

Performance Measure Summary - Raleigh NC

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 Raleigh NC

Inventory Measures	2017	2016	2015	2014	2013	2012
Urban Area Information						
Population (1000s)	1,030	1,005	980	965	950	935
Rank	45	46	47	48	49	49
Commuters (1000s)	521	508	495	487	489	482
Daily Vehicle-Miles of Travel (1000s)						
Freeway	10,593	10,229	9,908	9,464	8,486	8,150
Arterial Streets	12,468	12,630	12,182	11,489	9,852	9,530
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)	2.20	2.10	2.15	3.20	3.44	3.49
Diesel (\$/gallon)	2.45	2.23	2.47	3.58	3.89	3.89
System Performance	2017	2016	2015	2014	2013	2012
Congested Travel (% of peak VMT)	19.2	--	--	--	--	--
Congested System (% of lane-miles)	11.5	--	--	--	--	--
Congested Time (number of "Rush Hours")	2.7	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	9,067	8,992	8,844	8,684	8,479	8,078
Rank	57	57	57	57	57	59
Fuel per Peak Auto Commuter (gallons)	16	15	14	13	14	13
Rank	77	83	87	88	85	87
Annual Delay						
Total Delay (1000s of person-hours)	27,243	26,577	25,692	24,789	23,775	22,446
Rank	53	53	53	53	53	53
Delay per Auto Commuter (pers-hrs)	42	41	39	37	37	35
Rank	67	68	71	77	71	78
Travel Time Index						
Rank	1.17	1.17	1.17	1.17	1.16	1.16
Rank	49	49	49	52	58	60
Commuter Stress Index						
Rank	1.17	--	--	--	--	--
Rank	66	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	1.58	--	--	--	--	--
Rank	41	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	546	524	499	489	462	430
Rank	53	53	53	53	53	53
Cost per Auto Commuter (\$)	794	780	751	720	698	668
Rank	57	57	59	59	62	64
Truck Congestion						
Annual Person-Hours of Delay (000)	1,144	1,116	1,079	1,041	999	943
Rank	53	53	53	53	53	53
Annual Gallons of Wasted Fuel (000)	1,922	1,906	1,875	1,841	1,798	1,712
Rank	57	57	57	57	57	59
Annual Congestion Cost (\$ million)	57	53	49	48	43	39
Rank	53	53	53	53	53	53

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

Mobility Data for Raleigh NC

Inventory Measures	2011	2010	2009	2008	2007	2006
Urban Area Information						
Population (1000s)	920	910	900	880	860	860
Rank	50	50	49	50	51	50
Commuters (1000s)	473	466	459	448	434	431
Daily Vehicle-Miles of Travel (1000s)						
Freeway	8,080	7,550	7,450	7,360	6,800	6,300
Arterial Streets	9,440	9,100	9,000	8,900	8,800	8,400
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)	3.32	2.70	2.24	3.42	2.95	2.62
Diesel (\$/gallon)	3.64	2.93	2.53	4.11	3.33	2.80
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)	8,045	7,998	7,547	7,682	7,504	7,372
Rank	59	58	60	60	58	59
Fuel per Peak Auto Commuter (gallons)	13	14	12	12	12	12
Rank	84	80	83	90	90	86
Annual Delay						
Total Delay (1000s of person-hours)	21,948	21,618	20,017	19,404	18,956	18,621
Rank	53	53	53	53	53	52
Delay per Auto Commuter (pers-hrs)	35	34	34	33	33	32
Rank	74	76	74	73	73	77
Travel Time Index						
Rank	59	58	58	63	63	62
Commuter Stress Index						
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	416	393	355	355	331	314
Rank	53	53	53	54	54	53
Cost per Auto Commuter (\$)	674	684	645	620	627	635
Rank	64	64	66	70	73	70
Truck Congestion						
Annual Person-Hours of Delay (000)	922	908	841	815	796	782
Rank	53	53	53	53	53	52
Annual Gallons of Wasted Fuel (000)	1,706	1,696	1,600	1,628	1,591	1,563
Rank	59	58	60	60	58	59
Annual Congestion Cost (\$ million)	42	39	35	36	33	30
Rank	53	53	53	55	55	54

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

Mobility Data for Raleigh NC

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	840	820	810	790	770	750
Rank	51	51	51	51	51	51
Commuters (1000s)	418	406	399	383	367	352
Daily Vehicle-Miles of Travel (1000s)						
Freeway	5,900	5,630	5,265	5,125	4,925	4,500
Arterial Streets	8,000	7,200	6,900	6,500	6,200	5,700
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)	2.27	1.89	1.46	1.33	1.43	1.46
Diesel (\$/gallon)	2.44	1.90	1.47	1.32	1.47	1.44
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)	7,134	6,922	6,713	6,379	5,936	5,453
Rank	60	59	59	59	61	64
Fuel per Peak Auto Commuter (gallons)	11	11	12	11	10	10
Rank	88	88	83	84	85	80
Annual Delay						
Total Delay (1000s of person-hours)	18,022	17,485	16,958	16,115	14,995	13,776
Rank	53	53	53	53	53	56
Delay per Auto Commuter (pers-hrs)	32	32	31	31	30	28
Rank	75	73	75	72	71	76
Travel Time Index						
Rank	1.16	1.16	1.16	1.16	1.15	1.14
Rank	61	59	56	54	58	65
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	292	272	254	235	216	193
Rank	53	53	53	53	53	56
Cost per Auto Commuter (\$)	635	637	634	615	581	547
Rank	68	67	68	69	70	76
Truck Congestion						
Annual Person-Hours of Delay (000)	757	734	712	677	630	579
Rank	53	53	53	53	53	56
Annual Gallons of Wasted Fuel (000)	1,512	1,467	1,423	1,352	1,258	1,156
Rank	60	59	59	59	61	64
Annual Congestion Cost (\$ million)	28	25	23	21	19	17
Rank	53	53	53	53	54	56

