Performance Measure Summary - Virginia Beach VA

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)	1,475	1,475	1,475	1,470	1,470	1,465
Rank	36	36	36	36	36	36
Commuters (1000s)	751	751	751	748	748	745
Daily Vehicle-Miles of Travel (1000s)						
Freeway	11,085	12,950	12,891	12,882	12,717	12,395
Arterial Streets	12,632	14,757	14,737	14,932	15,082	15,935
Cost Components		,	,	· ·	,	
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	2.38	2.64	2.15	2.01	2.09
Diesel (\$/gallon)	2.67	2.88	3.05	2.39	2.16	2.43
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)				15.9		
Congested System (% of lane-miles)				9.3		
Congested Time (number of "Rush Hours")				1.9		
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	7,171	14,318	14,271	14,149	14,289	14,414
Rank	47	47	46	45	45	45
Fuel per Peak Auto Commuter (gallons)	8	15	15	15	15	15
Rank	82	91	86	84	83	83
Annual Delay						
Total Delay (1000s of person-hours)	19,220	38,378	39,035	40,510	40,180	39,492
Rank	43	44	41	40	40	40
Delay per Auto Commuter (pers-hrs)	22	43	44	46	46	44
Rank	72	69	60	47	47	49
Travel Time Index	1.06	1.16	1.16	1.17	1.17	1.17
Rank	75	59	57	47	46	46
Commuter Stress Index	1.07	1.18	1.19	1.18		
Rank	75	60	51	56		
Freeway Planning Time Index (95th Pctile)		1.39	1.44	1.46		
Rank		54	47	47		
Congestion Cost						
Total Cost (\$ millions)	423	809	831	845	825	801
Rank	43	44	43	41	40	40
Cost per Auto Commuter (\$)	399	763	783	800	800	781
Rank	80	82	75	66	63	60
Truck Congestion						
Annual Person-Hours of Delay (000)	695	1,215	1,277	1,301	1,291	1,269
Rank	54	53	50	49	49	49
Annual Gallons of Wasted Fuel (000)	1,218	2,129	2,261	2,327	2,349	2,370
Rank	53	52	50	49	49	48
Annual Congestion Cost (\$ million)	37	60	70	69	65	61
Rank	54	54	50	49	49	49
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	71,107	141,982				
Rank	48	47				
Due to All Travel (tons)	2,543,128	5,077,940				
Rank	41	39				
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	13,388	23,402				
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Rank	54	52				
		52 977,631 47	 	 		

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

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	1,460	1,455	1,455	1,450	1,450	1,450
Rank	35	35	35	33	33	33
Commuters (1000s)	742	746	754	750	748	745
Daily Vehicle-Miles of Travel (1000s)						
Freeway	12,820	13,003	13,120	13,144	13,110	12,907
Arterial Streets	14,829	15,843	16,405	18,165	18,118	17,712
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)	3.09	3.37	3.39	3.29	2.63	2.18
Diesel (\$/gallon)	3.48	3.77	3.78	3.60	2.88	2.50
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)	14,489	14,395	14,198	14,170	14,131	13,816
Rank	43	43	43	41	41	41
Fuel per Peak Auto Commuter (gallons)	16	16	16	16	16	16
Rank	70	71	69	67	68	54
Annual Delay						
Total Delay (1000s of person-hours)	39,001	38,055	36,852	36,438	36,000	34,866
Rank	40	40	39	39	36	36
Delay per Auto Commuter (pers-hrs)	43	41	39	39	38	39
Rank	49	52	61	54	57	47
Travel Time Index	1.17	1.18	1.18	1.17	1.17	1.17
Rank	49	39	38	43	41	43
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	804	774	740	723	684	646
Rank	40	40	40	39	39	36
Cost per Auto Commuter (\$)	768	756	743	756	771	759
Rank	58	58	58	54	51	51
Truck Congestion						
Annual Person-Hours of Delay (000)	1,253	1,222	1,184	1,170	1,156	1,120
Rank	48	48	47	47	47	46
Annual Gallons of Wasted Fuel (000)	2,383	2,367	2,335	2,330	2,324	2,272
Rank	47	47	47	47	47	47
Annual Congestion Cost (\$ million)	61	56	53	57	53	49
Rank	48	48	47	47	47	47
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						

