Performance Measure Summary - Cleveland OH

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2020. 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 2020 (estimated at \$20.17 per hour of person travel and \$55.24 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.

Annual Greenhouse Gases (CO2) Produced -Tons of CO2 produced from all vehicle travel.

Excess Greenhouse Gases (CO2) Produced due to Congestion-Tons of CO2 produced due to congested portion of travel. The excess CO2 is a subset of the total CO2 produced.

Inventory Measures	2020	2019	2018	2017	2016	2015
Urban Area Information						
Population (1000s)	1,765	1,765	1,765	1,760	1,760	1,765
Rank	29	29	28	28	28	28
Commuters (1000s)	874	874	874	872	872	874
Daily Vehicle-Miles of Travel (1000s)						
Freeway	15,715	19,049	19,017	18,958	18,505	17,590
Arterial Streets	11,312	13,711	13,503	13,290	12,946	13,038
Cost Components						
Value of Time (\$/hour)	20.17	19.14	18.71	18.12	17.91	17.69
Commercial Cost (\$/hour)	55.24	61.03	54.71	52.14	50.20	46.87
Gasoline (\$/gallon)	2.20	2.78	2.70	2.29	2.17	2.18
Diesel (\$/gallon)	2.76	2.96	3.14	2.53	2.29	2.49
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)				15.7		
Congested System (% of lane-miles)				9.7		
Congested Time (number of "Rush Hours")				1.5		
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	17,308	27,628	26,727	26,716	26,609	26,158
Rank	20	28	28	25	25	25
Fuel per Peak Auto Commuter (gallons)	15	24	23	23	23	22
Rank	9	27	31	29	27	29
Annual Delay						
Total Delay (1000s of person-hours)	33,300	53,157	52,272	52,070	50,983	49,262
Rank	29	32	33	33	33	33
Delay per Auto Commuter (pers-hrs)	29	47	46	46	46	44
Rank	29	51	49	47	47	49
Travel Time Index	1.08	1.14	1.14	1.14	1.15	1.15
Rank	44	79	76	79	69	67
Commuter Stress Index	1.09	1.17	1.18	1.15		
Rank	44	67	63	78		
Freeway Planning Time Index (95th Pctile)		1.33	1.33	1.35		
Rank		66	63	64		
Congestion Cost						
Total Cost (\$ millions)	760	1,187	1,154	1,130	1,088	1,036
Rank	29	32	33	33	33	33
Cost per Auto Commuter (\$)	686	1,072	1,043	1,023	1,008	968
Rank	21	39	39	36	36	37
Truck Congestion						
Annual Person-Hours of Delay (000)	1,702	2,274	2,336	2,355	2,306	2,228
Rank	30	5 042	32	30	30	30
Annual Gallons of Wasted Fuel (000)	3,775	5,043	4,928	5,664	5,641	5,545
Rank	23	30	29	25	25	25
Annual Congestion Cost (\$ million)	93	138	131	129	121	111
Rank	29	33	32	30	30	30
Annual Greenhouse Gases (CO2) Produced	151 040	274 222			ı	
Excess Due to Congestion (tons)	171,848	274,320				
Rank	20	28				
Due to All Travel (tons)	6,705,836	10,704,478				
Rank	13	16				
Truck Annual Greenhouse Gases (CO2) Produced	41 202	55 174		1	ı	
Excess Due to Truck Congestion (tons)	41,303	55,174				
Rank	23	30				
Due to Truck Travel (tons)	2,684,766	3,586,421				
Rank	6	8				