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

Mobility Data for Raleigh NC

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	710	690	650	630	610	590
Rank	51	53	54	56	58	58
Commuters (1000s)	328	314	291	277	264	252
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,065	4,025	3,810	3,650	3,610	3,330
Arterial Streets	5,600	5,400	5,320	5,290	5,265	4,630
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)	1.05	1.02	1.14	1.21	1.13	1.02
Diesel (\$/gallon)	1.06	1.12	1.20	1.28	1.19	1.08
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)	4,811	4,378	4,015	3,683	3,438	3,125
Rank	67	69	69	71	70	71
Fuel per Peak Auto Commuter (gallons)	9	8	7	6	6	6
Rank	85	83	86	85	85	84
Annual Delay						
Total Delay (1000s of person-hours)	12,153	11,060	10,142	9,304	8,684	7,895
Rank	58	58	61	62	63	63
Delay per Auto Commuter (pers-hrs)	27	26	26	24	24	23
Rank	74	72	69	73	70	69
Travel Time Index						
Rank	70	66	62	67	59	63
Commuter Stress Index						
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	163	145	132	119	107	95
Rank	58	58	61	62	63	63
Cost per Auto Commuter (\$)	500	464	434	407	391	366
Rank	78	79	79	78	78	78
Truck Congestion						
Annual Person-Hours of Delay (000)	510	465	426	391	365	332
Rank	58	58	61	62	63	63
Annual Gallons of Wasted Fuel (000)	1,020	928	851	781	729	663
Rank	67	69	69	71	70	71
Annual Congestion Cost (\$ million)	14	13	12	11	10	9
Rank	58	58	60	61	61	60

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

Mobility Data for Raleigh NC

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	565	550	520	500	490	465
Rank	60	60	61	63	63	65
Commuters (1000s)	237	227	211	200	194	183
Daily Vehicle-Miles of Travel (1000s)						
Freeway	3,100	2,800	2,430	2,100	1,930	1,825
Arterial Streets	4,475	4,260	4,140	4,100	3,800	3,600
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)	1.07	1.08	1.12	1.08	1.08	1.00
Diesel (\$/gallon)	1.13	1.15	1.21	1.07	0.98	0.91
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)	2,796	2,542	2,382	2,245	1,925	1,551
Rank	72	71	71	70	70	73
Fuel per Peak Auto Commuter (gallons)	4	4	4	5	4	2
Rank	89	87	85	72	76	87
Annual Delay						
Total Delay (1000s of person-hours)	7,063	6,421	6,018	5,670	4,862	3,919
Rank	64	63	62	61	64	68
Delay per Auto Commuter (pers-hrs)	21	20	20	20	18	15
Rank	71	67	65	59	59	67
Travel Time Index						
Rank	1.10	1.10	1.10	1.10	1.09	1.07
Rank	67	59	51	46	48	60
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	83	73	67	61	50	38
Rank	64	63	62	61	63	68
Cost per Auto Commuter (\$)	336	317	306	303	273	229
Rank	78	80	79	77	78	84
Truck Congestion						
Annual Person-Hours of Delay (000)	297	270	253	238	204	165
Rank	64	63	62	61	64	67
Annual Gallons of Wasted Fuel (000)	593	539	505	476	408	329
Rank	72	71	71	70	70	72
Annual Congestion Cost (\$ million)	8	7	6	6	5	4
Rank	61	63	64	59	60	64

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

Mobility Data for Raleigh NC

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	455	430	410	390	380	365
Rank	65	66	66	66	66	67
Commuters (1000s)	178	166	158	149	144	137
Daily Vehicle-Miles of Travel (1000s)						
Freeway	1,710	1,500	1,380	1,270	1,120	1,000
Arterial Streets	3,450	3,320	3,200	3,160	3,120	3,000
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)	1.00	0.98	1.28	1.29	1.32	1.38
Diesel (\$/gallon)	0.91	0.89	1.16	1.17	1.20	1.26
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)	1,403	1,139	1,003	774	625	516
Rank	73	76	77	79	81	82
Fuel per Peak Auto Commuter (gallons)	2	2	3	1	1	1
Rank	86	84	66	87	86	82
Annual Delay						
Total Delay (1000s of person-hours)	3,543	2,877	2,534	1,955	1,579	1,304
Rank	67	70	72	73	76	77
Delay per Auto Commuter (pers-hrs)	14	12	11	9	8	7
Rank	64	74	72	78	76	82
Travel Time Index						
Rank	1.07	1.06	1.06	1.04	1.04	1.03
Rank	55	57	54	75	68	76
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	33	26	23	17	13	11
Rank	67	71	71	74	76	77
Cost per Auto Commuter (\$)	219	180	162	137	112	92
Rank	85	86	87	91	95	94
Truck Congestion						
Annual Person-Hours of Delay (000)	149	121	106	82	66	55
Rank	67	70	72	73	76	77
Annual Gallons of Wasted Fuel (000)	297	241	213	164	133	109
Rank	73	76	77	79	81	82
Annual Congestion Cost (\$ million)	4	3	3	2	2	1
Rank	63	67	65	70	66	75

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