#### Performance Measure Summary - Riverside-San Bernardino CA

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)	2,100	2,100	2,090	2,075	2,050	2,035
Rank	22	22	22	21	21	22
Commuters (1000s)	1,127	1,127	1,122	1,114	1,100	1,091
Daily Vehicle-Miles of Travel (1000s)						
Freeway	23,038	28,797	28,884	26,237	26,238	26,070
Arterial Streets	10,478	13,097	13,807	13,554	13,498	12,363
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)	3.43	3.70	3.72	2.96	2.78	3.18
Diesel (\$/gallon)	3.80	3.95	4.03	2.95	2.68	2.86
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)				43.2		
Congested System (% of lane-miles)				24.8		
Congested Time (number of "Rush Hours")				6.5		
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	12,899	33,296	32,736	34,102	33,469	32,730
Rank	29	22	22	21	21	20
Fuel per Peak Auto Commuter (gallons)	7	19	19	20	20	19
Rank	90	62	58	47	47	50
Annual Delay						
Total Delay (1000s of person-hours)	38,687	99,863	103,110	107,411	105,419	103,091
Rank	24	20	19	18	18	18
Delay per Auto Commuter (pers-hrs)	25	64	67	70	68	66
Rank	55	17	12	11	11	11
Travel Time Index	1.08	1.33	1.34	1.34	1.34	1.33
Rank	44	13	10	11	11	11
Commuter Stress Index	1.09	1.45	1.43	1.44		
Rank	44	7	8	8		
Freeway Planning Time Index (95th Pctile)		2.05	2.03	2.10		
Rank		12	14	12		
Congestion Cost						
Total Cost (\$ millions)	872	2,171	2,251	2,291	2,211	2,138
Rank	24	20	19	18	18	18
Cost per Auto Commuter (\$)	511	1,272	1,325	1,359	1,342	1,305
Rank	60	20	19	16	16	15
Truck Congestion						
Annual Person-Hours of Delay (000)	1,644	4,488	4,501	4,511	4,428	4,330
Rank	31	18	18	18	18	18
Annual Gallons of Wasted Fuel (000)	2,690	7,342	7,372	7,359	7,319	7,281
Rank	31	20	18	18	17	17
Annual Congestion Cost (\$ million)	90	227	253	241	226	210
Rank	31	21	18	18	18	18
Annual Greenhouse Gases (CO2) Produced				1	1	
Excess Due to Congestion (tons)	129,994	335,554				
Rank	29	22				
Due to All Travel (tons)	2,793,245	7,210,205				
Rank	37	26				
Truck Annual Greenhouse Gases (CO2) Produced				1	1	
Excess Due to Truck Congestion (tons)	29,563	80,681				
Rank	31	19				
Due to Truck Travel (tons)	541,571	1,478,017				
Rank	49	32	1	i	i	

<sup>\*</sup> Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2014	2013	2012	2011	2010	2009
Urban Area Information						
Population (1000s)	2,020	2,005	1,990	1,980	1,970	1,960
Rank	22	22	22	22	22	22
Commuters (1000s)	1,081	1,073	1,056	1,045	1,038	1,028
Daily Vehicle-Miles of Travel (1000s)						
Freeway	23,134	23,865	22,865	22,302	21,994	23,212
Arterial Streets	14,203	15,113	15,650	14,021	13,827	13,700
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)	3.63	3.89	3.89	3.51	3.05	2.61
Diesel (\$/gallon)	3.85	4.12	4.20	4.02	3.20	2.71
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)	32,004	31,224	30,119	29,436	28,873	27,347
Rank	20	20	21	21	21	23
Fuel per Peak Auto Commuter (gallons)	18	17	17	17	18	15
Rank	57	64	61	60	46	62
Annual Delay						
Total Delay (1000s of person-hours)	100,804	98,348	94,868	92,717	90,943	86,135
Rank	18	18	18	17	16	16
Delay per Auto Commuter (pers-hrs)	62	60	59	58	58	56
Rank	12	11	11	11	10	10
Travel Time Index	1.33	1.32	1.31	1.31	1.31	1.30
Rank	11	12	13	11	11	11
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	2,100	2,016	1,915	1,847	1,740	1,610
Rank	18	18	18	17	16	16
Cost per Auto Commuter (\$)	1,271	1,251	1,223	1,234	1,247	1,203
Rank	13	13	13	13	12	13
Truck Congestion						
Annual Person-Hours of Delay (000)	4,234	4,131	3,984	3,894	3,820	3,618
Rank	18	18	18	17	17	16
Annual Gallons of Wasted Fuel (000)	7,247	7,197	7,006	6,974	6,905	6,664
Rank	17	17	17	17	17	17
Annual Congestion Cost (\$ million)	205	189	177	190	174	159
Rank	18	18	18	17	17	16
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						
Rank Due to Truck Travel (tons) Rank	 	 				

