CALIFORNIA DEPARTMENT OF TRANSPORTATION

2011 CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION DETERMINATION REPORT

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Office of Traffic Management

Submitted to

Federal Highway Administration
California Division

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EXECUTIVE SUMMARY

Federal law authorizes States to allow inherently low-emission vehicles (ILEVs), certain gasoline/electric hybrid vehicles, and toll-paying vehicles to access high–occupancy vehicle (HOV) lanes without meeting occupancy requirements.[1] States that allow these vehicles to use HOV lanes are required to monitor and report on the performance of those lanes. An HOV lane is considered degraded if the average speed of traffic during morning or evening weekday peak hour periods is less than 45 miles per hour (mph) 10 percent or more of the time over a consecutive 180-day period. In other words, the average speed cannot go below 45 mph more than once every two weeks or twice a month. If the lane is degraded, the State must either limit or discontinue the use of the lane by the exempt vehicles or take other actions that will bring the operational performance up to the federal standard within 180 days after identifying the lane as degraded.

As authorized under federal law, State laws allow ILEVs, certain classes of hybrid vehicles, and toll-paying vehicles to use HOV lanes without meeting occupancy requirements. ILEVs and hybrid vehicles are required to have a decal issued by the Department of Motor Vehicles; an unlimited number of decals are allowed for ILEVs, and up to 85,000 decals were allowed for the hybrid vehicles.[2] The access program for these vehicles ended on July 1, 2011. Toll-paying vehicles are allowed in certain HOV lanes.[3] HOV lanes that are used by toll-paying vehicles are also known as high-occupancy/toll lanes or express lanes.

To meet the federal reporting requirements, the California Department of Transportation (Caltrans) prepared the "2011 California High-occupancy Vehicle Lane Degradation Determination Report." This report analyzes the performance of HOV lanes in California.

In 2011, Caltrans operated approximately 1,425 lane-miles of HOV lanes on the State Highway System. Caltrans only monitored approximately 1,326 lane-miles of HOV lanes in 2011due to the lack of detection available on the entire HOV lane system. Table 1 summarizes degradation on the monitored segments in the 2011 calendar year. The locations of the degraded segments are shown in Figures 1 through 4.

[1] Refer to title 23, United States Code, section 166

[2] Refer to Vehicle Code sections 5205.5 and 21655.9

[3] Refer to Streets and Highways Code sections 149.1 and 149.4 through 149.10

Table 1 2011 STATEWIDE HOV LANE DEGRADATION SUMMARY		
	First 180-Day Period January to June 2011	**Second 180-Day Period July to December 2011**
Degraded	43% (572 lane-miles)	49% (656 lane-miles)
Not Degraded	57% (754 lane-miles)	51% (670 lane-miles)
Total	100% (1326 lane-miles)	100% (1326 lane-miles)

In 2011, the HOV lanes carried about 13 percent of the traffic on the freeways during the morning peak hour and 15 percent during the evening peak hour. Given these usages and the low threshold for degradation, it is difficult for the State to meet the federal performance standard.

After July 1, 2011, hybrid vehicles were not permitted to use HOV lanes unless they met occupancy requirements. The data shows that degradation actually increased in the second half of the year. This increase was observed in previous years; congestion levels typically increase on all freeway lanes in the latter portion of the calendar year. While a full year of data would allow a complete assessment of the impacts of the decaled vehicles, the data indicates that recurrent congestion and other contributing factors lead to degradation. These other factors could include:

- Vehicles from general-purpose lanes merging into the HOV lane at the end of the HOV facility, causing congestion in the lane upstream.
- Vehicles from the HOV lanes merging into congested general-purpose lanes.
- “Rubbernecking” due to traffic incidents on a freeway.
- Inclement weather resulting in lower speeds.

Because degradation tends to increase in the second half of the year, Caltrans and the Federal Highway Administration (FHWA) agreed that action needs to only be taken on facilities identified as degraded in the second half of 2011. As part of the federal requirements, Caltrans is reviewing the data to identify possible causes of degradation and developing an action plan to bring degraded lanes into compliance. This action plan has been provided to the FHWA as a supplement to this report.

Figure 1

DEGRADED HOV LANES IN NORTHERN CALIFORNIA
JANUARY 1 TO JUNE 30, 2011

Figure 2

DEGRADED HOV LANES IN SOUTHERN CALIFORNIA
JANUARY 1 TO JUNE 30, 2011

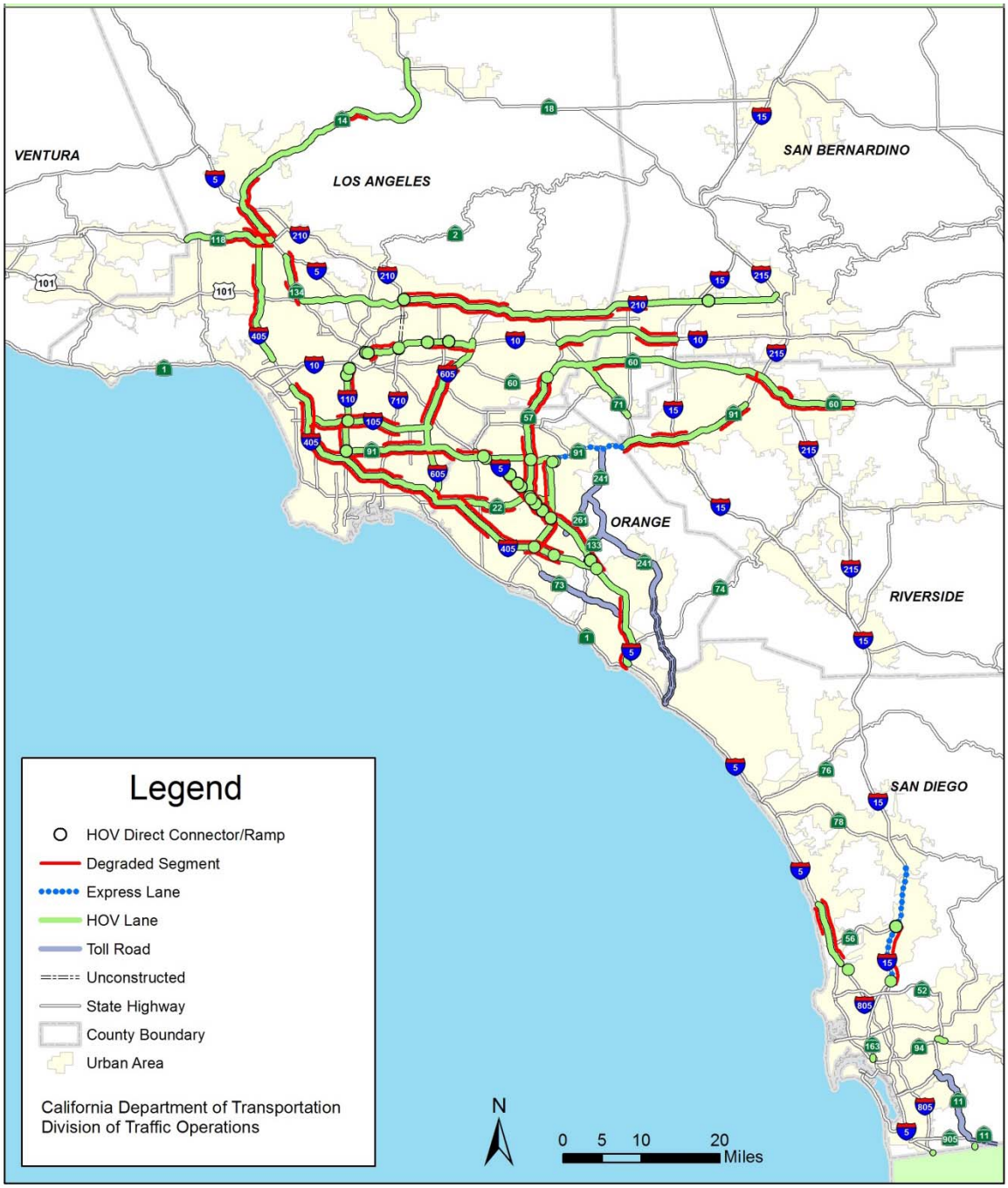

Figure 3

DEGRADED HOV LANES IN NORTHERN CALIFORNIA
JULY 1 TO DECEMBER 31, 2011

Figure 4

DEGRADED HOV LANES IN SOUTHERN CALIFORNIA
JULY 1 TO DECEMBER 31, 2011

1. DETERMINATION METHODOLOGY

An HOV lane is considered degraded if the average speed of traffic during morning or evening weekday peak hour periods is less than 45 miles per hour (mph) 10 percent or more of the time over a consecutive 180-day period.

Degradation was determined using highway speed and volume data collected from traffic monitoring systems, such as in ground loop detectors or microwave vehicle detection systems. This data was then transmitted to the Freeway Performance Measurement System, which stores the data for every freeway in California. Data was collected throughout the two 180-day periods. The first 180-day period was from January 1 to June 30, 2011 and the second from July 1 to December 31, 2011. All weekday data, including weekday holidays, was analyzed for each of these periods; weekend data was omitted since the federal standard only applies to weekdays. There were 129 weekdays during the first half of the year and 131 weekdays in the second half of the year. For each of these weekdays, the data was processed as follows:

- Aggregated data for each HOV facility was broken into multiple segments for easier location specific analysis. Each segment is a maximum of five miles in length.

- Peak hour data for each segment was taken from 8:00 a.m. to 9:00 a.m. and from 5:00 p.m. to 6:00 p.m. These two peak hour periods were selected based on an analysis of the typical statewide peak travel delay.

- The peak hour effective speed across each segment was calculated by dividing the total vehicle miles traveled by the total vehicle hours traveled.

- For each segment, the days during which the average morning or evening peak hour speed was below 45 mph were counted. The total number of available weekdays with recorded data also was counted for each segment.

- The number of days during which the average morning or evening peak hour speed was below 45 mph was divided by the number of total available weekdays. If this value exceeded 10 percent of the total days in the analysis period, the HOV lane segment was identified as degraded.