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

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	1,765	1,765	1,770	1,775	1,780	1,800
Rank	28	29	28	28	27	24
Commuters (1000s)	874	880	886	891	897	906
Daily Vehicle-Miles of Travel (1000s)						
Freeway	18,076	17,868	16,880	18,569	18,635	17,900
Arterial Streets	12,706	12,862	12,120	12,222	12,265	12,000
Cost Components						
Value of Time (\$/hour)	17.67	17.39	17.14	16.79	16.28	16.01
Commercial Cost (\$/hour)	44.82	41.23	39.66	44.62	42.50	41.83
Gasoline (\$/gallon)	3.16	3.48	3.58	3.25	2.64	2.19
Diesel (\$/gallon)	3.67	3.91	3.87	3.69	2.96	2.58
System Performance	2014	2013	2012	2011	2010	2009
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	25,752	25,645	25,445	25,244	24,559	23,772
Rank	25	25	25	25	25	25
Fuel per Peak Auto Commuter (gallons)	22	22	21	22	22	19
Rank	24	24	28	18	20	27
Annual Delay						
Total Delay (1000s of person-hours)	48,077	47,455	46,252	45,060	43,033	40,875
Rank	33	32	32	32	32	32
Delay per Auto Commuter (pers-hrs)	43	43	41	41	39	36
Rank	49	46	50	45	53	61
Travel Time Index	1.15	1.15	1.15	1.14	1.14	1.14
Rank	68	68	69	75	71	72
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	1,035	1,010	973	935	852	788
Rank	32	32	32	32	32	32
Cost per Auto Commuter (\$)	939	937	924	929	916	886
Rank	37	35	34	32	34	35
Truck Congestion	0.174	2.146	2 002	2.020	1046	1.040
Annual Person-Hours of Delay (000)	2,174	2,146	2,092	2,038	1,946	1,849
Rank	30 5.460	30 5 437	5 304	5 252	5 207	5 040
Annual Gallons of Wasted Fuel (000) Rank	5,460	5,437 25	5,394 25	5,352 25	5,207 25	5,040
Rank Annual Congestion Cost (\$ million)	25	104	25 99	105	93	25 85
Rank	30	30	29	29	28	28
Annual Greenhouse Gases (CO2) Produced	30	30	29	2.3	20	20
Excess Due to Congestion (tons)				I		
Rank						
Due to All Travel (tons)						 -
Rank				<u></u>		
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)						_
Rank						 -
Due to Truck Travel (tons)						
Rank				 		<u></u>
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^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2008	2007	2006	2005	2004	2003
Urban Area Information						
Population (1000s)	1,810	1,820	1,820	1,825	1,825	1,820
Rank	24	23	23	23	23	22
Commuters (1000s)	907	911	909	905	902	896
Daily Vehicle-Miles of Travel (1000s)						
Freeway	17,225	18,120	18,205	18,150	18,375	17,390
Arterial Streets	11,930	12,005	12,065	12,185	12,020	11,800
Cost Components			,			
Value of Time (\$/hour)	16.07	15.47	15.06	14.58	14.10	13.73
Commercial Cost (\$/hour)	40.77	39.30	37.88	36.51	35.19	33.92
Gasoline (\$/gallon)	3.40	2.88	2.58	2.24	1.81	1.52
Diesel (\$/gallon)	4.17	3.35	2.83	2.48	1.94	1.49
System Performance	2008	2007	2006	2005	2004	2003
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	24,720	24,305	23,805	23,921	23,908	22,292
Rank	25	25	25	25	24	24
Fuel per Peak Auto Commuter (gallons)	21	20	20	20	21	19
Rank	24	28	28	25	14	23
Annual Delay						
Total Delay (1000s of person-hours)	40,482	39,801	38,983	39,174	39,151	36,506
Rank	32	31	31	30	30	31
Delay per Auto Commuter (pers-hrs)	35	35	34	34	34	32
Rank	66	69	69	67	60	69
Travel Time Index	1.14	1.14	1.13	1.14	1.14	1.13
Rank	76	77	81	73	71	75
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	817	762	719	693	660	592
Rank	32	31	30	30	30	31
Cost per Auto Commuter (\$)	867	887	893	927	960	918
Rank	37	37	36	34	29	32
Truck Congestion						
Annual Person-Hours of Delay (000)	1,831	1,800	1,763	1,772	1,771	1,651
Rank	29	30	28	28	28	28
Annual Gallons of Wasted Fuel (000)	5,241	5,153	5,047	5,071	5,068	4,726
Rank	25	25	25	25	25	25
Annual Congestion Cost (\$ million)	92	84	77	73	68	59
Rank	27	27	28	28	28	28
Annual Greenhouse Gases (CO2) Produced					1	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					, ,	
Excess Due to Truck Congestion (tons)						
Rank						
			· I		, I	
Due to Truck Travel (tons) Rank						