<sup>\*</sup> Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2008	2007	2006	2005	2004	2003
Urban Area Information						
Population (1000s)	1,970	1,950	1,910	1,870	1,855	1,775
Rank	22	22	22	22	22	23
Commuters (1000s)	1,026	1,010	984	961	947	901
Daily Vehicle-Miles of Travel (1000s)						
Freeway	23,470	24,210	24,510	24,020	22,760	20,500
Arterial Streets	13,645	12,945	13,170	12,965	12,000	11,800
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)	3.84	3.24	2.88	2.62	2.28	1.78
Diesel (\$/gallon)	4.39	3.60	3.17	2.93	2.27	1.79
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)	27,670	27,356	26,777	25,463	23,493	21,726
Rank	22	22	23	24	25	25
Fuel per Peak Auto Commuter (gallons)	17	17	18	17	16	15
Rank	61	61	47	48	56	58
Annual Delay						
Total Delay (1000s of person-hours)	87,153	86,165	84,340	80,201	73,996	68,430
Rank	16	16	16	16	18	18
Delay per Auto Commuter (pers-hrs)	57	58	58	57	54	52
Rank	8	9	7	8	9	11
Travel Time Index	1.31	1.32	1.33	1.32	1.30	1.29
Rank	9	9	7	8	12	11
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	1,670	1,575	1,491	1,368	1,212	1,080
Rank	16	16	16	17	18	18
Cost per Auto Commuter (\$)	1,205	1,239	1,245	1,225	1,168	1,109
Rank	12	11	13	13	14	16
Truck Congestion			2	2		<b>^</b> ~=:
Annual Person-Hours of Delay (000)	3,660	3,619	3,542	3,368	3,108	2,874
Rank	16	16 7 000	16	16	17	19
Annual Gallons of Wasted Fuel (000)	7,080	7,000	6,851	6,514	6,010	5,558
Rank	17	17	16	17	19	21
Annual Congestion Cost (\$ million) Rank	171 16	158 16	147 16	134 16	116 17	101 19
	10	10	10	10	1 /	19
Annual Greenhouse Gases (CO2) Produced				ı	I	
Excess Due to Congestion (tons)  Rank						
Nank Due to All Travel (tons)						
Rank						 -
Truck Annual Greenhouse Gases (CO2) Produced				ı	I	
Excess Due to Truck Congestion (tons)  Rank						
Nank Due to Truck Travel (tons)						
Rank				 		
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<sup>\*</sup> Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	2002	2001	2000	1999	1998	1997
Urban Area Information						
Population (1000s)	1,715	1,630	1,575	1,525	1,485	1,445
Rank	24	25	25	25	25	25
Commuters (1000s)	867	827	795	764	740	722
Daily Vehicle-Miles of Travel (1000s)						
Freeway	18,500	17,400	16,600	16,270	15,580	14,940
Arterial Streets	11,700	11,575	11,220	11,100	11,275	11,210
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)	1.66	1.93	1.72	1.59	1.27	1.40
Diesel (\$/gallon)	1.58	1.78	1.68	1.50	1.39	1.51
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)	19,907	18,165	17,064	15,724	14,323	13,354
Rank	26	26	27	28	29	30
Fuel per Peak Auto Commuter (gallons)	14	12	12	11	10	8
Rank	61	74	68	72	73	79
Annual Delay						
Total Delay (1000s of person-hours)	62,702	57,216	53,748	49,527	45,115	42,062
Rank	20	20	20	20	20	20
Delay per Auto Commuter (pers-hrs)	49	47	46	44	42	40
Rank	12	12	14	15	15	17
Travel Time Index	1.27	1.26	1.26	1.24	1.23	1.22
Rank	13	14	13	15	18	21
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	965	871	792	704	625	576
Rank	20	20	20	20	20	21
Cost per Auto Commuter (\$)	1,038	960	927	883	823	780
Rank	18	22	23	24	25	25
Truck Congestion						
Annual Person-Hours of Delay (000)	2,633	2,403	2,257	2,080	1,895	1,767
Rank	21	21	21	22	22	22
Annual Gallons of Wasted Fuel (000)	5,093	4,647	4,366	4,023	3,664	3,417
Rank	21	23	22	22	25	25
Annual Congestion Cost (\$ million)	88	79	71	63	56	52
Rank	21	21	21	22	22	22
Annual Greenhouse Gases (CO2) Produced					1	
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Greenhouse Gases (CO2) Produced					1	
Excess Due to Truck Congestion (tons)						
Rank						
Due to Truck Travel (tons)						
Rank						