The total number of lane-miles monitored Statewide (1,326.5) was approximately 98 lane-miles less than the system mileage (1,424.9). This was due to a lack of detection on some segments. In addition, the number of lane-miles monitored during the morning peak hour period and evening peak hour period varied. While most HOV lanes in California are in operation in both directions during both peak hour periods, there are a few that operate only

in the peak direction during the peak hour. The number of lane-miles monitored during the morning and evening peak hour periods can be obtained as follows:

For the morning peak hour period:

Total segments statewide	1,424.9 lane-miles
- Non-operational segments[4]	- 70.4 lane-miles
- Total segments for which no data is available	- 98.4 lane-miles
+ Non-operational segments for which no data is available[5]	+ 9.0 lane-miles
Total morning peak hour segments monitored	1,265.1 lane-miles

For the evening peak hour period:

Total segments statewide	1,424.9 lane-miles
- Non-operational segments[6]	- 67.4 lane-miles
- Total segments for which no data is available	- 98.4 lane-miles
- Non-operational segments for which no data is available[7]	+ 9.0 lane-miles
Total morning peak hour segments monitored	1,268.1 lane-miles

Caltrans categorized degradation into three classes–slightly degraded, very degraded, and extremely degraded. This categorization is useful in separating daily recurrent congestion from nonrecurring congestion. Criteria for each category are as follows:

- Slightly Degraded. Degradation occurs from 10 to 49 percent of the time, or approximately 2 to 9 weekdays per month.
- Very Degraded. Degradation occurs from 50 to 74 percent of the time, equivalent to 10 to 15 weekdays per month.
- Extremely Degraded. Degradation occurs 75 percent or more of the time, or about 16 or more weekdays per month.

Slightly degraded HOV lane segments may be congested because of the effects of weather, traffic incidents, and special events. Very degraded and extremely degraded segments appear to have recurrent congestion.

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[4] These segments include northbound Route 101 in Marin County (18.1 lane-miles), eastbound Route 4 in Contra Costa County (8.6 lane-miles), northbound Route 14 in Los Angeles County (35.9 lane-miles) and a portion of Route 15 in San Diego County (7.8 lane-miles).

[5, 7] This adjusts for two segments on Route 14 in the off-peak direction for which no data was available.

[6] These segments include southbound Route 101 in Marin County (15.1 lane-miles), westbound Route 4 in Contra Costa County (8.6 lane-miles), southbound Route 14 in Los Angeles County (35.9 lane-miles) and a portion of Route 15 in San Diego County (7.8 lane-miles).

2. ANALYSIS RESULTS—JANUARY TO JUNE 2011

During the first 180-day period of 2011, approximately 43 percent (572 of 1326 lane-miles) of all monitored HOV lane segments were degraded and 57 percent (754 lane-miles) were not degraded. As shown in Figure 5, 11 percent (143 of 1326 lane-miles) of all monitored HOV segments were degraded only during the morning peak hour period, 24 percent (326 lane-miles) were degraded only during the evening peak hour period, and 8 percent (103 lane-miles) were degraded during both the morning and evening peak hour periods.

Figure 6 provides a summary of degradation by district; District 7 experienced the most degradation, with nearly 38 percent of all degraded segments (approximately 220 of 1326 lane-miles).

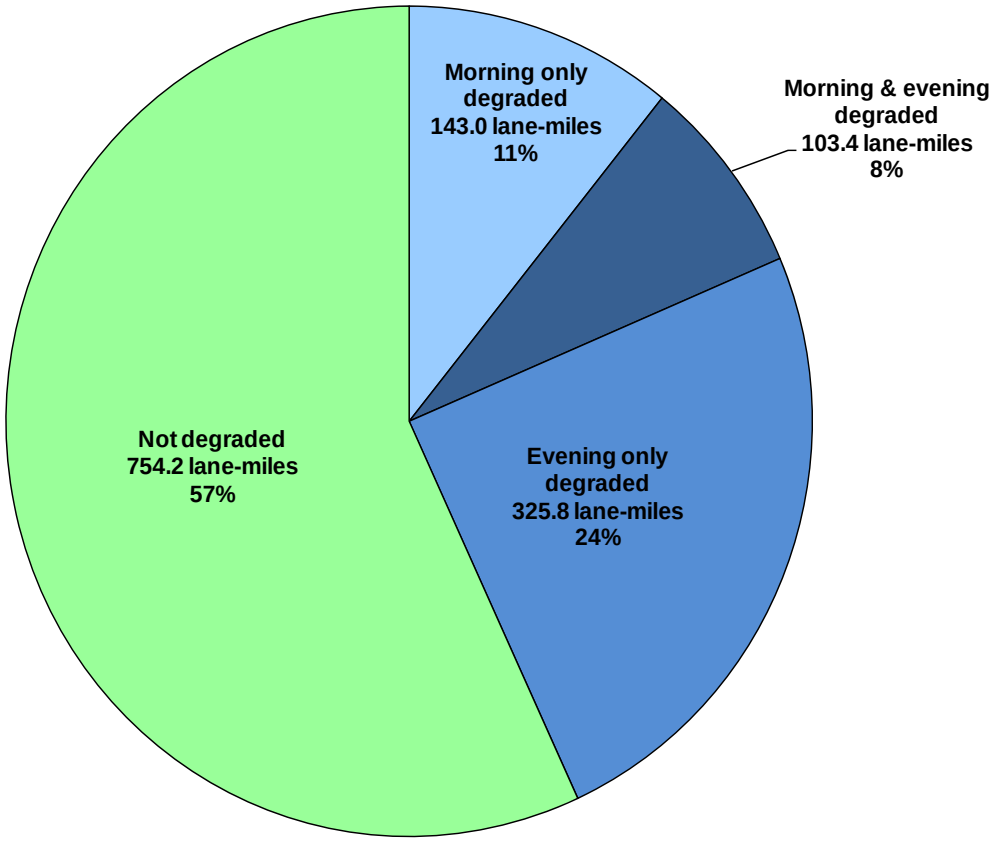
Figure 7 shows the number of degraded lane-miles in each district during the morning peak hour period. Figure 8 shows the frequency of degradation on all monitored segments that were operating during the morning peak hour period. About 20 percent (246 of 1265 lane-miles) were degraded; 2 percent (20 lane-miles) were categorized as extremely degraded, 5 percent (63 lane-miles) were categorized as very degraded, and about 13 percent (164 lane-miles) were slightly degraded.

Figure 9 shows the number of degraded lane-miles in each district during the morning peak hour period. The frequency of degradation on all monitored segments that were operating during the evening peak hour period is shown in Figure 10. Degradation was more prevalent and more frequent in this peak hour period. About 34 percent (429 of 1268 lane-miles) of the segments monitored during the evening peak hour were degraded; 10 percent (130 lane-miles) were categorized as extremely degraded, 5 percent (56 lane-miles) were categorized as very degraded and the remaining 19 percent (245 lane-miles) were slightly degraded.

Table 2 shows the locations of degraded HOV lane segments for the first six-month period, including the peak period(s) where degradation was observed, the number of days it was observed, and the degradation category.

Figure 5

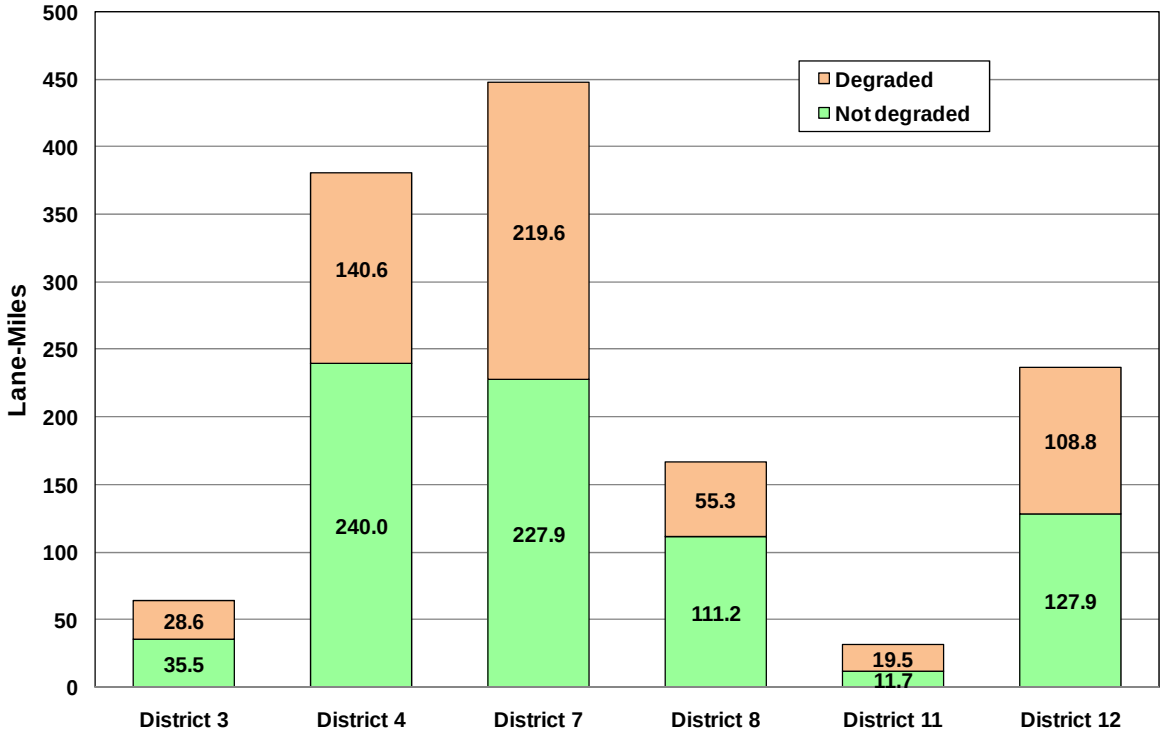
STATEWIDE DEGRADATION SUMMARY BY PEAK HOUR
JANUARY 1 TO JUNE 30, 2011



NOTE: 1326.5 lane-miles total; numbers may not add up due to rounding.

