

# 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 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 Nashville-Davidson TN

Inventory Measures	2017	2016	2015	2014	2013	2012
<b>Urban Area Information</b>						
Population (1000s)	1,215	1,210	1,205	1,200	1,180	1,165
Rank	39	39	39	39	39	39
Commuters (1000s)	626	623	620	616	618	610
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	21,128	19,948	18,785	16,144	15,817	15,260
Arterial Streets	14,619	13,972	14,669	11,599	11,584	11,450
<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)	2.14	2.00	2.06	3.05	3.29	3.32
Diesel (\$/gallon)	2.35	2.13	2.37	3.49	3.78	3.75
System Performance	2017	2016	2015	2014	2013	2012
<b>Congested Travel (% of peak VMT)</b>	24.8	--	--	--	--	--
<b>Congested System (% of lane-miles)</b>	16.6	--	--	--	--	--
<b>Congested Time (number of "Rush Hours")</b>	3.5	--	--	--	--	--
<b>Annual Excess Fuel Consumed</b>						
Total Fuel (1000 gallons)	21,765	21,367	21,056	20,706	20,347	20,253
Rank	34	34	34	34	34	34
Fuel per Peak Auto Commuter (gallons)	26	25	25	24	23	23
Rank	15	16	15	17	17	18
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	52,249	51,038	49,865	48,192	46,524	45,483
Rank	33	33	33	33	34	34
Delay per Auto Commuter (pers-hrs)	58	57	57	55	53	51
Rank	24	22	22	20	22	22
<b>Travel Time Index</b>						
Rank	1.22	1.22	1.22	1.22	1.21	1.22
Rank	33	33	34	33	35	32
<b>Commuter Stress Index</b>						
Rank	1.30	--	--	--	--	--
Rank	23	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	1.70	--	--	--	--	--
Rank	31	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	1,055	1,013	976	960	915	882
Rank	33	33	33	34	34	34
Cost per Auto Commuter (\$)	1,217	1,196	1,162	1,116	1,090	1,078
Rank	20	20	19	20	21	20
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	2,194	2,144	2,094	2,024	1,954	1,910
Rank	33	33	33	33	34	34
Annual Gallons of Wasted Fuel (000)	4,614	4,530	4,464	4,390	4,313	4,294
Rank	34	34	34	34	34	34
Annual Congestion Cost (\$ million)	111	104	97	95	87	83
Rank	34	34	34	34	34	34

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

# Mobility Data for Nashville-Davidson TN

Inventory Measures	2011	2010	2009	2008	2007	2006
<b>Urban Area Information</b>						
Population (1000s)	1,145	1,130	1,100	1,050	1,025	1,005
Rank	39	39	39	39	42	42
Commuters (1000s)	598	589	571	543	526	512
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	14,974	14,765	14,430	14,665	14,150	13,575
Arterial Streets	11,405	11,246	11,300	11,430	11,900	11,915
<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)	3.21	2.58	2.15	3.32	2.98	2.54
Diesel (\$/gallon)	3.57	2.84	2.45	4.03	3.26	2.72
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)	19,111	18,213	17,389	18,460	18,303	18,157
Rank	35	35	36	34	33	33
Fuel per Peak Auto Commuter (gallons)	22	21	18	20	20	20
Rank	18	24	34	31	28	28
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	42,139	39,786	37,277	37,688	37,367	37,070
Rank	34	35	35	35	33	33
Delay per Auto Commuter (pers-hrs)	49	46	44	46	47	48
Rank	22	26	28	25	24	20
<b>Travel Time Index</b>						
Rank	1.21	1.20	1.20	1.21	1.22	1.22
Rank	33	36	36	36	34	34
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	810	731	668	701	664	633
Rank	34	35	35	34	33	33
Cost per Auto Commuter (\$)	1,031	1,003	958	959	989	1,006
Rank	22	23	25	21	21	20
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	1,770	1,671	1,566	1,583	1,569	1,557
Rank	34	35	35	35	33	33
Annual Gallons of Wasted Fuel (000)	4,052	3,861	3,686	3,913	3,880	3,849
Rank	35	35	36	34	33	33
Annual Congestion Cost (\$ million)	84	73	66	72	67	62
Rank	34	35	35	34	33	33