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

Inventory Measures	2008	2007	2006	2005	2004	2003
Urban Area Information						
Population (1000s)	1,450	1,450	1,445	1,445	1,445	1,445
Rank	32	32	32	32	32	32
Commuters (1000s)	743	737	730	724	720	716
Daily Vehicle-Miles of Travel (1000s)						
Freeway	13,090	13,115	13,200	13,105	12,995	12,875
Arterial Streets	16,900	16,300	15,815	15,900	15,725	15,710
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)	3.35	2.88	2.57	2.24	1.85	1.46
Diesel (\$/gallon)	4.08	3.27	2.74	2.41	1.89	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)	13,971	13,908	13,742	13,436	13,194	12,896
Rank	43	41	40	41	40	40
Fuel per Peak Auto Commuter (gallons)	17	17	17	17	17	16
Rank	61	61	56	48	46	49
Annual Delay						
Total Delay (1000s of person-hours)	33,578	33,425	33,028	32,291	31,709	30,993
Rank	37	37	35	36	36	36
Delay per Auto Commuter (pers-hrs)	37	38	38	38	38	39
Rank	54	48	45	46	42	37
Travel Time Index	1.18	1.18	1.18	1.18	1.18	1.17
Rank	43	43	42	41	38	44
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	643	610	583	548	515	486
Rank	39	37	36	36	36	36
Cost per Auto Commuter (\$)	725	750	762	769	781	784
Rank	55	55	53	51	49	46
Truck Congestion						
Annual Person-Hours of Delay (000)	1,078	1,074	1,061	1,037	1,019	996
Rank	46	46	46	44	44	44
Annual Gallons of Wasted Fuel (000)	2,298	2,287	2,260	2,209	2,170	2,121
Rank	48	47	46	44	43	42
Annual Congestion Cost (\$ million)	51	47	44	41	37	35
Rank	46	47	45	44	44	44
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank	 	 		 		
- '		 		 		
Rank				 		
Rank Due to All Travel (tons)	 	 	 	 	 	
Rank Due to All Travel (tons) Rank	 	 	 	 	 	
Rank Due to All Travel (tons) Rank Truck Annual Greenhouse Gases (CO2) Produced	 	 	 	 		
Rank Due to All Travel (tons) Rank Truck Annual Greenhouse Gases (CO2) Produced 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)	1,440	1,440	1,440	1,440	1,435	1,435
Rank	32	31	29	29	28	28
Commuters (1000s)	703	692	681	669	657	646
Daily Vehicle-Miles of Travel (1000s)						
Freeway	12,460	11,635	11,400	11,200	10,755	10,680
Arterial Streets	16,000	15,780	15,250	14,900	14,250	13,845
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	1.47	1.49	1.05	1.02	1.13
Diesel (\$/gallon)	1.31	1.46	1.45	1.06	1.09	1.18
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)	12,662	12,524	12,184	11,724	11,286	10,703
Rank	40	39	37	36	35	36
Fuel per Peak Auto Commuter (gallons)	16	16	16	16	15	15
Rank	42	36	32	27	25	17
Annual Delay						
Total Delay (1000s of person-hours)	30,430	30,099	29,281	28,178	27,124	25,722
Rank	35	34	33	34	33	32
Delay per Auto Commuter (pers-hrs)	39	39	39	38	37	36
Rank	36	32	30	32	31	28
Travel Time Index	1.17	1.17	1.17	1.16	1.16	1.15
Rank	40	38	36	39	36	41
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	464	454	430	395	373	349
Rank	36	34	34	34	34	33
Cost per Auto Commuter (\$)	788	788	788	786	772	745
Rank	45	41	38	36	31	30
Truck Congestion						
Annual Person-Hours of Delay (000)	977	967	941	905	871	826
Rank	44	42	41	41	41	40
Annual Gallons of Wasted Fuel (000)	2,082	2,059	2,004	1,928	1,856	1,760
Rank	42	41	41	41	39	39
Annual Congestion Cost (\$ million)	32	31	30	27	25	24
Rank	44	42	41	41	41	39
Annual Greenhouse Gases (CO2) Produced					ı	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					ı	
Excess Due to Truck Congestion (tons)						
Rank						
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)	1,430	1,415	1,400	1,390	1,375	1,355
Rank	25	26	26	26	26	25
Commuters (1000s)	634	617	601	587	572	554
Daily Vehicle-Miles of Travel (1000s)						
Freeway	10,200	9,750	9,550	9,195	8,900	8,675
Arterial Streets	13,255	12,800	12,115	11,500	10,955	10,700
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)	1.21	1.15	1.03	1.07	1.08	1.08
Diesel (\$/gallon)	1.29	1.22	1.09	1.13	1.17	1.21
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)	10,119	9,238	8,369	7,652	7,105	6,594
Rank	36	36	37	37	36	36
Fuel per Peak Auto Commuter (gallons)	14	13	12	11	10	9
Rank	18	19	21	22	24	27
Annual Delay						_,
Total Delay (1000s of person-hours)	24,319	22,201	20,113	18,390	17,075	15,846
Rank	33	34	34	34	34	34
Delay per Auto Commuter (pers-hrs)	34	32	29	27	26	25
Rank	33	34	42	45	41	39
Travel Time Index	1.15	1.14	1.13	1.12	1.11	1.11
Rank	40	41	43	45	49	46
Commuter Stress Index				- -		
Rank				<u></u>		
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	324	287	253	226	204	185
Rank	33	34	34	34	34	34
Cost per Auto Commuter (\$)	720	676	632	594	569	543
Rank	32	32	35	37	39	39
Truck Congestion	52	02				
Annual Person-Hours of Delay (000)	781	713	646	590	548	509
Rank	38	38	38	40	39	39
Annual Gallons of Wasted Fuel (000)	1,664	1,519	1,376	1,258	1,168	1,084
Rank	37	37	38	40	40	40
Annual Congestion Cost (\$ million)	23	20	18	16	15	14
Rank	37	38	38	41	39	38
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)				1	I	
Rank (tons)						
Due to Truck Travel (tons)						
Rank						
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^{*} Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1990	1989	1988	1987	1986	1985
Urban Area Information						
Population (1000s)	1,325	1,315	1,275	1,240	1,210	1,190
Rank	25	25	25	25	26	26
Commuters (1000s)	533	525	505	488	471	460
Daily Vehicle-Miles of Travel (1000s)						
Freeway	8,475	8,300	7,975	7,560	7,200	6,850
Arterial Streets	10,620	10,480	10,265	10,125	10,000	9,870
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	1.10	1.02	1.02	0.99	1.30
Diesel (\$/gallon)	1.08	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)	6,082	5,722	5,060	4,564	4,219	3,930
Rank	36	35	37	37	38	36
Fuel per Peak Auto Commuter (gallons)	9	8	7	6	5	6
Rank	23	26	27	32	40	22
Annual Delay						
Total Delay (1000s of person-hours)	14,617	13,751	12,160	10,969	10,139	9,444
Rank	34	34	34	32	30	29
Delay per Auto Commuter (pers-hrs)	24	23	21	19	18	17
Rank	39	37	38	43	42	38
Travel Time Index	1.10	1.10	1.09	1.08	1.08	1.08
Rank	47	44	44	45	43	40
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	164	147	124	108	96	90
Rank	34	34	34	33	31	30
Cost per Auto Commuter (\$)	524	522	484	456	436	413
Rank	36	34	38	36	35	35
Truck Congestion						
Annual Person-Hours of Delay (000)	470	442	391	353	326	304
Rank	39	39	39	39	39	40
Annual Gallons of Wasted Fuel (000)	1,000	941	832	751	693	646
Rank	39	38	39	39	39	39
Annual Congestion Cost (\$ million)	12	11	10	9	8	8
Rank	39	39	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)	 			 		
Due to All Travel (tons) Rank	 					
Due to All Travel (tons) Rank Truck Annual Greenhouse Gases (CO2) Produced	 			 		
Due to All Travel (tons) Rank Truck Annual Greenhouse Gases (CO2) Produced Excess Due to Truck Congestion (tons)	 			 		