Figure 6

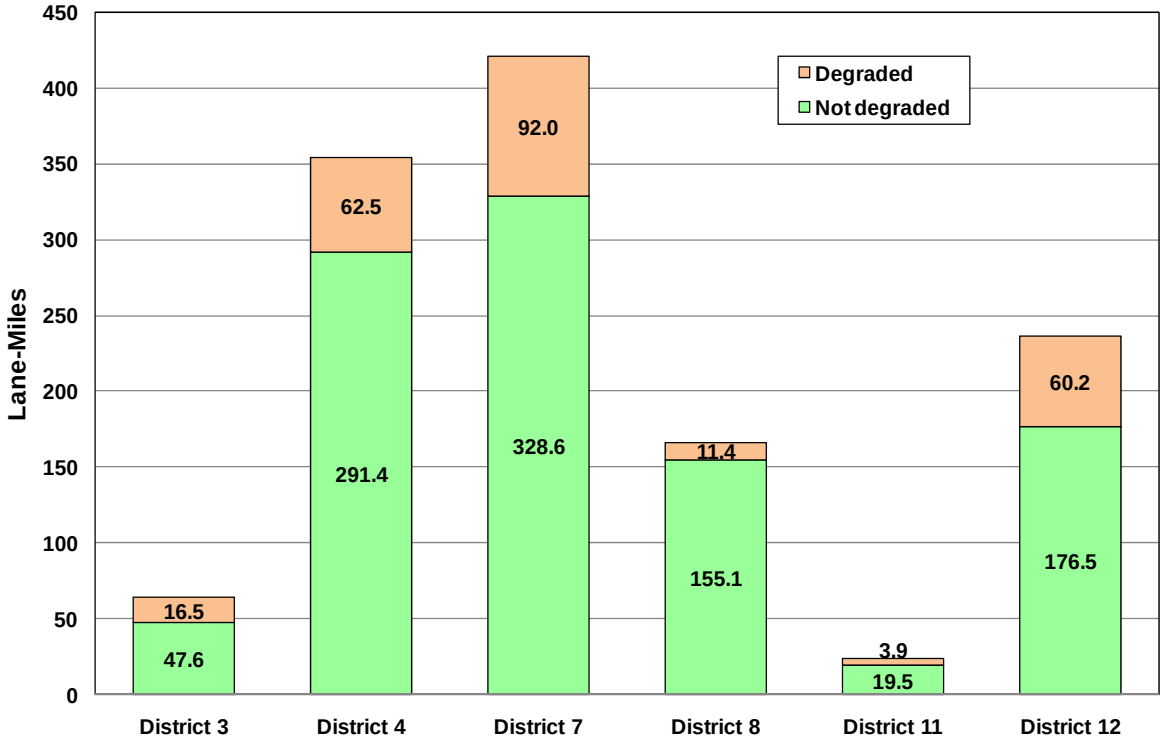
STATEWIDE DEGRADED HOV LANE-MILE SUMMARY BY DISTRICT
JANUARY 1 TO JUNE 30, 2011



NOTE: 1326.5 lane-miles total; numbers may not add up due to rounding.

Figure 7

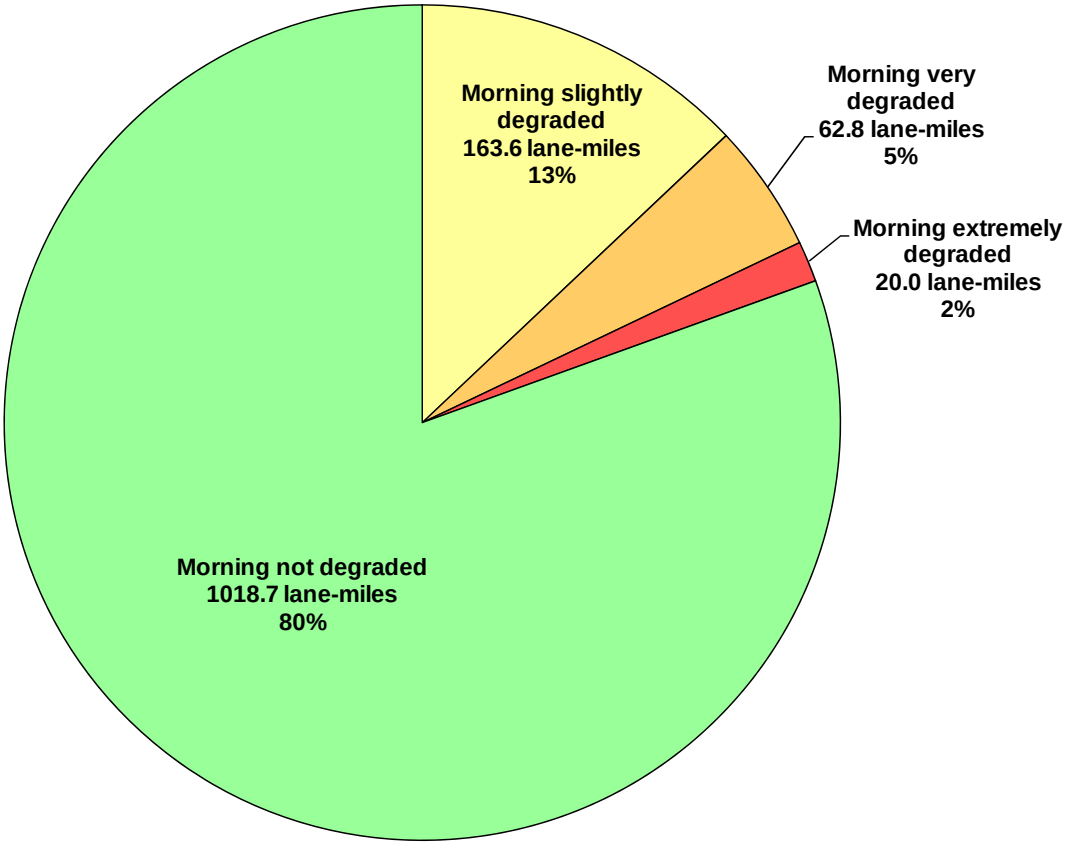
MORNING PEAK HOUR DEGRADED HOV LANE-MILE SUMMARY BY DISTRICT
JANUARY 1 TO JUNE 30, 2011



NOTE: 1265.1 lane-miles total; numbers may not add up due to rounding.

Figure 8

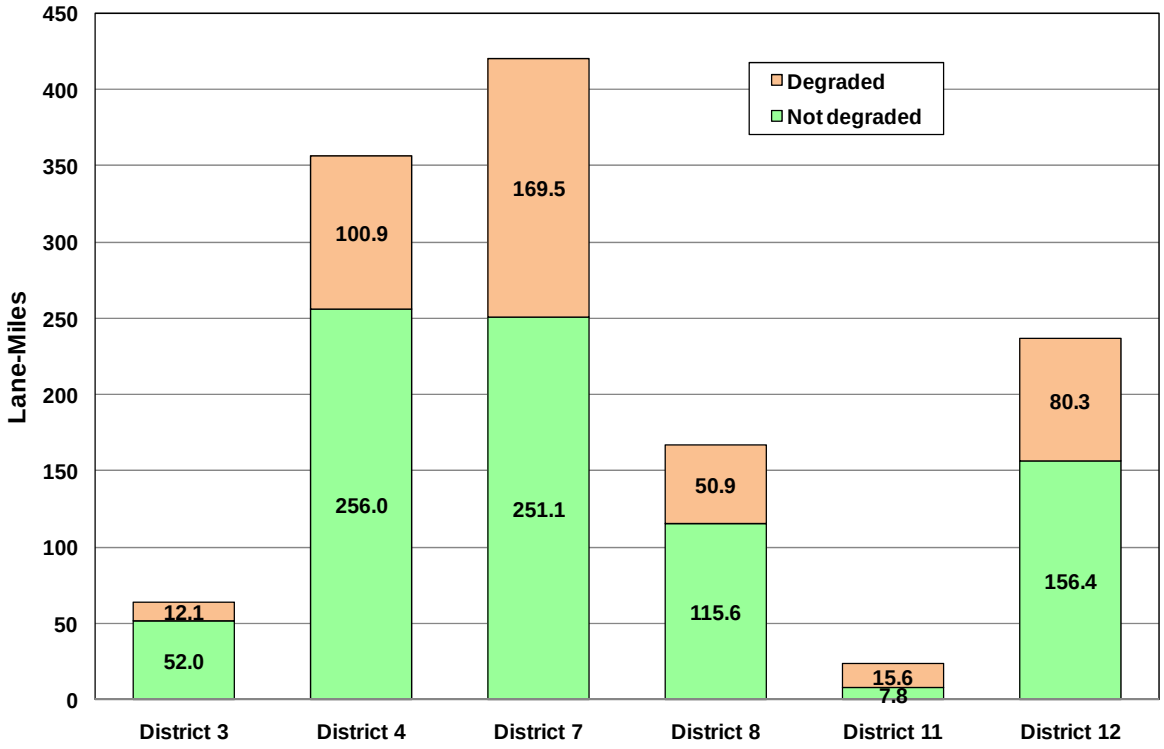
MORNING PEAK HOUR STATEWIDE DEGRADATION SEVERITY
JANUARY 1 TO JUNE 30, 2011



NOTE: 1265.1 lane-miles total; numbers may not add up due to rounding.

Figure 9

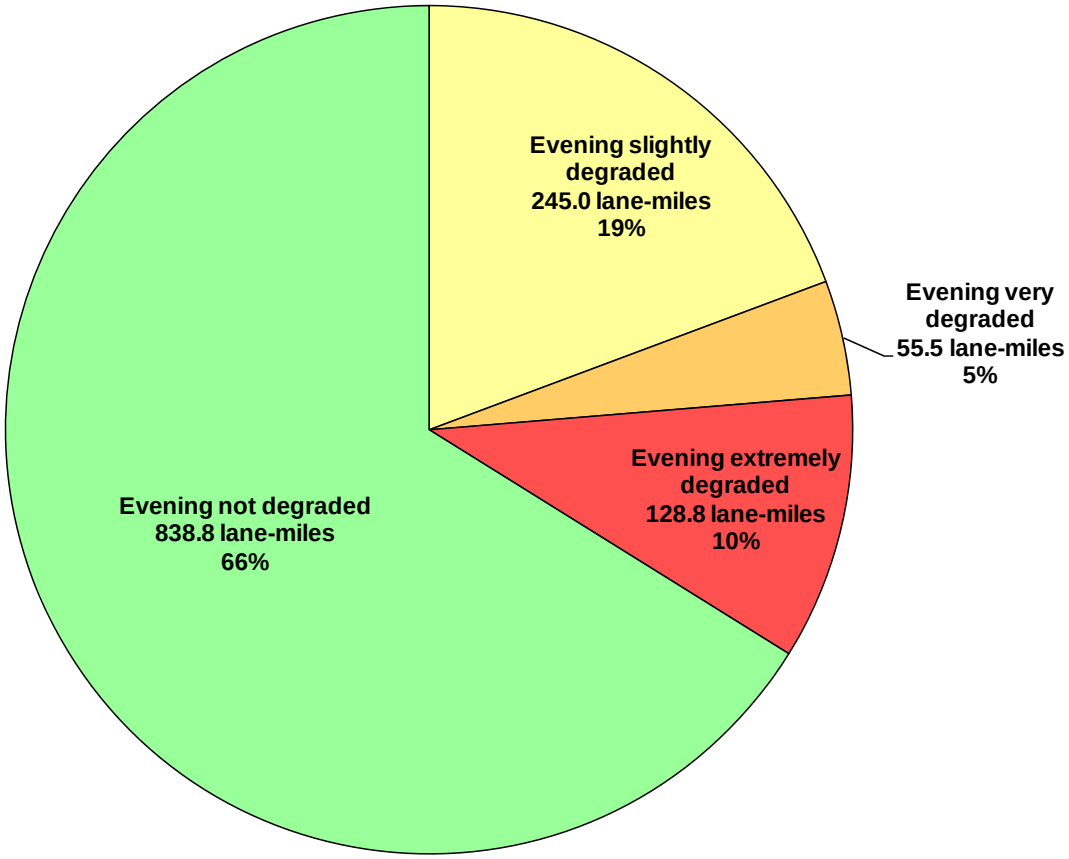
EVENING PEAK HOUR DEGRADED HOV LANE-MILE SUMMARY BY DISTRICT
JANUARY 1 TO JUNE 30, 2011



NOTE: 1268.1 lane-miles total; numbers may not add up due to rounding.

