#### Performance Measure Summary - Las Vegas-Henderson NV

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)	2,140	2,140	2,100	2,070	2,030	2,000
Rank	21	21	21	22	22	24
Commuters (1000s)	1,060	1,060	1,040	1,025	1,009	994
Daily Vehicle-Miles of Travel (1000s)						
Freeway	11,245	13,403	13,000	12,787	12,320	12,031
Arterial Streets	14,452	17,225	16,900	16,510	15,821	15,149
Cost Components	,	,	,	,		
Value of Time (\$/hour)	20.17	19.14	18.71	18.12	17.91	17.69
Commercial Cost (\$/hour)	55.24	61.03	54.71	52.14	50.20	46.87
Gasoline (\$/gallon)	2.27	3.15	3.25	2.63	2.48	2.96
Diesel (\$/gallon)	3.04	3.18	3.43	2.69	2.49	2.72
System Performance	2020	2019	2018	2017	2016	2015
Congested Travel (% of peak VMT)				22.7		
Congested System (% of lane-miles)				12.1		
Congested Time (number of "Rush Hours")				3.0		
Annual Excess Fuel Consumed						
Total Fuel (1000 gallons)	8,784	24,594	24,234	23,662	22,927	22,758
Rank	41	31	30	31	31	31
Fuel per Peak Auto Commuter (gallons)	7	20	20	20	19	18
Rank	90	52	47	47	53	58
Annual Delay						
Total Delay (1000s of person-hours)	21,702	60,761	60,149	59,761	56,960	56,055
Rank	42	29	29	29	29	29
Delay per Auto Commuter (pers-hrs)	18	50	51	51	50	49
Rank	87	41	34	34	33	33
Travel Time Index	1.07	1.25	1.25	1.25	1.25	1.24
Rank	57	25	25	24	24	26
Commuter Stress Index	1.07	1.26	1.26	1.27		
Rank	75	37	35	27		
Freeway Planning Time Index (95th Pctile)		1.59	1.68	1.63		
Rank		37	33	36		
Congestion Cost						
Total Cost (\$ millions)	487	1,337	1,311	1,275	1,196	1,169
Rank	42	29	29	29	29	29
Cost per Auto Commuter (\$)	363	997	997	983	941	922
Rank	88	43	42	41	43	41
Truck Congestion						
Annual Person-Hours of Delay (000)	1,003	2,343	2,331	2,286	2,179	2,144
Rank	43	35	33	32	33	32
Annual Gallons of Wasted Fuel (000)	1,547	3,615	3,567	3,488	3,379	3,354
Rank	44	38	37	38	38	38
Annual Congestion Cost (\$ million)	53	139	128	120	110	103
Rank	43	32	33	33	33	32
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)	87,680	245,484				
Rank	42	31				
Due to All Travel (tons)	2,189,676	6,130,603				
Rank	47	35				
Truck Annual Greenhouse Gases (CO2) Produced						
Excess Due to Truck Congestion (tons)	17,067	39,874				
Rank	44	38				
Due to Truck Travel (tons)	596,861	1,394,432				
Rank	42	34				

<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)	1,975	1,925	1,880	1,830	1,800	1,745
Rank	24	24	24	25	25	29
Commuters (1000s)	982	968	953	940	924	893
Daily Vehicle-Miles of Travel (1000s)						
Freeway	11,392	11,011	10,990	11,980	11,600	11,200
Arterial Streets	15,005	14,499	15,150	15,145	14,700	14,000
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)	3.43	3.62	3.54	3.40	2.86	2.48
Diesel (\$/gallon)	3.71	3.89	3.93	3.73	3.00	2.59
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)	22,420	22,157	21,602	21,368	21,538	21,818
Rank	31	31	32	31	28	27
Fuel per Peak Auto Commuter (gallons)	18	18	18	18	18	18
Rank	57	54	52	49	46	34
Annual Delay						
Total Delay (1000s of person-hours)	54,272	52,695	50,916	49,458	48,936	48,645
Rank	29	29	29	29	28	28
Delay per Auto Commuter (pers-hrs)	47	46	46	45	44	43
Rank	34	34	34	34	33	31
Travel Time Index	1.24	1.24	1.24	1.24	1.25	1.26
Rank	26	26	25	24	21	19
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	1,141	1,092	1,039	998	947	920
Rank	29	29	29	30	28	28
Cost per Auto Commuter (\$)	889	870	852	853	871	881
Rank	41	43	45	44	42	38
Truck Congestion						
Annual Person-Hours of Delay (000)	2,076	2,015	1,948	1,892	1,872	1,861
Rank	32	33	32	31	31	29
Annual Gallons of Wasted Fuel (000)	3,305	3,266	3,184	3,150	3,175	3,216
Rank	38	37	37	35	35	34
Annual Congestion Cost (\$ million)	99	90	85	90	84	81
Rank	33	33	33	32	31	30
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	 	 		 	 	 
Excess Due to Truck Congestion (tons)		  		  	  	  

