Performance Measure Summary - Nashville-Davidson TN

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)	1,220	1,220	1,215	1,215	1,210	1,205
Rank	39	39	39	39	39	39
Commuters (1000s)	629	629	626	626	623	620
Daily Vehicle-Miles of Travel (1000s)						
Freeway	19,404	22,252	21,350	21,128	19,948	18,785
Arterial Streets	13,047	14,962	14,811	14,619	13,972	14,669
Cost Components	10,500	- 1,5 0-	2.1,022	- 1,0 - 2	20,5.1	- 1,002
Value of Time (\$/hour)	20.17	19.14	18.71	18.12	17.91	17.69
Commercial Cost (\$/hour)	55.24	49.49	54.71	52.14	50.20	46.87
Gasoline (\$/gallon)	2.15	2.37	2.65	2.14	2.00	2.06
Diesel (\$\(\frac{9}{2}\)gallon)	2.68	2.84	3.05	2.35	2.13	2.37
System Performance		2019	2018	2017	2016	
	2020	2019				2015
Congested Travel (% of peak VMT)				24.8		
Congested System (% of lane-miles)				16.6		
Congested Time (number of "Rush Hours")				3.5		
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	10,826	25,006	23,487	22,265	21,367	21,056
Rank	37	30	31	33	33	33
Fuel per Peak Auto Commuter (gallons)	13	29	27	26	25	25
Rank	28	14	15	15	16	15
Annual Delay						
Total Delay (1000s of person-hours)	25,770	59,525	55,401	52,249	51,038	49,865
Rank	35	30	31	32	32	32
Delay per Auto Commuter (pers-hrs)	28	66	61	58	57	57
Rank	36	15	20	24	22	22
Travel Time Index	1.06	1.23	1.23	1.22	1.22	1.22
Rank	75	31	32	34	33	34
Commuter Stress Index	1.07	1.35	1.34	1.30		
Rank	75	18	17	23		
Freeway Planning Time Index (95th Pctile)		1.72	1.72	1.70		
Rank		32	28	31		
Congestion Cost						
Total Cost (\$ millions)	595	1,323	1,252	1,155	1,102	1,052
Rank	33	30	30	32	32	32
Cost per Auto Commuter (\$)	659	1,465	1,391	1,284	1,262	1,226
Rank	26	15	16	20	20	19
Truck Congestion						
Annual Person-Hours of Delay (000)	1,789	4,350	3,874	3,594	3,324	2,994
Rank	28	20	22	24	25	25
Annual Gallons of Wasted Fuel (000)	3,041	7,392	6,996	6,614	6,494	6,399
Rank	27	17	21	24	24	24
Annual Congestion Cost (\$ million)	95	212	213	190	169	146
Rank	28	22	213	24	25	25
Annual Greenhouse Gases (CO2) Produced	20	22	22	2-7	23	
	110 140	254 404		ı	I	
Excess Due to Congestion (tons) Rank	110,140	254,404 29				
	35					
Due to All Travel (tons)	3,071,104	7,093,700				
Rank	31	28				
Truck Annual Greenhouse Gases (CO2) Produced				1	1	
Excess Due to Truck Congestion (tons)	33,756	82,059				
		1.7	i I			
Rank	27	17				
	1,069,133 23	2,599,012 15				

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

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	1,200	1,180	1,165	1,145	1,130	1,100
Rank	39	39	39	39	39	39
Commuters (1000s)	616	618	610	598	589	571
Daily Vehicle-Miles of Travel (1000s)						
Freeway	16,144	15,817	15,260	14,974	14,765	14,430
Arterial Streets	11,599	11,584	11,450	11,405	11,246	11,300
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)	3.05	3.29	3.32	3.21	2.58	2.15
Diesel (\$/gallon)	3.49	3.78	3.75	3.57	2.84	2.45
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)	20,706	20,347	20,253	19,111	18,213	17,389
Rank	33	33	33	33	33	33
Fuel per Peak Auto Commuter (gallons)	24	23	23	22	21	18
Rank	17	17	18	18	24	34
Annual Delay						
Total Delay (1000s of person-hours)	48,192	46,524	45,483	42,139	39,786	37,277
Rank	32	33	33	33	34	34
Delay per Auto Commuter (pers-hrs)	55	53	51	49	46	44
Rank	20	22	22	22	26	28
Travel Time Index	1.22	1.21	1.22	1.21	1.20	1.20
Rank	33	35	32	33	36	36
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	1,025	972	932	855	771	705
Rank	33	33	33	33	34	34
Cost per Auto Commuter (\$)	1,177	1,150	1,137	1,088	1,058	1,011
Rank	20	21	20	22	23	25
Truck Congestion	2.52.	2 2 2 4	1 010	1.550	1 (51	1.500
Annual Person-Hours of Delay (000)	2,524	2,254	1,910	1,770	1,671	1,566
Rank	6 203	29 6 193	6 155	5 909	36 5 535	36 5 284
Annual Gallons of Wasted Fuel (000) Rank	6,293	6,183 24	6,155 24	5,808 24	5,535 24	5,284 24
Rank Annual Congestion Cost (\$ million)	128	24 111	24 94	95	24 82	24 74
Rank	26	28	30	31	32	33
Annual Greenhouse Gases (CO2) Produced	20	20	50	31	32	33
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)				I	I	
Rank (tons)						
Nank Due to Truck Travel (tons)						 -
Rank						 -
Ruin						