Figure 10

EVENING PEAK HOUR STATEWIDE DEGRADATION SEVERITY
JANUARY 1 TO JUNE 30, 2011



NOTE: 1268.1 lane-miles total; numbers may not add up due to rounding.

Table 2

DEGRADED HOV LANE SEGMENTS
JANUARY 1 TO JUNE 30, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening	
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded
3	50	EB	SAC	12.500	SAC	16.311	3.811	Evening	Not Degraded	0	Slightly Degraded	18
3	80	WB	SAC	18.000	SAC	13.904	4.096	Morning	Slightly Degraded	14	Not Degraded	0
3	99	NB	SAC	11.900	SAC	16.030	4.130	Morning	Slightly Degraded	28	Not Degraded	2
3	99	NB	SAC	16.031	SAC	20.165	4.134	Morning	Slightly Degraded	44	Not Degraded	2
3	99	NB	SAC	20.166	SAC	R24.300	4.134	Morning	Slightly Degraded	35	Not Degraded	3
3	99	SB	SAC	R24.300	SAC	20.167	4.133	Evening	Not Degraded	0	Extremely Degraded	105
3	99	SB	SAC	20.168	SAC	16.034	4.134	Evening	Not Degraded	1	Extremely Degraded	127
4	4	EB	CC	R20.088	CC	24.400	4.288	Evening	Not Degraded	0	Extremely Degraded	125
4	80	EB	ALA	2.500	ALA	6.552	4.052	Morning & Evening	Slightly Degraded	31	Extremely Degraded	128
4	80	WB	CC	2.923	ALA	6.423	4.523	Morning	Slightly Degraded	46	Not Degraded	7
4	80	WB	ALA	6.423	ALA	1.900	4.523	Morning & Evening	Very Degraded	96	Extremely Degraded	124
4	85	SB	SCL	R19.005	SCL	R14.21	4.795	Evening	Not Degraded	0	Slightly Degraded	38
4	101	NB	SCL	R35.534	SCL	40.254	4.724	Morning	Slightly Degraded	27	Not Degraded	0
4	101	NB	SCL	44.978	SCL	49.702	4.724	Morning	Slightly Degraded	18	Not Degraded	4
4	101	NB	SCL	49.702	SM	1.876	4.724	Evening	Not Degraded	2	Slightly Degraded	25
4	101	NB	SM	1.876	SM	6.600	4.724	Evening	Not Degraded	0	Slightly Degraded	13
4	101	NB	MRN	3.800	MRN	8.323	4.523	Evening	Not Degraded	0	Slightly Degraded	60
4	101	SB	SON	21.600	SON	15.200	6.400	Evening	Not Degraded	0	Slightly Degraded	52
4	101	SB	MRN	18.900	MRN	12.846	6.054	Morning	Slightly Degraded	33	Not Degraded	0
4	101	SB	SM	6.600	SM	1.876	4.724	Morning & Evening	Slightly Degraded	54	Slightly Degraded	45
4	101	SB	SM	1.876	SCL	49.702	4.724	Evening	Not Degraded	0	Extremely Degraded	98
4	101	SB	SCL	44.978	SCL	40.254	4.724	Evening	Not Degraded	0	Very Degraded	84
4	101	SB	SCL	40.254	SCL	R35.534	4.724	Evening	Not Degraded	0	Slightly Degraded	60
4	101	SB	SCL	R35.534	SCL	30.810	4.724	Morning & Evening	Slightly Degraded	30	Slightly Degraded	62
4	101	SB	SCL	30.810	SCL	R26.448	4.724	Morning & Evening	Slightly Degraded	23	Slightly Degraded	53
4	101	SB	SCL	R21.724	SCL	R17.000	4.724	Evening	Not Degraded	2	Slightly Degraded	19
4	237	EB	SCL	3.000	SCL	R6.241	3.241	Evening	Not Degraded	0	Slightly Degraded	20
4	280	NB	SCL	10.439	SCL	14.000	3.561	Morning	Very Degraded	68	Not Degraded	0
4	580	EB	ALA	13.2	ALA	10.485	2.715	Evening	Not Degraded	0	Slightly Degraded	15
4	580	EB	ALA	10.485	ALA	R7.800	2.714	Evening	Not Degraded	0	Very Degraded	79
4	680	NB	ALA	R21.6	CC	R3.898	4.177	Morning	Slightly Degraded	13	Not Degraded	3

Table 2

DEGRADED HOV LANE SEGMENTS
JANUARY 1 TO JUNE 30, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening	
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded
(Continued from page 10)												
4	680	NB	CC	R3.898	CC	R8.100	4.177	Evening	Not Degraded	9	Slightly Degraded	41
4	680	SB	CC	R18.579	CC	16.300	2.279	Morning	Slightly Degraded	22	Not Degraded	1
4	880	NB	SCL	8.700	ALA	3.089	4.616	Evening	Not Degraded	0	Slightly Degraded	43
4	880	NB	ALA	7.705	ALA	12.321	4.616	Evening	Not Degraded	3	Slightly Degraded	59
4	880	NB	ALA	12.321	ALA	19.300	6.979	Evening	Not Degraded	0	Very Degraded	97
4	880	NB	ALA	R34.700	ALA	R35.400	0.700	Evening	Not Degraded	0	Very Degraded	78
4	880	SB	ALA	22.700	ALA	17.855	4.845	Morning	Slightly Degraded	16	Not Degraded	11
4	880	SB	ALA	17.855	ALA	13.009	4.846	Morning	Slightly Degraded	17	Not Degraded	9
7	5	NB	LA	39.400	LA	42.389	2.989	Morning & Evening	Very Degraded	78	Extremely Degraded	129
7	5	NB	LA	42.389	LA	R45.600	2.988	Morning & Evening	Very Degraded	67	Extremely Degraded	129
7	5	SB	LA	R45.600	LA	42.389	2.988	Morning & Evening	Very Degraded	78	Extremely Degraded	129
7	5	SB	LA	42.389	LA	39.400	2.989	Morning & Evening	Very Degraded	78	Extremely Degraded	129
7	10	EB	LA	25.464	LA	31.200	5.736	Evening	Not Degraded	0	Extremely Degraded	129
7	10	EB	LA	42.400	LA	45.330	2.930	Evening	Not Degraded	1	Slightly Degraded	29
7	10	WB	LA	20.904	LA	17.000	4.559	Morning	Slightly Degraded	35	Not Degraded	2
7	14	NB	LA	R24.800	LA	R29.281	4.481	Evening	Not Degraded	0	Slightly Degraded	15
7	14	NB	LA	42.775	LA	R47.256	4.481	Evening	Not Degraded	0	Slightly Degraded	16
7	57	NB	LA	R0.000	LA	R4.500	4.500	Evening	Not Degraded	8	Very Degraded	71
7	57	SB	LA	R4.500	LA	R0.000	4.500	Evening	Not Degraded	2	Slightly Degraded	49
7	91	EB	LA	R6.400	LA	R11.167	4.767	Evening	Not Degraded	0	Extremely Degraded	117
7	91	EB	LA	R11.167	LA	R15.933	4.766	Evening	Not Degraded	1	Very Degraded	90
7	91	EB	LA	R15.933	LA	R20.700	4.767	Evening	Not Degraded	3	Slightly Degraded	30
7	91	WB	LA	R15.933	LA	R11.167	4.766	Morning	Extremely Degraded	104	Not Degraded	0
7	105	EB	LA	R2.200	LA	R6.173	3.973	Evening	Not Degraded	0	Very Degraded	96
7	105	EB	LA	R6.173	LA	R10.145	3.972	Evening	Not Degraded	0	Extremely Degraded	113
7	105	EB	LA	R10.145	LA	R14.117	3.972	Evening	Not Degraded	0	Slightly Degraded	40
7	105	WB	LA	R14.117	LA	R10.145	3.972	Morning	Slightly Degraded	37	Not Degraded	0
7	105	WB	LA	R10.145	LA	R6.172	3.973	Morning	Very Degraded	94	Not Degraded	0
7	110	NB	LA	16.933	LA	20.500	3.567	Morning	Slightly Degraded	20	Not Degraded	0
7	110	SB	LA	13.367	LA	9.800	3.567	Evening	Not Degraded	10	Slightly Degraded	20