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

# Mobility Data for Nashville-Davidson TN

Inventory Measures	2005	2004	2003	2002	2001	2000
<b>Urban Area Information</b>						
Population (1000s)	980	960	940	900	850	815
Rank	43	43	42	45	47	47
Commuters (1000s)	496	483	471	444	412	389
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	13,300	13,100	13,085	12,200	11,600	11,000
Arterial Streets	11,750	11,700	11,445	10,140	9,325	8,505
<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)	2.24	1.86	1.46	1.32	1.45	1.47
Diesel (\$/gallon)	2.39	1.87	1.44	1.30	1.47	1.42
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)	17,810	17,154	15,905	14,927	13,595	12,489
Rank	33	34	35	36	36	36
Fuel per Peak Auto Commuter (gallons)	20	19	18	18	16	14
Rank	25	27	30	27	36	50
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	36,361	35,022	32,472	30,475	27,756	25,497
Rank	34	34	35	35	38	38
Delay per Auto Commuter (pers-hrs)	48	48	45	45	44	43
Rank	21	18	24	21	20	19
<b>Travel Time Index</b>						
Rank	1.22	1.22	1.21	1.21	1.20	1.19
Rank	32	32	32	31	32	34
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	597	550	491	448	404	361
Rank	34	33	35	36	38	37
Cost per Auto Commuter (\$)	1,021	1,017	969	928	858	809
Rank	20	21	24	23	29	31
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	1,527	1,471	1,364	1,280	1,166	1,071
Rank	34	34	35	35	38	37
Annual Gallons of Wasted Fuel (000)	3,776	3,637	3,372	3,165	2,882	2,648
Rank	33	34	35	36	36	36
Annual Congestion Cost (\$ million)	58	52	45	41	36	32
Rank	32	33	35	36	38	37

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

# Mobility Data for Nashville-Davidson TN

Inventory Measures	1999	1998	1997	1996	1995	1994
<b>Urban Area Information</b>						
Population (1000s)	780	740	700	665	640	615
Rank	49	49	51	52	54	55
Commuters (1000s)	366	342	318	298	282	267
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	10,250	9,750	9,350	8,880	8,640	8,450
Arterial Streets	8,265	8,135	8,030	7,835	7,720	7,410
<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)	1.07	1.03	1.13	1.24	1.11	1.03
Diesel (\$/gallon)	1.06	1.11	1.20	1.33	1.21	1.10
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)	11,339	10,309	9,120	8,178	7,315	6,389
Rank	37	38	38	40	40	42
Fuel per Peak Auto Commuter (gallons)	13	12	11	10	9	7
Rank	51	53	54	57	59	73
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	23,151	21,046	18,619	16,696	14,935	13,043
Rank	38	38	39	42	42	43
Delay per Auto Commuter (pers-hrs)	41	40	37	36	34	31
Rank	21	19	22	20	24	31
<b>Travel Time Index</b>						
Rank	1.19	1.18	1.17	1.16	1.15	1.14
Rank	30	30	32	35	35	38
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	313	279	244	215	186	158
Rank	38	38	39	43	42	43
Cost per Auto Commuter (\$)	760	707	635	582	537	483
Rank	33	37	45	48	53	58
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	972	884	782	701	627	548
Rank	38	38	39	42	42	43
Annual Gallons of Wasted Fuel (000)	2,404	2,185	1,933	1,734	1,551	1,354
Rank	37	38	38	40	40	42
Annual Congestion Cost (\$ million)	28	25	22	20	17	15
Rank	37	37	38	38	41	42