<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)	1,715	1,685	1,650	1,620	1,575	1,545
Rank	29	29	29	28	30	30
Commuters (1000s)	874	853	829	808	782	763
Daily Vehicle-Miles of Travel (1000s)						
Freeway	10,805	11,510	10,700	10,000	9,400	8,700
Arterial Streets	13,695	14,255	14,400	13,600	12,900	12,310
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)	3.56	3.20	2.79	2.55	2.16	1.70
Diesel (\$/gallon)	4.14	3.51	2.98	2.77	2.15	1.65
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)	23,053	22,534	21,591	20,997	19,770	18,666
Rank	26	27	30	28	30	30
Fuel per Peak Auto Commuter (gallons)	20	20	19	19	19	18
Rank	31	28	36	34	27	30
Annual Delay						
Total Delay (1000s of person-hours)	48,951	47,848	45,847	44,586	41,979	39,637
Rank	28	28	28	28	28	29
Delay per Auto Commuter (pers-hrs)	45	45	44	44	44	43
Rank	27	29	29	27	27	27
Travel Time Index	1.28	1.28	1.27	1.27	1.26	1.26
Rank	16	17	19	18	20	18
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	957	895	826	774	698	633
Rank	28	28	28	28	28	29
Cost per Auto Commuter (\$)	879	891	879	884	860	833
Rank	35	36	37	39	40	41
Truck Congestion						
Annual Person-Hours of Delay (000)	1,872	1,831	1,753	1,705	1,606	1,517
Rank	27	29	29	29	30	30
Annual Gallons of Wasted Fuel (000)	3,398	3,322	3,183	3,095	2,914	2,752
Rank	34	35	35	34	34	37
Annual Congestion Cost (\$ million)	85	79	71	67	59	52
Rank	29	30	29	29	30	30
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	2002	2001	2000	1999	1998	1997
Urban Area Information						
Population (1000s)	1,500	1,455	1,410	1,360	1,300	1,270
Rank	29	30	32	32	32	33
Commuters (1000s)	730	696	664	629	592	569
Daily Vehicle-Miles of Travel (1000s)						
Freeway	8,000	7,730	6,850	6,270	5,880	5,485
Arterial Streets	11,790	11,225	11,285	11,140	10,560	10,475
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)	1.60	1.71	1.71	1.57	1.22	1.38
Diesel (\$/gallon)	1.54	1.69	1.66	1.45	1.35	1.47
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)	17,275	15,924	14,909	14,024	12,781	12,045
Rank	31	31	32	32	32	32
Fuel per Peak Auto Commuter (gallons)	16	15	14	13	12	11
Rank	42	47	50	51	53	54
Annual Delay	12	.,	30	J1	33	J 1
Total Delay (1000s of person-hours)	36,683	33,814	31,658	29,779	27,140	25,576
Rank	29	33,814	31,038	31	32	33
Delay per Auto Commuter (pers-hrs)	43	42	41	41	39	38
Rank	27	26	24	21	22	19
Travel Time Index	1.25	1.24	1.24	1.23	1.23	1.22
Rank	1.23	22	1.24	21	1.23	21
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)					<u></u>	
Rank						
Congestion Cost						
Total Cost (\$ millions)	571	520	474	429	380	354
Rank	31	31	31	31	32	32
Cost per Auto Commuter (\$)	789	737	708	690	643	614
Rank	44	49	51	53	57	55
Truck Congestion	T-1	77	J1	55	31	
Annual Person-Hours of Delay (000)	1,403	1,293	1,211	1,139	1,038	978
Rank	31	31	32	33	35	35
Annual Gallons of Wasted Fuel (000)	2,547	2,347	2,198	2,067	1,884	1,775
Rank	38	39	38	38	38	38
Annual Congestion Cost (\$ million)	47	42	38	34	30	29
Rank	30	31	32	33	35	34
Annual Greenhouse Gases (CO2) Produced	50	<i>J</i> 1	32	33	33	J- <b>T</b>
Excess Due to Congestion (tons)				ı	I	
Rank						
Nank Due to All Travel (tons)						
Rank			 			
Truck Annual Greenhouse Gases (CO2) Produced					I	
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)	1,200	1,100	1,020	935	860	780
Rank	33	34	36	39	40	43
Commuters (1000s)	529	477	436	393	356	317
Daily Vehicle-Miles of Travel (1000s)						
Freeway	5,580	4,870	4,540	4,100	3,800	3,505
Arterial Streets	9,825	8,900	7,930	7,435	6,690	5,980
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)	1.39	1.29	1.25	1.28	1.32	1.17
Diesel (\$/gallon)	1.44	1.34	1.29	1.32	1.33	1.27
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		İ				
Total Fuel (1000 gallons)	11,049	9,841	8,749	7,700	6,589	5,583
Rank	33	34	35	36	38	39
Fuel per Peak Auto Commuter (gallons)	10	9	9	8	7	6
Rank	57	59	56	58	59	67
Annual Delay						
Total Delay (1000s of person-hours)	23,462	20,895	18,577	16,351	13,991	11,855
Rank	35	35	36	36	36	38
Delay per Auto Commuter (pers-hrs)	37	37	35	34	32	30
Rank	19	17	17	16	17	20
Travel Time Index	1.22	1.21	1.20	1.20	1.19	1.17
Rank	15	16	18	15	15	18
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	318	275	238	205	171	140
Rank	35	35	36	36	36	39
Cost per Auto Commuter (\$)	577	530	484	438	387	339
Rank	58	60	63	69	73	76
Truck Congestion						
Annual Person-Hours of Delay (000)	897	799	711	626	535	454
Rank	35	36	37	37	40	41
Annual Gallons of Wasted Fuel (000)	1,629	1,450	1,290	1,135	971	823
Rank	38	40	41	45	45	47
Annual Congestion Cost (\$ million)	26	23	20	17	15	12
Rank	34	35	36	37	39	42
Annual Greenhouse Gases (CO2) Produced						
Excess Due to Congestion (tons)						
Rank						
Due to All Travel (tons)						
		I				
Rank						
Truck Annual Greenhouse Gases (CO2) Produced						
Truck Annual Greenhouse Gases (CO2) Produced  Excess Due to Truck Congestion (tons)  Rank		  				 
Truck Annual Greenhouse Gases (CO2) Produced Excess Due to Truck Congestion (tons)		  		  		  

