

Performance Measure Summary - Phoenix-Mesa AZ

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 Phoenix-Mesa AZ

Inventory Measures	2017	2016	2015	2014	2013	2012
Urban Area Information						
Population (1000s)	4,000	3,980	3,945	3,925	3,900	3,850
Rank	11	11	11	11	11	11
Commuters (1000s)	2,039	2,028	2,009	1,998	1,985	1,942
Daily Vehicle-Miles of Travel (1000s)						
Freeway	32,587	31,625	31,209	30,803	29,401	30,025
Arterial Streets	40,584	41,697	41,579	38,100	38,160	34,460
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)	2.23	2.15	2.42	3.23	3.47	3.34
Diesel (\$/gallon)	2.42	2.20	2.41	3.55	3.77	3.94
System Performance	2017	2016	2015	2014	2013	2012
Congested Travel (% of peak VMT)	27.9	--	--	--	--	--
Congested System (% of lane-miles)	14.8	--	--	--	--	--
Congested Time (number of "Rush Hours")	4.1	--	--	--	--	--
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	67,117	66,749	66,367	65,942	65,311	64,527
Rank	12	12	12	12	12	12
Fuel per Peak Auto Commuter (gallons)	26	25	24	23	23	24
Rank	15	16	20	19	17	16
Annual Delay						
Total Delay (1000s of person-hours)	163,247	160,159	156,520	152,812	150,010	145,564
Rank	14	14	14	14	14	14
Delay per Auto Commuter (pers-hrs)	62	61	59	57	55	53
Rank	18	18	19	19	19	19
Travel Time Index						
Rank	1.27	1.27	1.27	1.27	1.27	1.28
Rank	22	21	20	20	20	20
Commuter Stress Index						
Rank	1.30	--	--	--	--	--
Rank	23	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	1.97	--	--	--	--	--
Rank	17	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	3,300	3,188	3,083	3,057	2,958	2,827
Rank	14	14	14	14	14	14
Cost per Auto Commuter (\$)	1,089	1,075	1,045	1,013	1,005	988
Rank	30	30	27	26	25	25
Truck Congestion						
Annual Person-Hours of Delay (000)	6,856	6,727	6,574	6,418	6,300	6,114
Rank	14	14	14	14	14	14
Annual Gallons of Wasted Fuel (000)	14,229	14,151	14,070	13,980	13,846	13,680
Rank	12	12	12	12	12	12
Annual Congestion Cost (\$ million)	348	327	304	302	280	267
Rank	14	14	14	14	14	14

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

Mobility Data for Phoenix-Mesa AZ

Inventory Measures	2011	2010	2009	2008	2007	2006
Urban Area Information						
Population (1000s)	3,790	3,740	3,625	3,540	3,490	3,390
Rank	12	12	12	12	12	12
Commuters (1000s)	1,902	1,870	1,803	1,742	1,708	1,650
Daily Vehicle-Miles of Travel (1000s)						
Freeway	29,657	29,278	29,300	29,200	29,450	29,400
Arterial Streets	35,248	34,798	34,800	34,925	35,000	34,500
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)	3.19	2.70	2.32	3.36	3.03	2.63
Diesel (\$/gallon)	3.68	2.99	2.59	4.09	3.55	2.97
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)	62,456	60,836	59,674	64,344	65,212	60,692
Rank	13	13	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	24	23	20	24	26	24
Rank	14	14	18	9	6	10
Annual Delay						
Total Delay (1000s of person-hours)	138,331	133,493	128,498	131,955	133,736	124,466
Rank	14	14	14	13	13	13
Delay per Auto Commuter (pers-hrs)	52	50	49	47	48	48
Rank	18	17	15	21	19	20
Travel Time Index						
Rank	1.28	1.28	1.29	1.29	1.30	1.29
Rank	19	16	12	15	13	14
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	2,658	2,459	2,311	2,456	2,380	2,133
Rank	14	14	14	13	13	13
Cost per Auto Commuter (\$)	969	964	945	961	1,012	968
Rank	25	27	27	20	18	24
Truck Congestion						
Annual Person-Hours of Delay (000)	5,810	5,607	5,397	5,542	5,617	5,228
Rank	14	14	14	13	13	13
Annual Gallons of Wasted Fuel (000)	13,241	12,897	12,651	13,641	13,825	12,867
Rank	13	13	13	13	13	13
Annual Congestion Cost (\$ million)	276	248	231	254	243	212
Rank	14	14	14	13	13	13