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

Inventory Measures	2002	2001	2000	1999	1998	1997
Urban Area Information						
Population (1000s)	1,820	1,815	1,805	1,800	1,790	1,785
Rank	22	22	22	22	22	22
Commuters (1000s)	881	866	848	833	815	800
Daily Vehicle-Miles of Travel (1000s)					Ì	
Freeway	16,800	16,750	17,285	17,260	17,120	16,660
Arterial Streets	11,490	11,310	11,105	10,795	10,605	10,255
Cost Components	,	,	,	· ·	,	
Value of Time (\$/hour)	13.43	13.22	12.85	12.43	12.17	11.98
Commercial Cost (\$/hour)	32.69	31.51	30.38	29.28	28.89	28.50
Gasoline (\$/gallon)	1.38	1.30	1.55	1.14	1.11	1.13
Diesel (\$/gallon)	1.36	1.49	1.53	1.15	1.17	1.25
System Performance	2002	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)						1))//
` ` `						
Congested System (% of lane-miles) Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	22,370	22,867	23,041	23,238	23,099	22,880
Rank	24	21	19	18	17	15
Fuel per Peak Auto Commuter (gallons)	19	19	19	20	19	20
Rank	18	13	11	8	8	8
Annual Delay						
Total Delay (1000s of person-hours)	36,633	37,447	37,731	38,055	37,827	37,469
Rank	30	29	26	23	23	23
Delay per Auto Commuter (pers-hrs)	33	34	35	35	36	36
Rank	59	51	45	41	35	28
Travel Time Index	1.13	1.13	1.14	1.14	1.14	1.14
Rank	75	73	62	58	53	46
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	578	580	574	551	537	525
Rank	30	29	25	23	23	23
Cost per Auto Commuter (\$)	943	977	1,011	1,053	1,072	1,077
Rank	30	20	18	15	13	13
Truck Congestion						
Annual Person-Hours of Delay (000)	1,657	1,694	1,706	1,721	1,711	1,695
Rank	27	26	25	25	24	24
Annual Gallons of Wasted Fuel (000)	4,742	4,848	4,885	4,926	4,897	4,851
Rank	24	21	20	19	17	15
Annual Congestion Cost (\$ million)	57	57	56	53	52	51
Rank	26	25	25	24	23	23
Annual Greenhouse Gases (CO2) Produced	-	-	-		-	
Excess Due to Congestion (tons)						
Rank				<u></u>		 -
Due to All Travel (tons)						
Rank						 -
Truck Annual Greenhouse Gases (CO2) Produced					1	
Excess Due to Truck Congestion (tons)						
Rank						
I I I I I I I I I I I I I I I I I I I						
Due to Truck Travel (tons) Rank						

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

Inventory Measures	1996	1995	1994	1993	1992	1991
Urban Area Information						
Population (1000s)	1,775	1,770	1,770	1,765	1,765	1,760
Rank	22	22	21	21	21	21
Commuters (1000s)	784	769	758	743	732	719
Daily Vehicle-Miles of Travel (1000s)						
Freeway	16,020	15,695	15,310	14,905	14,125	13,750
Arterial Streets	10,020	9,500	9,215	8,785	8,490	8,210
Cost Components						
Value of Time (\$/hour)	11.71	11.37	11.06	10.78	10.47	10.17
Commercial Cost (\$/hour)	28.12	27.75	27.38	27.02	26.66	26.30
Gasoline (\$/gallon)	1.28	1.12	1.08	1.09	1.11	1.13
Diesel (\$/gallon)	1.39	1.22	1.17	1.19	1.19	1.25
System Performance	1996	1995	1994	1993	1992	1991
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	22,227	21,158	19,552	17,320	15,035	13,610
Rank	15	15	15	16	17	18
Fuel per Peak Auto Commuter (gallons)	20	19	18	17	14	13
Rank	7	7	8	8	8	9
Annual Delay						
Total Delay (1000s of person-hours)	36,400	34,648	32,018	28,362	24,622	22,288
Rank	23	22	22	22	23	23
Delay per Auto Commuter (pers-hrs)	35	34	32	29	25	23
Rank	25	24	27	33	45	49
Travel Time Index	1.14	1.14	1.13	1.11	1.10	1.09
Rank	45	41	43	52	58	61
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	503	462	416	360	305	269
Rank	23	22	22	22	23	23
Cost per Auto Commuter (\$)	1,071	1,051	1,000	909	814	758
Rank	12	12	12	12	17	19
Truck Congestion						
Annual Person-Hours of Delay (000)	1,646	1,567	1,448	1,283	1,114	1,008
Rank	23	23	23	23	23	23
Annual Gallons of Wasted Fuel (000)	4,712	4,486	4,145	3,672	3,187	2,885
Rank	15	15	15	16	17	19
Annual Congestion Cost (\$ million)	50	46	42	37	31	28
Rank	21	22	22	23	23	23
Annual Greenhouse Gases (CO2) Produced					, ,	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					, ,	
Excess Due to Truck Congestion (tons)						
Rank						
B			ı			
Due to Truck Travel (tons) Rank						

