto Commuter (gallons)	9	8	8	6	5	4
Rank	49	53	45	60	63	71
Annual Delay						
Total Delay (1000s of person-hours)	6,909	6,052	5,417	4,471	3,711	3,532
Rank	65	66	69	69	70	69
Delay per Auto Commuter (pers-hrs)	27	24	22	19	16	16
Rank	45	53	53	64	68	61
Travel Time Index	1.12	1.11	1.10	1.08	1.07	1.07
Rank	44	49	51	63	66	60
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost ($ millions)	82	70	61	48	38	35
Rank	65	66	69	69	71	69
Cost per Auto Commuter ($)	418	376	346	301	262	260
Rank	67	71	72	78	80	78
Truck Congestion						
Annual Person-Hours of Delay (000)	290	254	228	188	156	148
Rank	65	66	69	69	69	69
Annual Gallons of Wasted Fuel (000)	718	629	563	464	386	367
Rank	64	65	67	71	72	70
Annual Congestion Cost ($ million)	8	7	6	5	4	4
Rank	61	63	64	67	69	64

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Mobility Data for Grand Rapids MI

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	415	410	400	390	380	370
Rank	67	67	67	66	66	66
Commuters (1000s)	169	166	160	155	150	144
Daily Vehicle-Miles of Travel (1000s)						
Freeway	2,115	2,060	1,955	1,785	1,700	1,625
Arterial Streets	4,485	4,405	3,875	3,575	3,315	3,160
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 ($/gallon)	1.04	1.01	1.32	1.34	1.37	1.43
Diesel ($/gallon)	0.98	0.95	1.25	1.26	1.29	1.35
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)	1,680	1,518	1,272	1,017	760	719
Rank	67	70	71	72	76	75
Fuel per Peak Auto Commuter (gallons)	4	5	4	4	2	1
Rank	61	40	50	41	69	82
Annual Delay						
Total Delay (1000s of person-hours)	3,427	3,098	2,596	2,075	1,551	1,467
Rank	68	68	70	72	77	75
Delay per Auto Commuter (pers-hrs)	15	14	12	10	8	8
Rank	60	57	63	70	76	73
Travel Time Index	1.07	1.06	1.05	1.04	1.03	1.03
Rank	55	57	64	75	80	76
Commuter Stress Index	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost ($ millions)	33	29	24	19	13	12
Rank	67	67	70	71	76	75
Cost per Auto Commuter ($)	263	247	209	174	139	136
Rank	75	74	79	84	87	87
Truck Congestion						
Annual Person-Hours of Delay (000)	144	130	109	87	65	62
Rank	68	68	70	72	77	75
Annual Gallons of Wasted Fuel (000)	356	322	270	216	161	152
Rank	67	70	71	72	76	75
Annual Congestion Cost ($ million)	3	3	3	2	2	1
Rank	69	67	65	70	66	75

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