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

Inventory Measures	2008	2007	2006	2005	2004	2003
Urban Area Information						
Population (1000s)	1,050	1,025	1,005	980	960	940
Rank	39	42	42	43	43	42
Commuters (1000s)	543	526	512	496	483	471
Daily Vehicle-Miles of Travel (1000s)					Ì	
Freeway	14,665	14,150	13,575	13,300	13,100	13,085
Arterial Streets	11,430	11,900	11,915	11,750	11,700	11,445
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)	3.32	2.98	2.54	2.24	1.86	1.46
Diesel (\$/gallon)	4.03	3.26	2.72	2.39	1.87	1.44
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)	18,460	18,303	18,157	17,810	17,154	15,905
Rank	33	32	31	31	32	34
Fuel per Peak Auto Commuter (gallons)	20	20	20	20	19	18
Rank	31	28	28	25	27	30
Annual Delay						
Total Delay (1000s of person-hours)	37,688	37,367	37,070	36,361	35,022	32,472
Rank	34	32	32	33	33	34
Delay per Auto Commuter (pers-hrs)	46	47	48	48	48	45
Rank	25	24	20	21	18	24
Travel Time Index	1.21	1.22	1.22	1.22	1.22	1.21
Rank	36	34	34	32	32	32
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	741	700	668	630	581	518
Rank	33	32	32	33	32	34
Cost per Auto Commuter (\$)	1,012	1,043	1,061	1,077	1,073	1,022
Rank	21	21	20	20	21	24
Truck Congestion						
Annual Person-Hours of Delay (000)	1,583	1,569	1,557	1,527	1,471	1,364
Rank	36	35	35	34	35	36
Annual Gallons of Wasted Fuel (000)	5,609	5,562	5,517	5,413	5,214	4,834
Rank	24	24	23	23	24	24
Annual Congestion Cost (\$ million)	84	76	70	65	58	50
Rank	31	32	32	30	31	33
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					-	
Truck Annual Greenhouse Gases (CO2) Produced Excess Due to Truck Congestion (tons)						
Excess Due to Truck Congestion (tons) Rank	 	 		 		
Excess Due to Truck Congestion (tons)		 		 	 	

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

Inventory Measures	2002	2001	2000	1999	1998	1997
Urban Area Information						
Population (1000s)	900	850	815	780	740	700
Rank	45	47	47	49	49	51
Commuters (1000s)	444	412	389	366	342	318
Daily Vehicle-Miles of Travel (1000s)						
Freeway	12,200	11,600	11,000	10,250	9,750	9,350
Arterial Streets	10,140	9,325	8,505	8,265	8,135	8,030
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)	1.32	1.45	1.47	1.07	1.03	1.13
Diesel (\$/gallon)	1.30	1.47	1.42	1.06	1.11	1.20
System Performance	2002	2001	2000	1999	1998	1997
Congested Travel (% of peak VMT)						
Congested System (% of lane-miles)						
Congested Time (number of "Rush Hours")						
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	14,927	13,595	12,489	11,339	10,309	9,120
Rank	35	35	36	37	39	39
Fuel per Peak Auto Commuter (gallons)	18	16	14	13	12	11
Rank	27	36	50	51	53	54
Annual Delay						
Total Delay (1000s of person-hours)	30,475	27,756	25,497	23,151	21,046	18,619
Rank	34	36	37	38	39	40
Delay per Auto Commuter (pers-hrs)	45	44	43	41	40	37
Rank	21	20	19	21	19	22
Travel Time Index	1.21	1.20	1.19	1.19	1.18	1.17
Rank	31	32	34	30	30	32
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	473	426	380	330	294	257
Rank	34	37	36	38	38	40
Cost per Auto Commuter (\$)	979	905	853	802	746	670
Rank	23	29	31	33	37	45
Truck Congestion						
Annual Person-Hours of Delay (000)	1,280	1,166	1,071	972	884	782
Rank	36	39	39	2 446	40	41
Annual Gallons of Wasted Fuel (000)	4,537	4,131	3,796	3,446	3,132	2,771
Rank	25	25	26	27	27	27
Annual Congestion Cost (\$ million) Rank	45 32	40 35	36 36	30 37	27 38	24 39
	32	33	30	3/	30	39
Annual Greenhouse Gases (CO2) Produced				ı	I	
Excess Due to Congestion (tons) Rank						
Nank Due to All Travel (tons)	 					
Rank	 			<u></u>		 -
Truck Annual Greenhouse Gases (CO2) Produced				ı	I	
Excess Due to Truck Congestion (tons) Rank						
Rank Due to Truck Travel (tons)	 					
Rank	 	 				
IVAIIK						