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

Mobility Data for Phoenix-Mesa AZ

Inventory Measures	2005	2004	2003	2002	2001	2000
Urban Area Information						
Population (1000s)	3,300	3,160	3,050	2,970	2,900	2,825
Rank	13	13	13	13	13	13
Commuters (1000s)	1,580	1,501	1,438	1,376	1,323	1,256
Daily Vehicle-Miles of Travel (1000s)						
Freeway	28,370	26,670	25,000	22,550	21,600	19,425
Arterial Streets	34,105	32,110	31,035	30,515	29,725	29,100
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)	2.42	2.04	1.59	1.47	1.62	1.52
Diesel (\$/gallon)	2.69	2.12	1.61	1.46	1.66	1.57
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)	57,691	53,336	50,131	47,705	44,702	42,181
Rank	13	13	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	24	21	20	19	18	17
Rank	10	14	17	18	23	24
Annual Delay						
Total Delay (1000s of person-hours)	118,312	109,380	102,808	97,832	91,675	86,505
Rank	14	14	14	14	15	14
Delay per Auto Commuter (pers-hrs)	47	47	46	46	46	45
Rank	22	22	20	17	15	15
Travel Time Index						
Rank	1.28	1.28	1.27	1.27	1.26	1.25
Rank	16	16	15	14	16	17
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	1,955	1,729	1,561	1,447	1,340	1,226
Rank	14	14	14	14	14	14
Cost per Auto Commuter (\$)	950	909	877	853	810	786
Rank	26	30	31	33	34	33
Truck Congestion						
Annual Person-Hours of Delay (000)	4,969	4,594	4,318	4,109	3,850	3,633
Rank	14	14	14	14	15	14
Annual Gallons of Wasted Fuel (000)	12,231	11,307	10,628	10,113	9,477	8,942
Rank	13	13	13	13	13	13
Annual Congestion Cost (\$ million)	192	166	146	133	122	111
Rank	14	14	14	14	14	14

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

Mobility Data for Phoenix-Mesa AZ

Inventory Measures	1999	1998	1997	1996	1995	1994
Urban Area Information						
Population (1000s)	2,700	2,550	2,450	2,340	2,220	2,130
Rank	13	15	15	15	15	16
Commuters (1000s)	1,169	1,086	1,026	965	900	850
Daily Vehicle-Miles of Travel (1000s)						
Freeway	16,995	15,005	13,925	13,345	12,000	10,600
Arterial Streets	28,600	28,025	27,500	27,220	26,800	26,400
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)	1.38	1.19	1.32	1.26	1.20	1.19
Diesel (\$/gallon)	1.39	1.31	1.34	1.29	1.22	1.21
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)	39,449	34,791	32,117	30,267	27,587	25,373
Rank	13	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	17	14	13	12	11	10
Rank	17	31	38	38	41	45
Annual Delay						
Total Delay (1000s of person-hours)	80,900	71,348	65,865	62,072	56,575	52,034
Rank	15	15	15	15	15	15
Delay per Auto Commuter (pers-hrs)	45	44	44	44	43	42
Rank	14	13	11	11	11	11
Travel Time Index						
Rank	1.25	1.24	1.23	1.23	1.22	1.22
Rank	15	14	15	10	13	11
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	1,105	950	868	799	707	634
Rank	14	15	15	15	15	15
Cost per Auto Commuter (\$)	760	686	643	620	582	551
Rank	33	42	41	41	44	45
Truck Congestion						
Annual Person-Hours of Delay (000)	3,398	2,997	2,766	2,607	2,376	2,185
Rank	15	15	15	15	15	15
Annual Gallons of Wasted Fuel (000)	8,363	7,376	6,809	6,417	5,848	5,379
Rank	13	14	14	14	14	14
Annual Congestion Cost (\$ million)	99	86	78	73	65	59
Rank	14	14	15	14	15	15