Table 2

DEGRADED HOV LANE SEGMENTS
JANUARY 1 TO JUNE 30, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening	
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded
(Continued from page 11)												
7	118	EB	LA	R3.800	LA	R7.600	3.800	Morning & Evening	Slightly Degraded	32	Slightly Degraded	49
7	118	EB	LA	R7.600	LA	R11.400	3.800	Morning & Evening	Slightly Degraded	56	Slightly Degraded	14
7	118	WB	LA	R11.400	LA	R7.600	3.800	Morning & Evening	Extremely Degraded	129	Extremely Degraded	129
7	170	NB	LA	R17.505	LA	R20.510	3.005	Evening	Not Degraded	6	Extremely Degraded	129
7	170	SB	LA	R17.505	LA	R14.500	3.005	Morning	Very Degraded	64	Not Degraded	0
7	210	EB	LA	R25.000	LA	L29.568	4.568	Evening	Not Degraded	0	Very Degraded	85
7	210	EB	LA	L29.568	LA	R33.827	4.568	Evening	Not Degraded	1	Extremely Degraded	111
7	210	EB	LA	R33.827	LA	R38.396	4.569	Evening	Not Degraded	2	Extremely Degraded	121
7	210	EB	LA	R38.396	LA	R42.964	4.568	Evening	Not Degraded	1	Slightly Degraded	36
7	210	EB	LA	R42.964	LA	R47.532	4.568	Evening	Not Degraded	0	Very Degraded	71
7	210	EB	LA	R47.532	LA	R52.100	4.568	Morning & Evening	Extremely Degraded	121	Slightly Degraded	45
7	210	WB	LA	R38.395	LA	R33.827	4.568	Morning & Evening	Very Degraded	94	Slightly Degraded	14
7	210	WB	LA	R33.827	LA	L29.568	4.568	Morning & Evening	Very Degraded	95	Slightly Degraded	24
7	210	WB	LA	L29.568	LA	R25.000	4.568	Evening	Not Degraded	9	Slightly Degraded	16
7	405	NB	LA	4.842	LA	9.861	4.843	Morning	Slightly Degraded	16	Not Degraded	0
7	405	NB	LA	9.861	LA	14.703	4.842	Morning & Evening	Very Degraded	81	Very Degraded	77
7	405	NB	LA	14.703	LA	19.546	4.843	Morning	Very Degraded	85	Not Degraded	2
7	405	NB	LA	19.546	LA	24.388	4.842	Morning	Slightly Degraded	39	Not Degraded	0
7	405	NB	LA	24.388	LA	26.400	2.012	Morning	Extremely Degraded	114	Not Degraded	7
7	405	SB	LA	43.758	LA	38.915	4.843	Morning	Extremely Degraded	115	Not Degraded	0
7	405	SB	LA	38.915	LA	34.073	4.842	Morning	Very Degraded	69	Not Degraded	0
7	405	SB	LA	24.388	LA	19.546	4.842	Evening	Not Degraded	0	Slightly Degraded	41
7	405	SB	LA	19.546	LA	14.703	4.843	Evening	Not Degraded	10	Very Degraded	71
7	405	SB	LA	14.703	LA	9.861	4.842	Evening	Not Degraded	0	Very Degraded	94
7	405	SB	LA	9.861	LA	4.842	4.843	Evening	Not Degraded	0	Extremely Degraded	104
7	405	SB	LA	4.842	LA	0.000	4.842	Evening	Not Degraded	0	Extremely Degraded	122
7	605	NB	LA	R8.280	LA	R12.420	4.140	Evening	Not Degraded	1	Slightly Degraded	28
7	605	NB	LA	R12.420	LA	R16.560	4.140	Evening	Not Degraded	0	Slightly Degraded	37
7	605	SB	LA	R16.560	LA	R12.420	4.140	Evening	Not Degraded	3	Slightly Degraded	16
7	605	SB	LA	R12.420	LA	R8.280	4.140	Evening	Not Degraded	2	Slightly Degraded	35

Table 2

DEGRADED HOV LANE SEGMENTS
JANUARY 1 TO JUNE 30, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening	
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded
(Continued from page 12)												
8	10	EB	SBD	4.950	SBD	9.900	4.950	Evening	Not Degraded	0	Slightly Degraded	17
8	10	WB	SBD	9.900	SBD	4.950	4.950	Evening	Not Degraded	12	Slightly Degraded	37
8	60	EB	SBD	R0.000	SBD	R4.987	4.987	Evening	Not Degraded	0	Slightly Degraded	41
8	60	EB	RIV	10.266	RIV	15.413	4.988	Evening	Not Degraded	1	Slightly Degraded	39
8	60	EB	RIV	15.413	RIV	20.400	4.987	Evening	Not Degraded	0	Extremely Degraded	101
8	91	EB	RIV	R0.000	RIV	4.266	4.378	Evening	Not Degraded	0	Extremely Degraded	116
8	91	EB	RIV	4.266	RIV	8.644	4.378	Evening	Not Degraded	3	Extremely Degraded	105
8	91	EB	RIV	13.022	RIV	17.400	4.378	Morning	Very Degraded	74	Not Degraded	3
8	91	WB	RIV	8.644	RIV	4.266	4.378	Morning & Evening	Very Degraded	96	Slightly Degraded	55
8	210	EB	SBD	0.000	SBD	4.933	4.933	Evening	Not Degraded	0	Slightly Degraded	21
8	215	NB	RIV	R38.300	RIV	40.646	2.653	Morning & Evening	Very Degraded	68	Very Degraded	73
8	215	SB	RIV	43.300	RIV	40.646	2.654	Evening	Not Degraded	0	Extremely Degraded	127
8	215	SB	RIV	40.646	RIV	R38.300	2.653	Evening	Not Degraded	0	Slightly Degraded	24
11	5	NB	SD	R30.700	SD	R34.600	3.900	Evening	Not Degraded	0	Slightly Degraded	51
11	5	NB	SD	R34.600	SD	R38.500	3.900	Evening	Not Degraded	0	Very Degraded	76
11	5	SB	SD	R38.500	SD	R34.616	3.884	Morning	Slightly Degraded	20	Not Degraded	0
11	15	NB	SD	M12.000	SD	M15.900	3.900	Evening	Not Degraded	0	Slightly Degraded	44
11	15	NB	SD	M15.900	SD	M19.800	3.900	Evening	Not Degraded	0	Slightly Degraded	22
12	5	NB	ORA	20.497	ORA	R25.097	4.600	Morning & Evening	Slightly Degraded	38	Slightly Degraded	51
12	5	NB	ORA	R25.097	ORA	29.703	4.599	Morning & Evening	Slightly Degraded	35	Extremely Degraded	101
12	5	NB	ORA	29.703	ORA	34.302	4.599	Evening	Not Degraded	0	Extremely Degraded	117
12	5	SB	ORA	38.901	ORA	34.302	4.599	Morning	Slightly Degraded	62	Not Degraded	6
12	5	SB	ORA	34.302	ORA	29.703	4.599	Morning & Evening	Slightly Degraded	38	Slightly Degraded	20
12	5	SB	ORA	15.898	ORA	11.299	4.599	Morning & Evening	Slightly Degraded	31	Slightly Degraded	28
12	5	SB	ORA	11.299	ORA	6.700	4.599	Morning & Evening	Slightly Degraded	13	Slightly Degraded	15
12	22	EB	ORA	R4.368	ORA	R8.036	3.668	Morning	Slightly Degraded	15	Not Degraded	4
12	22	WB	ORA	R4.368	ORA	R0.700	3.668	Evening	Not Degraded	4	Slightly Degraded	22
12	55	NB	ORA	R6.000	ORA	R9.761	3.761	Evening	Not Degraded	0	Extremely Degraded	116
12	55	SB	ORA	17.300	ORA	13.539	3.761	Morning	Very Degraded	65	Not Degraded	2
12	55	SB	ORA	13.539	ORA	R9.761	3.760	Morning	Slightly Degraded	42	Not Degraded	6

Table 2

DEGRADED HOV LANE SEGMENTS
JANUARY 1 TO JUNE 30, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening	
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded
(Continued from page 13)												
12	57	NB	ORA	10.800	ORA	14.700	3.900	Evening	Not Degraded	8	Slightly Degraded	14
12	57	NB	ORA	14.700	ORA	18.600	3.900	Morning & Evening	Slightly Degraded	40	Slightly Degraded	59
12	57	NB	ORA	18.600	ORA	R22.500	3.900	Evening	Not Degraded	0	Very Degraded	89
12	57	SB	ORA	18.600	ORA	14.700	3.900	Morning	Slightly Degraded	23	Not Degraded	7
12	57	SB	ORA	14.700	ORA	10.800	3.900	Morning	Slightly Degraded	31	Not Degraded	6
12	91	WB	ORA	0.841	ORA	R0.000	4.515	Evening	Not Degraded	7	Slightly Degraded	28
12	405	NB	ORA	5.08	ORA	9.929	4.849	Evening	Not Degraded	0	Slightly Degraded	44
12	405	NB	ORA	9.929	ORA	14.779	4.850	Evening	Not Degraded	0	Extremely Degraded	104
12	405	NB	ORA	14.779	ORA	19.628	4.849	Evening	Not Degraded	11	Slightly Degraded	49
12	405	NB	ORA	19.628	LA	0.300	4.850	Evening	Not Degraded	2	Slightly Degraded	13
12	405	SB	LA	0.300	ORA	19.628	4.850	Morning & Evening	Slightly Degraded	43	Extremely Degraded	110
12	405	SB	ORA	19.628	ORA	14.779	4.849	Morning	Slightly Degraded	23	Not Degraded	3
12	405	SB	ORA	9.929	ORA	5.080	4.849	Evening	Not Degraded	8	Extremely Degraded	110
						Total	572.249					

3. ANALYSIS RESULTS—JULY TO DECEMBER 2011

During the second half of 2011, approximately 49 percent (656 of 1326 lane-miles) of all monitored HOV lane segments were degraded and 51 percent (670 lane-miles) were not degraded. As shown in Figure 11, approximately 11 percent (153 of 1326 lane-miles) of the total monitored HOV lane segments were degraded only during the morning peak hour period, 27 percent (362 lane-miles) were degraded only during the evening peak hour period, and 11 percent (141 lane-miles) were degraded during both the morning and evening peak hour periods.

Figure 12 provides a summary of degradation by district; District 7 had the most degradation, with approximately 40 percent of all degraded segments (260 of 1326 lane-miles).