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

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	1,150	1,125	1,100
Rank	26	28	28
Commuters (1000s)	442	429	415
Daily Vehicle-Miles of Travel (1000s)		.27	
Freeway	6,600	6,200	5,850
Arterial Streets	9,755	9,615	9,500
	7,733	7,013	7,500
Cost Components Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.31	1.34	1.41
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)	3,520	3,322	3,070
Rank	35	34	33
Fuel per Peak Auto Commuter (gallons)	4	4	3
Rank	41	35	34
Annual Delay			
Total Delay (1000s of person-hours)	8,460	7,985	7,377
Rank	29	29	29
Delay per Auto Commuter (pers-hrs)	16	16	15
Rank	41	33	33
Travel Time Index	1.07	1.07	1.06
Rank	42	40	42
Commuter Stress Index			
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	78	71	64
Rank	30	30	29
Cost per Auto Commuter (\$)	387	382	364
Rank	35	34	34
Truck Congestion			
Annual Person-Hours of Delay (000)	272	256	237
Rank	40	39	38
Annual Gallons of Wasted Fuel (000)	579	546	505
Rank	38	37	37
Annual Congestion Cost (\$ million)	7	6	6
Rank	35	37	35
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)			
	1		
Rank			
Rank Due to Truck Travel (tons)			

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