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

Mobility Data for Phoenix-Mesa AZ

Inventory Measures	1993	1992	1991	1990	1989	1988
Urban Area Information						
Population (1000s)	2,070	2,022	1,930	1,895	1,875	1,830
Rank	17	17	18	18	18	18
Commuters (1000s)	813	782	734	709	697	675
Daily Vehicle-Miles of Travel (1000s)						
Freeway	9,910	9,800	9,015	7,850	6,705	5,065
Arterial Streets	26,215	25,545	25,220	25,055	24,310	24,000
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)	1.18	1.22	1.06	1.07	1.11	1.02
Diesel (\$/gallon)	1.20	1.26	1.20	1.18	1.20	1.10
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)	24,469	23,203	21,599	20,829	19,991	19,199
Rank	14	14	14	14	14	14
Fuel per Peak Auto Commuter (gallons)	9	10	8	8	7	7
Rank	49	24	45	35	39	27
Annual Delay						
Total Delay (1000s of person-hours)	50,181	47,584	44,296	42,716	40,997	39,373
Rank	15	15	15	14	14	14
Delay per Auto Commuter (pers-hrs)	42	41	41	41	40	39
Rank	11	10	9	8	8	9
Travel Time Index						
Rank	1.22	1.21	1.21	1.21	1.20	1.20
Rank	7	11	8	7	8	7
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	597	553	498	463	425	390
Rank	15	15	15	14	14	14
Cost per Auto Commuter (\$)	547	534	513	516	525	530
Rank	41	41	41	31	30	25
Truck Congestion						
Annual Person-Hours of Delay (000)	2,108	1,999	1,860	1,794	1,722	1,654
Rank	15	15	15	14	14	14
Annual Gallons of Wasted Fuel (000)	5,187	4,919	4,579	4,416	4,238	4,070
Rank	14	14	14	14	14	14
Annual Congestion Cost (\$ million)	56	53	48	46	44	41
Rank	15	14	14	14	14	14

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

Mobility Data for Phoenix-Mesa AZ

Inventory Measures	1987	1986	1985	1984	1983	1982
Urban Area Information						
Population (1000s)	1,820	1,735	1,650	1,590	1,520	1,430
Rank	18	20	20	20	20	21
Commuters (1000s)	665	629	594	568	539	502
Daily Vehicle-Miles of Travel (1000s)						
Freeway	4,440	4,050	3,715	3,625	3,035	2,975
Arterial Streets	23,435	22,525	22,040	21,500	21,185	21,070
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)	1.03	1.00	1.31	1.33	1.36	1.42
Diesel (\$/gallon)	1.11	1.08	1.42	1.43	1.46	1.53
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)	18,282	17,982	16,694	15,671	14,764	13,223
Rank	14	14	13	13	13	13
Fuel per Peak Auto Commuter (gallons)	7	8	6	6	7	4
Rank	22	14	22	20	12	19
Annual Delay						
Total Delay (1000s of person-hours)	37,492	36,876	34,236	32,138	30,277	27,117
Rank	14	14	14	14	14	14
Delay per Auto Commuter (pers-hrs)	38	39	38	38	37	36
Rank	8	5	5	6	5	4
Travel Time Index						
Rank	1.20	1.20	1.20	1.19	1.19	1.18
Rank	5	5	5	6	5	5
Commuter Stress Index						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Freeway Planning Time Index (95th Pctile)						
Rank	--	--	--	--	--	--
Rank	--	--	--	--	--	--
Congestion Cost						
Total Cost (\$ millions)	358	341	316	288	262	229
Rank	14	14	14	14	14	14
Cost per Auto Commuter (\$)	526	538	508	494	487	451
Rank	24	22	22	20	19	20
Truck Congestion						
Annual Person-Hours of Delay (000)	1,575	1,549	1,438	1,350	1,272	1,139
Rank	14	14	14	14	14	14
Annual Gallons of Wasted Fuel (000)	3,876	3,812	3,539	3,322	3,130	2,803
Rank	14	14	13	13	13	13
Annual Congestion Cost (\$ million)	39	38	36	33	31	28
Rank	14	14	14	14	14	14

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