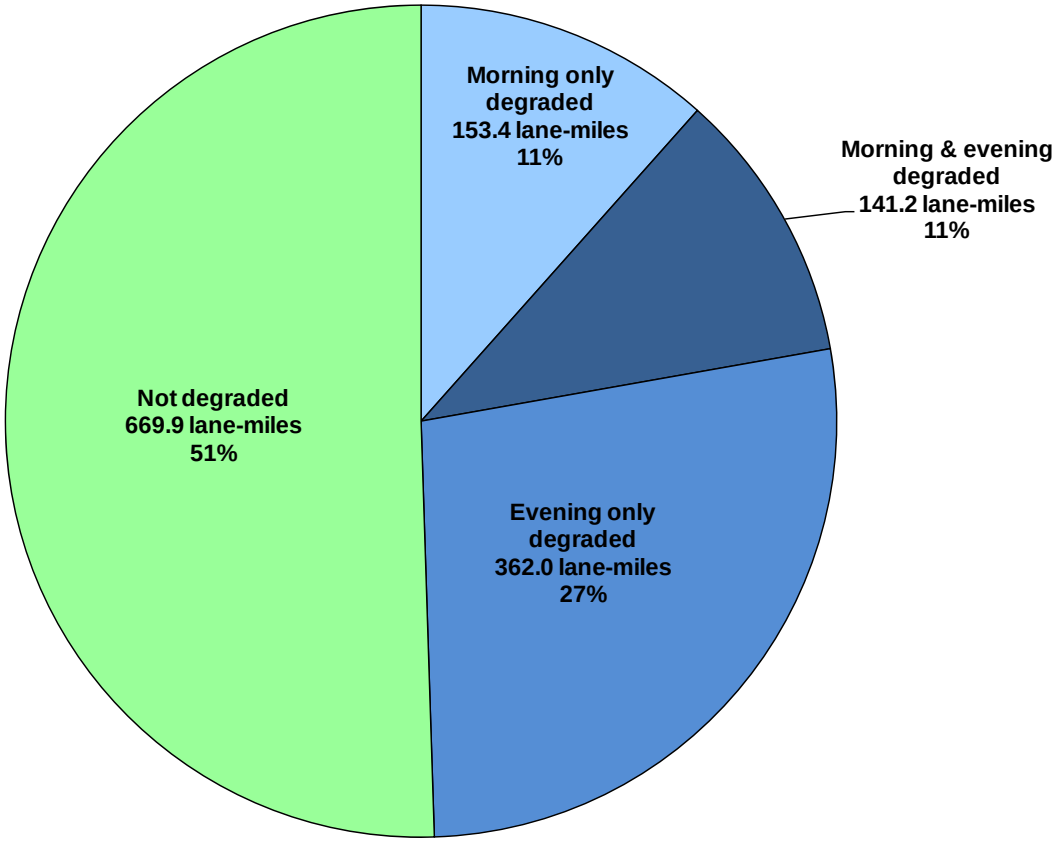
Figure 13 shows the number of degraded lane-miles in each district during the morning peak hour period. Figure 14 shows the frequency of degradation on all monitored segments that were operating during the morning peak hour period. Approximately 23 percent (295 of 1265 lane-miles) were degraded; 1 percent (18 lane-miles) were categorized as extremely degraded, another 3 percent (42 lane-miles) were categorized as very degraded and 19 percent (235 lane-miles) were slightly degraded.

Figure 15 shows the number of degraded lane-miles in each district during the morning peak hour period. The frequency of degradation on all monitored segments that were during the evening peak hour period is shown in Figure 16. As with the first half of the year, degradation was more prevalent and more frequent in the evening peak hour. Approximately 40 percent (503 of 1268 lane-miles) of the monitored segments operating during this time were degraded; 9 percent (115 lane-miles) were considered extremely degraded, 6 percent (75 lane-miles) were categorized as very degraded, and 25 percent (314 lane-miles) were slightly degraded.

Table 3 shows the locations of degraded HOV lane segments for the second six-month period of 2011, including the peak period(s) where degradation was observed, the number of days it was observed, and the degradation category. Note that many segments identified as degraded during the second half of the year were also degraded during the first half of the year. The degradation category did not change for most of these segments.

Figure 11

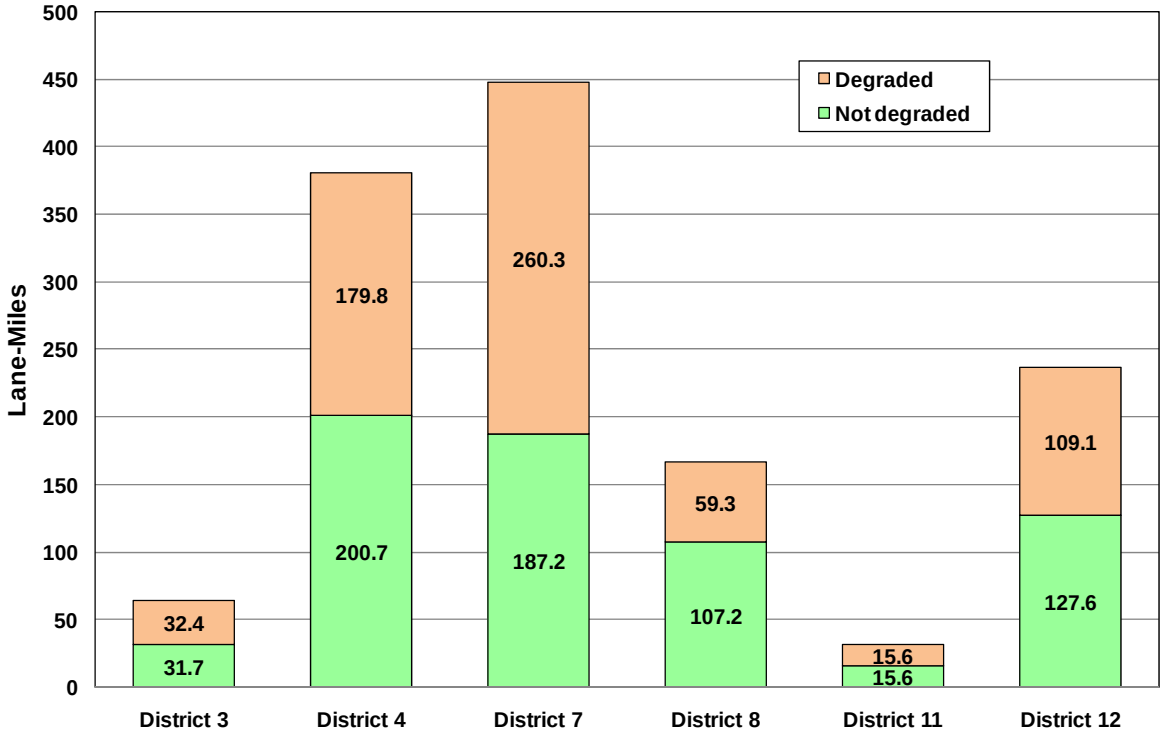
STATEWIDE DEGRADATION SUMMARY BY PEAK HOUR
JULY 1 TO DECEMBER 31, 2011



NOTE: 1326.5 lane-miles total; numbers may not add up due to rounding.

Figure 12

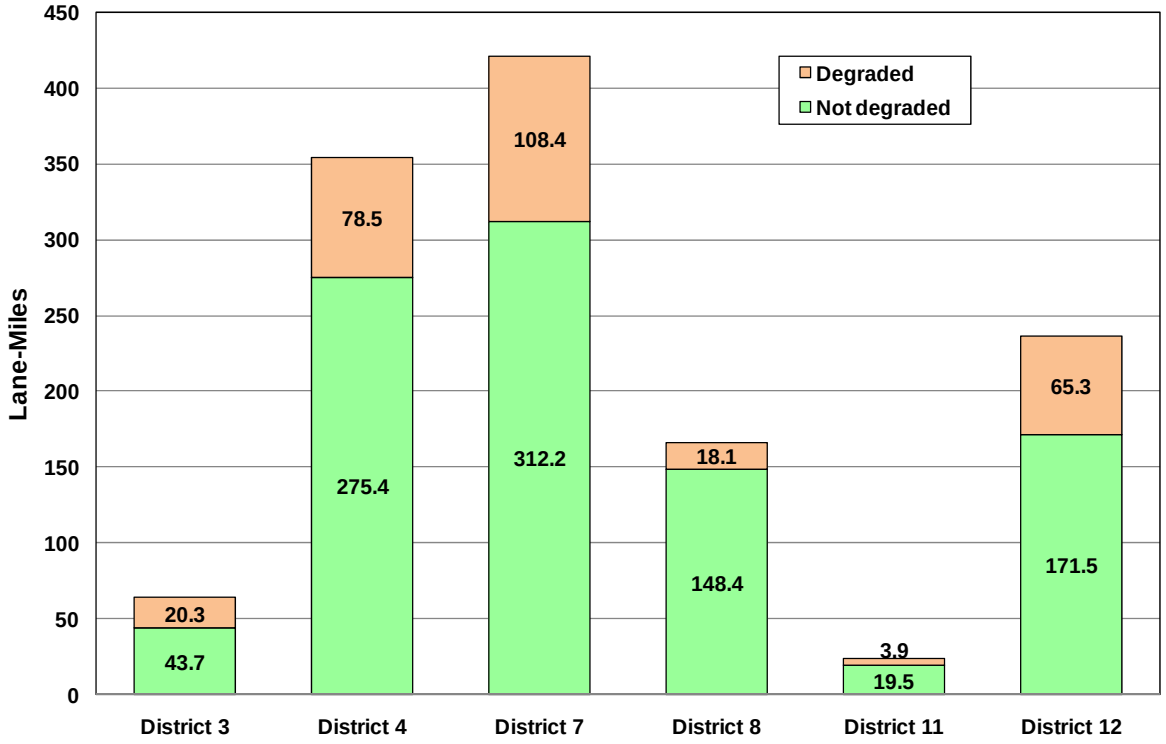
STATEWIDE DEGRADED HOV LANE-MILE SUMMARY BY DISTRICT
JULY 1 TO DECEMBER 31, 2011



NOTE: 1326.5 lane-miles total; numbers may not add up due to rounding.