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

Inventory Measures	1990	1989	1988	1987	1986	1985
Urban Area Information						
Population (1000s)	1,760	1,755	1,755	1,750	1,750	1,750
Rank	21	20	20	20	19	19
Commuters (1000s)	708	700	693	685	679	673
Daily Vehicle-Miles of Travel (1000s)						
Freeway	13,660	13,175	12,670	11,115	10,705	10,305
Arterial Streets	7,905	7,810	7,590	7,000	6,775	6,585
Cost Components						
Value of Time (\$/hour)	9.75	9.25	8.83	8.48	8.18	8.03
Commercial Cost (\$/hour)	25.95	25.60	25.26	24.93	24.60	24.27
Gasoline (\$/gallon)	1.06	1.08	1.00	1.00	0.98	1.28
Diesel (\$/gallon)	1.10	1.05	0.97	0.97	0.95	1.24
System Performance	1990	1989	1988	1987	1986	1985
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	11,968	9,731	7,818	6,275	5,541	5,065
Rank	19	22	26	26	28	28
Fuel per Peak Auto Commuter (gallons)	12	10	9	6	5	4
Rank	9	11	13	32	40	50
Annual Delay						
Total Delay (1000s of person-hours)	19,599	15,935	12,802	10,276	9,074	8,294
Rank	25	28	31	34	35	36
Delay per Auto Commuter (pers-hrs)	21	17	14	11	10	9
Rank	52	62	75	82	83	83
Travel Time Index	1.08	1.07	1.05	1.04	1.04	1.04
Rank	62	65	83	88	85	81
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	227	177	136	105	90	82
Rank	25	27	31	34	34	35
Cost per Auto Commuter (\$)	698	599	508	425	389	364
Rank	20	23	33	44	50	47
Truck Congestion						
Annual Person-Hours of Delay (000)	886	721	579	465	410	375
Rank	24	27	28	31	31	30
Annual Gallons of Wasted Fuel (000)	2,537	2,063	1,657	1,330	1,175	1,074
Rank	20	22	25	26	27	27
Annual Congestion Cost (\$ million)	24	19	15	12	11	10
Rank	23	27	27	31	30	30
Annual Greenhouse Gases (CO2) Produced					, ,	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					, ,	
Excess Due to Truck Congestion (tons)						
Rank						
Due to Truck Travel (tons)						
Rank					1	

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

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	1,750	1,750	1,750
Rank	18	17	17
Commuters (1000s)	666	662	655
Daily Vehicle-Miles of Travel (1000s)			
Freeway	10,600	10,520	10,000
Arterial Streets	6,460	6,310	6,205
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.29	1.32	1.38
Diesel (\$/gallon)	1.26	1.29	1.34
System Performance	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)	4,513	4,004	3,522
Rank	28	28	29
Fuel per Peak Auto Commuter (gallons)	5	3	3
Rank	27	46	34
Annual Delay		.0	
Total Delay (1000s of person-hours)	7,390	6,556	5,767
Rank	35	36	38
Delay per Auto Commuter (pers-hrs)	8	7	6
Rank	83	85	90
Travel Time Index	1.03	1.03	1.03
Rank	85	80	76
Commuter Stress Index			70
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	71	61	53
Rank	34	36	38
Cost per Auto Commuter (\$)	333	308	281
Rank	47	52	53
Truck Congestion	.,	52	
Annual Person-Hours of Delay (000)	334	297	261
Rank	31	31	34
Annual Gallons of Wasted Fuel (000)	957	849	747
Rank	27	27	29
Annual Congestion Cost (\$ million)	9	8	7
Rank	30	30	30
Annual Greenhouse Gases (CO2) Produced			
Excess Due to Congestion (tons)			
Rank			
Due to All Travel (tons)			
Rank			
Truck Annual Greenhouse Gases (CO2) Produced			
Excess Due to Truck Congestion (tons)			
Rank			
Due to Truck Travel (tons)			
Rank			
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^{*} Note: Zeroes in the table reflect values less than 0.5.