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

# Mobility Data for Nashville-Davidson TN

Inventory Measures	1993	1992	1991	1990	1989	1988
<b>Urban Area Information</b>						
Population (1000s)	605	590	575	565	550	540
Rank	55	55	54	54	55	55
Commuters (1000s)	258	248	237	230	222	216
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	7,810	7,265	6,600	6,265	6,065	5,545
Arterial Streets	6,875	6,705	6,655	6,620	6,600	6,605
<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)	1.07	1.08	1.11	1.08	1.12	1.03
Diesel (\$/gallon)	1.14	1.18	1.20	1.07	1.02	0.94
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)	5,966	5,573	5,186	4,785	4,446	4,236
Rank	43	43	42	41	40	40
Fuel per Peak Auto Commuter (gallons)	6	6	7	5	5	5
Rank	76	69	57	72	63	58
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	12,180	11,377	10,589	9,768	9,077	8,649
Rank	43	43	41	42	42	40
Delay per Auto Commuter (pers-hrs)	30	29	28	26	25	25
Rank	30	28	26	27	26	24
<b>Travel Time Index</b>						
Rank	1.14	1.13	1.13	1.12	1.12	1.11
Rank	35	37	33	34	32	32
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	144	131	119	106	94	85
Rank	43	43	41	42	42	40
Cost per Auto Commuter (\$)	464	447	429	414	408	409
Rank	59	56	56	55	54	50
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	512	478	445	410	381	363
Rank	43	43	41	42	42	40
Annual Gallons of Wasted Fuel (000)	1,265	1,181	1,100	1,014	943	898
Rank	43	43	42	41	40	40
Annual Congestion Cost (\$ million)	14	13	12	10	10	9
Rank	41	40	41	42	39	39

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

# Mobility Data for Nashville-Davidson TN

Inventory Measures	1987	1986	1985	1984	1983	1982
<b>Urban Area Information</b>						
Population (1000s)	540	535	530	530	525	525
Rank	55	54	54	53	52	52
Commuters (1000s)	214	210	207	206	202	200
<b>Daily Vehicle-Miles of Travel (1000s)</b>						
Freeway	4,975	4,440	4,115	3,965	3,700	3,655
Arterial Streets	6,070	5,955	5,470	5,305	5,250	5,175
<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)	1.04	1.01	1.32	1.34	1.37	1.43
Diesel (\$/gallon)	0.94	0.92	1.20	1.22	1.24	1.30
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)	4,027	3,754	3,599	3,389	3,196	3,061
Rank	39	39	40	37	37	36
Fuel per Peak Auto Commuter (gallons)	4	4	4	4	3	3
Rank	61	54	50	41	46	34
<b>Annual Delay</b>						
Total Delay (1000s of person-hours)	8,221	7,664	7,348	6,920	6,526	6,250
Rank	39	39	39	39	37	36
Delay per Auto Commuter (pers-hrs)	24	22	22	21	20	19
Rank	20	24	20	19	18	17
<b>Travel Time Index</b>						
Rank	29	32	26	29	27	25
<b>Commuter Stress Index</b>						
Rank	--	--	--	--	--	--
<b>Freeway Planning Time Index (95th Pctile)</b>						
Rank	--	--	--	--	--	--
<b>Congestion Cost</b>						
Total Cost (\$ millions)	78	71	68	62	56	53
Rank	39	39	39	38	37	35
Cost per Auto Commuter (\$)	402	389	382	371	365	366
Rank	46	41	36	34	32	32
<b>Truck Congestion</b>						
Annual Person-Hours of Delay (000)	345	322	309	291	274	262
Rank	39	39	39	39	37	36
Annual Gallons of Wasted Fuel (000)	854	796	763	719	678	649
Rank	39	39	40	37	37	36
Annual Congestion Cost (\$ million)	8	8	7	7	7	6
Rank	39	39	39	37	34	35

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