Figure 13

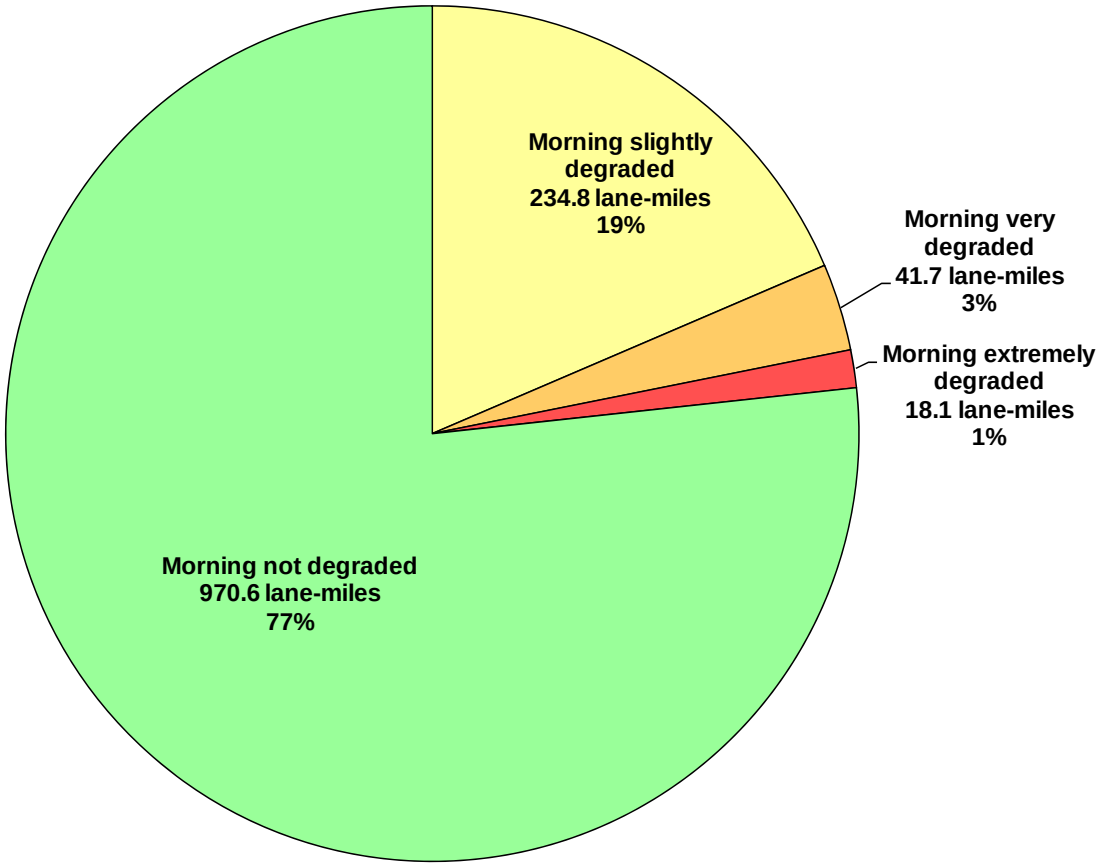
MORNING PEAK HOUR DEGRADED HOV LANE-MILE SUMMARY BY DISTRICT
JULY 1 TO DECEMBER 31, 2011



NOTE: 1265.1 lane-miles total; numbers may not add up due to rounding.

Figure 14

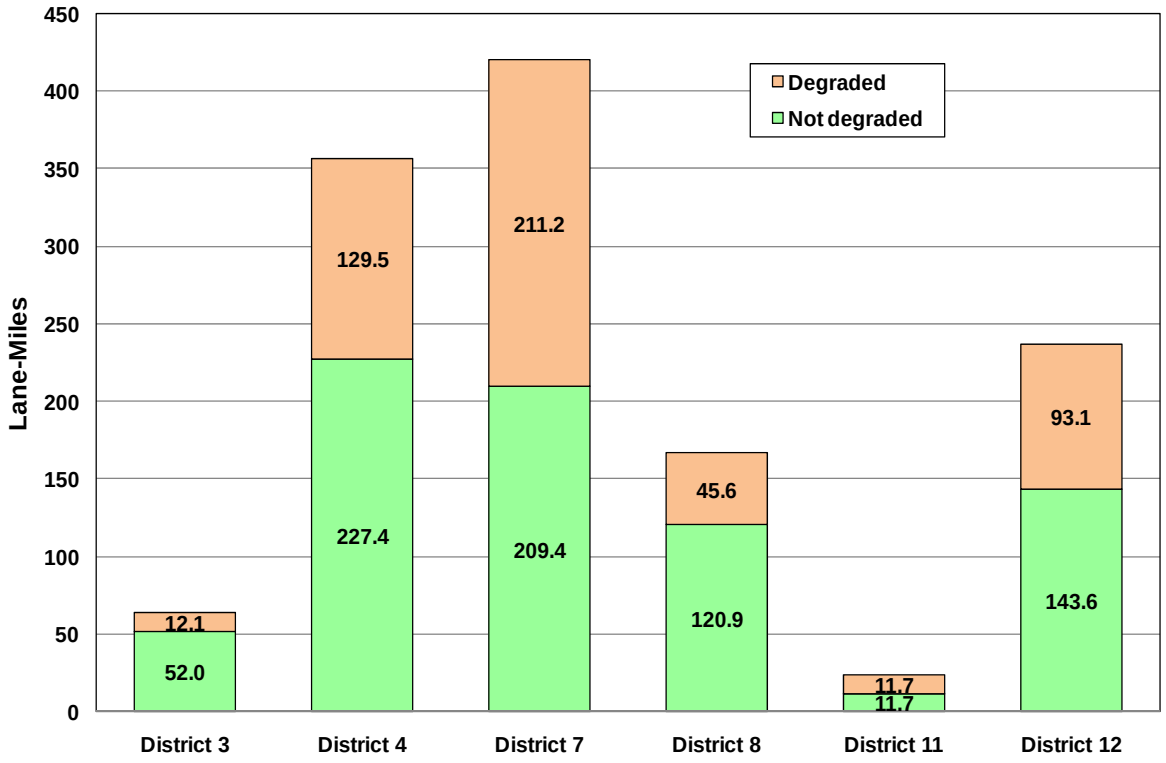
MORNING PEAK HOUR STATEWIDE DEGRADATION SEVERITY
JULY 1 TO DECEMBER 31, 2011



NOTE: 1265.1 lane-miles total; numbers may not add up due to rounding.

Figure 15

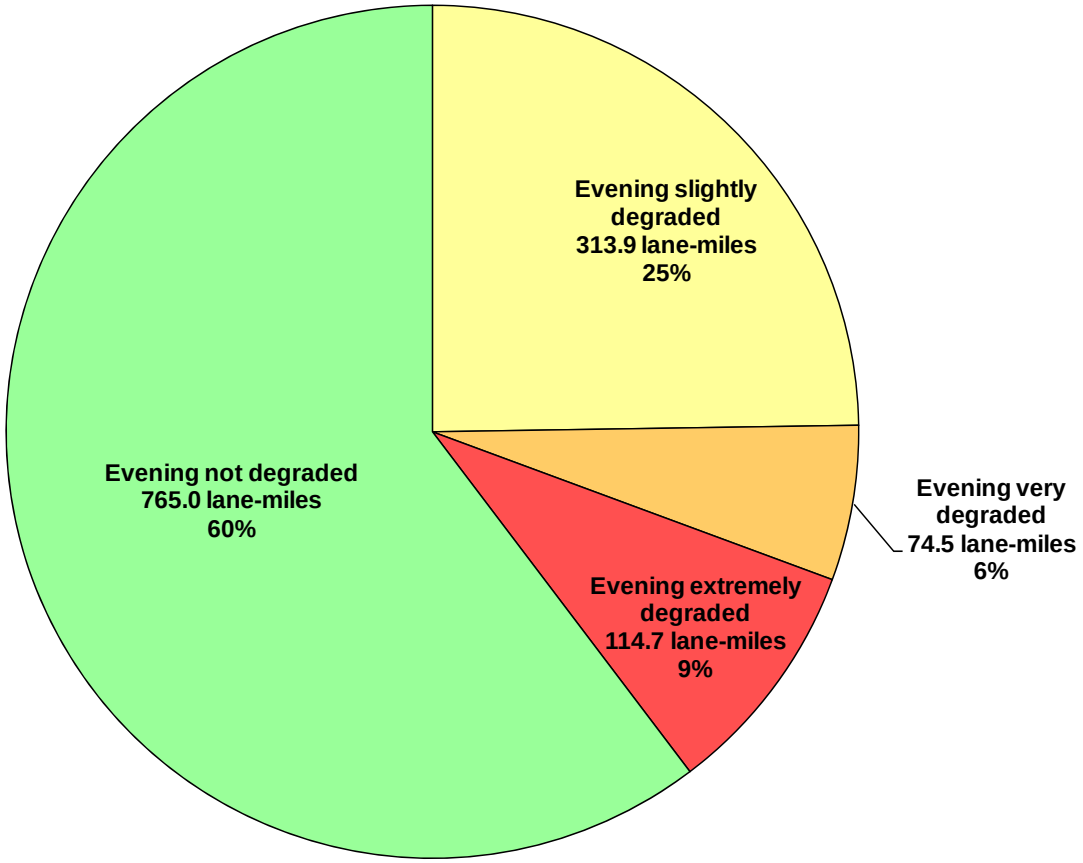
EVENING PEAK HOUR DEGRADED HOV LANE-MILE SUMMARY BY DISTRICT
JULY 1 TO DECEMBER 31, 2011



NOTE: 1268.1 lane-miles total; numbers may not add up due to rounding.

Figure 16

EVENING PEAK HOUR STATEWIDE DEGRADATION SEVERITY
JULY 1 TO DECEMBER 31, 2011



NOTE: 1268.1 lane-miles total; numbers may not add up due to rounding.