<sup>\*</sup> 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	1,420	1,410	1,395	1,380	1,350
Rank	25	25	25	25	25	26
Commuters (1000s)	711	703	695	685	676	658
Daily Vehicle-Miles of Travel (1000s)						
Freeway	14,985	14,780	14,015	13,690	13,605	13,460
Arterial Streets	11,200	11,175	11,150	11,100	10,750	10,650
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	1.27	1.16	1.23	1.28	1.11
Diesel (\$/gallon)	1.24	1.31	1.19	1.26	1.25	1.25
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)	12,721	12,224	11,520	11,028	10,414	9,844
Rank	30	29	29	28	28	27
Fuel per Peak Auto Commuter (gallons)	8	8	7	7	7	7
Rank	76	72	73	67	59	57
Annual Delay						
Total Delay (1000s of person-hours)	40,068	38,501	36,285	34,736	32,801	31,006
Rank	20	20	20	20	20	19
Delay per Auto Commuter (pers-hrs)	38	37	36	34	33	32
Rank	17	17	15	16	16	14
Travel Time Index	1.21	1.21	1.20	1.19	1.18	1.18
Rank	19	16	18	19	18	16
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	534	500	458	429	395	362
Rank	21	21	21	20	20	19
Cost per Auto Commuter (\$)	761	752	730	718	699	682
Rank	25	25	25	22	22	22
Truck Congestion						4
Annual Person-Hours of Delay (000)	1,683	1,617	1,524	1,459	1,378	1,302
Rank	22	22	22	22	21	21
Annual Gallons of Wasted Fuel (000)	3,255	3,127	2,948	2,822	2,665	2,518
Rank	24	24	24	23	22	22
Annual Congestion Cost (\$ million) Rank	48 23	46 22	42 22	40 22	38 21	35 21
	23	22	22	22	Δ1	21
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						
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<sup>\*</sup> Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1990	1989	1988	1987	1986	1985
Urban Area Information						
Population (1000s)	1,285	1,190	1,120	1,075	1,030	1,005
Rank	26	27	31	31	34	33
Commuters (1000s)	617	577	541	516	491	477
Daily Vehicle-Miles of Travel (1000s)						
Freeway	12,380	11,735	10,575	9,865	8,940	8,200
Arterial Streets	10,150	9,370	9,150	8,900	8,870	8,760
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)	1.14	1.14	1.05	1.05	1.03	1.35
Diesel (\$/gallon)	1.19	1.09	1.01	1.01	0.99	1.29
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)	8,698	7,782	6,999	6,021	5,613	5,175
Rank	28	28	27	27	27	26
Fuel per Peak Auto Commuter (gallons)	6	6	5	4	4	3
Rank	60	53	58	61	54	66
Annual Delay						
Total Delay (1000s of person-hours)	27,398	24,510	22,045	18,966	17,680	16,301
Rank	19	19	20	22	23	22
Delay per Auto Commuter (pers-hrs)	30	29	28	25	24	23
Rank	16	16	17	18	18	17
Travel Time Index	1.17	1.16	1.15	1.14	1.13	1.13
Rank	17	17	18	20	20	19
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	308	263	226	188	169	155
Rank	19	19	20	22	23	22
Cost per Auto Commuter (\$)	629	595	561	507	489	460
Rank	23	24	24	27	28	29
Truck Congestion						
Annual Person-Hours of Delay (000)	1,151	1,029	926	797	743	685
Rank	21	21	21	21	22	22
Annual Gallons of Wasted Fuel (000)	2,225	1,991	1,791	1,541	1,436	1,324
Rank	22	23	22	23	23	23
Annual Congestion Cost (\$ million)	30	27	24	20	18	17
Rank	21	21	21	21	22	22
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
Rank						
Truck Annual Creenhouse Coses (CO2) Produced		I				
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)		  		  	  	  

<sup>\*</sup> Note: Zeroes in the table reflect values less than 0.5.

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	985	970	955
Rank	33	34	34
Commuters (1000s)	464	455	446
Daily Vehicle-Miles of Travel (1000s)			
Freeway	7,865	6,795	6,290
Arterial Streets	8,650	8,260	7,880
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.36	1.39	1.46
Diesel (\$/gallon)	1.31	1.34	1.40
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)	4,735	4,335	3,967
Rank	27	27	27
Fuel per Peak Auto Commuter (gallons)	3	3	2
Rank	61	46	55
Annual Delay			
Total Delay (1000s of person-hours)	14,913	13,655	12,496
Rank	22	22	21
Delay per Auto Commuter (pers-hrs)	22	20	19
Rank	17	18	17
Travel Time Index	1.12	1.11	1.10
Rank	20	18	20
Commuter Stress Index			
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	137	121	108
Rank	22	22	22
Cost per Auto Commuter (\$)	436	418	393
Rank	31	28	29
Truck Congestion			
Annual Person-Hours of Delay (000)	626	574	525
Rank	22	22	21
Annual Gallons of Wasted Fuel (000)	1,211	1,109	1,015
Rank	23	23	23
Annual Congestion Cost (\$ million)	16	14	13
Rank	22	22	21
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			

<sup>\*</sup> Note: Zeroes in the table reflect values less than 0.5.