<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)	700	650	610	570	525	490
Rank	45	48	50	53	55	57
Commuters (1000s)	280	259	240	223	204	189
Daily Vehicle-Miles of Travel (1000s)						
Freeway	3,320	2,590	2,220	1,990	1,580	1,220
Arterial Streets	5,730	5,395	5,350	5,160	4,985	4,945
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)	1.20	1.23	1.14	1.14	1.11	1.45
Diesel (\$/gallon)	1.24	1.22	1.13	1.13	1.10	1.44
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)	4,612	3,838	3,292	2,795	2,221	1,791
Rank	43	46	49	50	55	60
Fuel per Peak Auto Commuter (gallons)	5	5	4	4	2	2
Rank	72	63	71	61	84	84
Annual Delay						
Total Delay (1000s of person-hours)	9,793	8,151	6,990	5,935	4,716	3,803
Rank	40	44	47	48	53	58
Delay per Auto Commuter (pers-hrs)	28	26	24	22	19	16
Rank	21	23	26	28	35	45
Travel Time Index	1.16	1.14	1.13	1.13	1.11	1.10
Rank	19	23	23	22	27	27
Commuter Stress Index						
Rank						
Freeway Planning Time Index (95th Pctile)						
Rank						
Congestion Cost						
Total Cost (\$ millions)	112	89	73	60	46	37
Rank	40	44	46	48	52	57
Cost per Auto Commuter (\$)	291	258	233	207	169	139
Rank	82	85	86	86	92	93
Truck Congestion	27.1	212	267	227	101	1.45
Annual Person-Hours of Delay (000)	374	312	267	227	181	145
Rank	46	48 566	50	51	58	62 264
Annual Gallons of Wasted Fuel (000)	680	566	485	412	327	264
Rank Annual Congestion Cost (\$ million)	52 10	53 8	55 7	58 6	62 4	68 4
Rank	44	8 47	46	48	58	53
Annual Greenhouse Gases (CO2) Produced	7-7	4/	40	70	50	33
Excess Due to Congestion (tons)				ı		
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						<u></u>
17th						

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

Inventory Measures	1984	1983	1982
Urban Area Information			
Population (1000s)	475	460	450
Rank	59	60	60
Commuters (1000s)	182	175	169
Daily Vehicle-Miles of Travel (1000s)			
Freeway	1,000	970	950
Arterial Streets	4,675	4,380	4,085
Cost Components			
Value of Time (\$/hour)	7.75	7.43	7.20
Commercial Cost (\$/hour)	23.94	23.63	23.31
Gasoline (\$/gallon)	1.47	1.50	1.57
Diesel (\$/gallon)	1.46	1.49	1.56
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)	1,529	1,478	1,205
Rank	60	58	61
Fuel per Peak Auto Commuter (gallons)	1	1	1
Rank	87	86	82
Annual Delay			
Total Delay (1000s of person-hours)	3,247	3,140	2,558
Rank	59	57	62
Delay per Auto Commuter (pers-hrs)	14	14	12
Rank	48	44	47
Travel Time Index	1.09	1.09	1.07
Rank	30	28	36
Commuter Stress Index	30	26	
Rank			
Freeway Planning Time Index (95th Pctile)			
Rank			
Congestion Cost			
Total Cost (\$ millions)	31	29	23
Rank	58	57	60
Cost per Auto Commuter (\$)	123	123	107
Rank	94	92	92
	74	72	- 72
Truck Congestion	125	120	98
Annual Person-Hours of Delay (000)  Rank	64	62	65
Annual Gallons of Wasted Fuel (000)	226	218	178
Rank	70	67	70
Annual Congestion Cost (\$ million)	3	3	2
Rank	58	54	65
	36	34	0.5
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			

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