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

Inventory Measures	1996	1995	1994	1993	1992	1991
Urban Area Information						
Population (1000s)	665	640	615	605	590	575
Rank	52	54	55	55	55	54
Commuters (1000s)	298	282	267	258	248	237
Daily Vehicle-Miles of Travel (1000s)						
Freeway	8,880	8,640	8,450	7,810	7,265	6,600
Arterial Streets	7,835	7,720	7,410	6,875	6,705	6,655
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)	1.24	1.11	1.03	1.07	1.08	1.11
Diesel (\$/gallon)	1.33	1.21	1.10	1.14	1.18	1.20
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)	8,178	7,315	6,389	5,966	5,573	5,186
Rank	40	41	42	42	42	41
Fuel per Peak Auto Commuter (gallons)	10	9	7	6	6	7
Rank	57	59	73	76	69	57
Annual Delay						
Total Delay (1000s of person-hours)	16,696	14,935	13,043	12,180	11,377	10,589
Rank	42	42	43	43	43	42
Delay per Auto Commuter (pers-hrs)	36	34	31	30	29	28
Rank	20	24	31	30	28	26
Travel Time Index	1.16	1.15	1.14	1.14	1.13	1.13
Rank	34	36	39	36	38	34
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	227	196	167	152	139	126
Rank	43	42	43	43	43	42
Cost per Auto Commuter (\$)	614	566	509	489	472	453
Rank	48	53	58	59	56	56
Truck Congestion						
Annual Person-Hours of Delay (000)	701	627	548	512	478	445
Rank	43	44	44	44	45	42
Annual Gallons of Wasted Fuel (000)	2,486	2,223	1,941	1,813	1,693	1,577
Rank	27	28	32	31	31	30
Annual Congestion Cost (\$ million)	22	19	16	15	14	13
Rank	39	41	42	42	41	40
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 Travel (Travel (tons)						
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)	565	550	540	540	535	530
Rank	54	55	55	55	54	54
Commuters (1000s)	230	222	216	214	210	207
Daily Vehicle-Miles of Travel (1000s)						
Freeway	6,265	6,065	5,545	4,975	4,440	4,115
Arterial Streets	6,620	6,600	6,605	6,070	5,955	5,470
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)	1.08	1.12	1.03	1.04	1.01	1.32
Diesel (\$/gallon)	1.07	1.02	0.94	0.94	0.92	1.20
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)	4,785	4,446	4,236	4,027	3,754	3,599
Rank	40	39	39	39	39	39
Fuel per Peak Auto Commuter (gallons)	5	5	5	4	4	4
Rank	72	63	58	61	54	50
Annual Delay						
Total Delay (1000s of person-hours)	9,768	9,077	8,649	8,221	7,664	7,348
Rank	41	40	40	39	39	39
Delay per Auto Commuter (pers-hrs)	26	25	25	24	22	22
Rank	27	26	24	20	24	20
Travel Time Index	1.12	1.12	1.11	1.11	1.10	1.10
Rank	35	33	33	30	33	27
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	112	99	90	83	75	71
Rank	40	40	40	39	39	39
Cost per Auto Commuter (\$)	437	430	431	424	410	403
Rank	55	54	50	46	41	36
Truck Congestion						
Annual Person-Hours of Delay (000)	410	381	363	345	322	309
Rank	42	42	42	41	40	37
Annual Gallons of Wasted Fuel (000)	1,454	1,352	1,287	1,224	1,141	1,094
Rank	30	32	29	28	28	25
Annual Congestion Cost (\$ million)	11	10	10	9	8	8
Rank	41	41	39	37	38	36
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank Due to All Travel (tons)						
Due to All Travel (tons) Rank	 					
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)						
Rank Due to Travel (Travel (tons)						
Due to Truck Travel (tons)						
Rank						

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

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	530	525	525
Rank	53	52	52
Commuters (1000s)	206	202	200
Daily Vehicle-Miles of Travel (1000s)			
Freeway	3,965	3,700	3,655
Arterial Streets	5,305	5,250	5,175
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.34	1.37	1.43
Diesel (\$/gallon)	1.22	1.24	1.30
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)	3,389	3,196	3,061
Rank	38	37	34
Fuel per Peak Auto Commuter (gallons)	4	3	3
Rank	41	46	34
Annual Delay			
Total Delay (1000s of person-hours)	6,920	6,526	6,250
Rank	39	37	34
Delay per Auto Commuter (pers-hrs)	21	20	19
Rank	19	18	17
Travel Time Index	1.09	1.09	1.09
Rank	30	28	26
Commuter Stress Index			
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	65	59	56
Rank	39	37	33
Cost per Auto Commuter (\$)	391	385	386
Rank	34	32	32
Truck Congestion			
Annual Person-Hours of Delay (000)	291	274	262
Rank	36	34	33
Annual Gallons of Wasted Fuel (000)	1,031	972	930
Rank	25	24	24
Annual Congestion Cost (\$ million)	8	7	7
Rank	32	32	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)			
Excess Due to Truck Congestion (tons) Rank			

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