Table 3

DEGRADED HOV LANE SEGMENTS
JULY 1 TO DECEMBER 31, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening		Peak Hour Degraded Jan–Jun 2011
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded	
3	50	EB	SAC	12.500	SAC	16.311	3.811	Evening	Not Degraded	0	Slightly Degraded	19	Evening
3	50	WB	SAC	16.312	SAC	12.500	3.812	Morning	Slightly Degraded	24	Not Degraded	1	Not Degraded
3	80	WB	SAC	18.000	SAC	13.904	4.096	Morning	Slightly Degraded	18	Not Degraded	0	Morning
3	99	NB	SAC	11.900	SAC	16.031	4.131	Morning	Slightly Degraded	36	Not Degraded	0	Morning
3	99	NB	SAC	16.031	SAC	20.165	4.134	Morning	Slightly Degraded	44	Not Degraded	0	Morning
3	99	NB	SAC	20.166	SAC	R24.300	4.134	Morning	Slightly Degraded	47	Not Degraded	1	Morning
3	99	SB	SAC	R24.300	SAC	20.167	4.133	Evening	Not Degraded	0	Very Degraded	66	Evening
3	99	SB	SAC	20.168	SAC	16.034	4.134	Evening	Not Degraded	1	Extremely Degraded	124	Evening
4	4	EB	CC	R20.088	CC	24.400	4.288	Evening	Not Degraded	0	Extremely Degraded	124	Evening
4	80	EB	ALA	2.500	ALA	6.552	4.052	Evening	Not Degraded	3	Extremely Degraded	130	Morning & Evening
4	80	EB	CC	2.582	CC	6.634	4.052	Evening	Not Degraded	1	Slightly Degraded	31	Not Degraded
4	80	WB	CC	2.923	ALA	6.423	4.523	Morning & Evening	Slightly Degraded	50	Slightly Degraded	17	Morning
4	80	WB	ALA	6.423	ALA	1.9	4.523	Morning & Evening	Slightly Degraded	30	Extremely Degraded	125	Morning & Evening
4	85	NB	SCL	4.795	SCL	9.59	4.795	Morning	Slightly Degraded	23	Not Degraded	0	Not Degraded
4	85	NB	SCL	9.59	SCL	R14.21	4.796	Morning	Slightly Degraded	24	Not Degraded	1	Not Degraded
4	85	SB	SCL	R19.005	SCL	R14.21	4.795	Evening	Not Degraded	0	Slightly Degraded	44	Evening
4	87	NB	SCL	3.748	SCL	7.297	3.549	Morning	Slightly Degraded	45	Not Degraded	1	Not Degraded
4	101	NB	SCL	30.810	SCL	R35.534	4.724	Morning	Slightly Degraded	17	Not Degraded	1	Not Degraded
4	101	NB	SCL	R35.534	SCL	40.254	4.724	Morning	Slightly Degraded	33	Not Degraded	0	Morning
4	101	NB	SM	1.876	SM	6.600	4.724	Evening	Not Degraded	0	Slightly Degraded	17	Evening
4	101	NB	MRN	3.800	MRN	8.323	4.523	Evening	Not Degraded	0	Extremely Degraded	103	Evening
4	101	SB	SON	21.600	SON	15.200	6.400	Evening	Not Degraded	1	Slightly Degraded	41	Evening
4	101	SB	MRN	18.900	MRN	12.846	6.054	Morning	Very Degraded	68	Not Degraded	0	Morning
4	101	SB	SM	6.600	SM	1.876	4.724	Morning & Evening	Very Degraded	89	Slightly Degraded	37	Morning & Evening
4	101	SB	SM	1.876	SCL	49.702	4.724	Evening	Not Degraded	0	Extremely Degraded	113	Evening
4	101	SB	SCL	44.978	SCL	40.254	4.724	Evening	Not Degraded	0	Very Degraded	77	Evening
4	101	SB	SCL	40.254	SCL	R35.534	4.724	Evening	Not Degraded	0	Slightly Degraded	46	Evening
4	101	SB	SCL	R35.534	SCL	30.810	4.724	Morning & Evening	Slightly Degraded	36	Slightly Degraded	54	Morning & Evening
4	101	SB	SCL	30.810	SCL	R26.448	4.724	Evening	Not Degraded	9	Slightly Degraded	32	Morning & Evening
4	101	SB	SCL	R21.724	SCL	R17.000	4.724	Evening	Not Degraded	0	Slightly Degraded	26	Evening
4	237	EB	SCL	3.000	SCL	R6.241	3.241	Evening	Not Degraded	2	Slightly Degraded	19	Evening

Table 3

DEGRADED HOV LANE SEGMENTS
JULY 1 TO DECEMBER 31, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening		Peak Hour Degraded Jan–Jun 2011
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded	
(Continued from page 22)													
4	237	EB	SCL	R6.241	SCL	9.500	3.241	Evening	Not Degraded	0	Slightly Degraded	25	Not Degraded
4	237	WB	SCL	9.500	SCL	R6.265	3.266	Morning	Slightly Degraded	18	Not Degraded	6	Not Degraded
4	280	NB	SCL	L4.700	SCL	6.879	3.561	Morning	Slightly Degraded	15	Not Degraded	0	Not Degraded
4	280	NB	SCL	10.439	SCL	14.000	3.561	Morning	Slightly Degraded	43	Not Degraded	0	Morning
4	280	SB	SCL	10.439	SCL	6.879	3.560	Evening	Not Degraded	1	Slightly Degraded	22	Not Degraded
4	280	SB	SCL	6.879	SCL	L4.700	3.561	Evening	Not Degraded	0	Slightly Degraded	14	Not Degraded
4	580	EB	ALA	13.200	ALA	10.485	2.715	Evening	Not Degraded	0	Slightly Degraded	26	Evening
4	580	EB	ALA	10.485	ALA	R7.800	2.714	Evening	Not Degraded	1	Extremely Degraded	109	Evening
4	680	NB	ALA	R21.600	CC	R3.898	4.177	Morning	Slightly Degraded	19	Not Degraded	5	Morning
4	680	NB	CC	R3.898	CC	R8.100	4.177	Evening	Not Degraded	11	Slightly Degraded	44	Evening
4	680	SB	ALA	M2.385	SCL	M7.600	4.720	Evening	Not Degraded	0	Slightly Degraded	31	Not Degraded
4	680	SB	CC	R18.579	CC	16.300	2.279	Morning	Slightly Degraded	48	Not Degraded	6	Morning
4	880	NB	SCL	8.700	ALA	3.089	4.616	Evening	Not Degraded	0	Slightly Degraded	52	Evening
4	880	NB	ALA	7.705	ALA	12.321	4.616	Evening	Not Degraded	2	Very Degraded	66	Evening
4	880	NB	ALA	12.321	ALA	19.300	6.979	Evening	Not Degraded	0	Extremely Degraded	113	Evening
4	880	NB	ALA	R34.700	ALA	R35.400	0.700	Evening	Not Degraded	1	Slightly Degraded	60	Evening
4	880	SB	ALA	22.700	ALA	17.855	4.845	Morning & Evening	Slightly Degraded	32	Slightly Degraded	15	Morning
4	880	SB	ALA	17.855	ALA	13.009	4.846	Morning & Evening	Slightly Degraded	31	Slightly Degraded	22	Morning
4	880	SB	ALA	13.009	ALA	8.164	4.845	Morning	Slightly Degraded	23	Not Degraded	0	Not Degraded
7	5	NB	LA	39.400	LA	42.389	2.989	Morning & Evening	Slightly Degraded	34	Slightly Degraded	65	Morning & Evening
7	5	NB	LA	42.389	LA	R45.600	2.988	Evening	Not Degraded	11	Very Degraded	80	Morning & Evening
7	5	SB	LA	R45.600	LA	42.389	2.988	Morning & Evening	Slightly Degraded	41	Very Degraded	71	Morning & Evening
7	5	SB	LA	42.389	LA	39.400	2.989	Morning & Evening	Slightly Degraded	26	Slightly Degraded	29	Morning & Evening
7	10	EB	LA	17.000	LA	20.904	4.559	Evening	Not Degraded	0	Slightly Degraded	18	Not Degraded
7	10	EB	LA	25.464	LA	31.200	5.736	Evening	Not Degraded	0	Extremely Degraded	131	Evening
7	10	EB	LA	42.400	LA	45.330	2.930	Evening	Not Degraded	0	Slightly Degraded	25	Evening
7	10	WB	LA	20.904	LA	17.000	4.559	Morning	Slightly Degraded	17	Not Degraded	0	Morning
7	14	NB	LA	R24.800	LA	R29.281	4.481	Evening	Not Degraded	0	Slightly Degraded	14	Evening
7	57	NB	LA	R0.000	LA	R4.500	4.500	Evening	Not Degraded	11	Very Degraded	85	Evening
7	57	SB	LA	R4.500	LA	R0.000	4.500	Evening	Not Degraded	0	Slightly Degraded	44	Evening

Table 3

DEGRADED HOV LANE SEGMENTS
JULY 1 TO DECEMBER 31, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening		Peak Hour Degraded Jan–Jun 2011
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded	
(Continued from page 23)													
7	91	EB	LA	R6.400	LA	R11.167	4.767	Evening	Not Degraded	0	Extremely Degraded	104	Evening
7	91	EB	LA	R11.167	LA	R15.933	4.766	Evening	Not Degraded	0	Extremely Degraded	108	Evening
7	91	EB	LA	R15.933	LA	R20.700	4.767	Evening	Not Degraded	0	Slightly Degraded	41	Evening
7	91	WB	LA	R20.700	LA	R15.933	4.767	Morning	Slightly Degraded	14	Not Degraded	6	Not Degraded
7	91	WB	LA	R15.933	LA	R11.167	4.766	Morning	Slightly Degraded	43	Not Degraded	0	Morning
7	105	EB	LA	R2.200	LA	R6.173	3.973	Evening	Not Degraded	0	Extremely Degraded	109	Evening
7	105	EB	LA	R6.173	LA	R10.145	3.972	Morning & Evening	Slightly Degraded	28	Extremely Degraded	117	Evening
7	105	EB	LA	R10.145	LA	R14.117	3.972	Evening	Not Degraded	0	Slightly Degraded	60	Evening
7	105	EB	LA	R14.117	LA	R18.09	3.973	Evening	Not Degraded	0	Slightly Degraded	64	Not Degraded
7	105	WB	LA	R10.145	LA	R6.172	3.973	Morning	Very Degraded	93	Not Degraded	2	Morning
7	118	EB	LA	R3.800	LA	R7.600	3.800	Morning & Evening	Slightly Degraded	42	Slightly Degraded	57	Morning & Evening
7	118	EB	LA	R7.600	LA	R11.400	3.800	Morning	Slightly Degraded	42	Not Degraded	8	Morning & Evening
7	118	WB	LA	R11.400	LA	R7.600	3.800	Morning & Evening	Extremely Degraded	131	Extremely Degraded	131	Morning & Evening
7	134	EB	LA	0.000	LA	4.428	4.428	Morning & Evening	Slightly Degraded	16	Extremely Degraded	99	Not Degraded
7	134	EB	LA	4.428	LA	R8.855	4.427	Evening	Not Degraded	1	Very Degraded	81	Not Degraded
7	134	EB	LA	R8.855	LA	R13.283	4.428	Evening	Not Degraded	2	Slightly Degraded	57	Not Degraded
7	134	WB	LA	R13.300	LA	R8.872	4.428	Evening	Not Degraded	1	Slightly Degraded	50	Not Degraded
7	134	WB	LA	R8.872	LA	4.428	4.427	Evening	Not Degraded	3	Slightly Degraded	50	Not Degraded
7	134	WB	LA	4.428	LA	0.000	4.428	Evening	Not Degraded	0	Slightly Degraded	18	Not Degraded
7	170	NB	LA	R17.505	LA	R20.510	3.005	Evening	Not Degraded	9	Extremely Degraded	126	Evening
7	170	SB	LA	R17.505	LA	R14.500	3.005	Morning	Very Degraded	76	Not Degraded	1	Morning
7	210	EB	LA	R25.000	LA	L29.568	4.568	Evening	Not Degraded	0	Very Degraded	73	Evening
7	210	EB	LA	L29.568	LA	R33.827	4.568	Evening	Not Degraded	0	Extremely Degraded	129	Evening
7	210	EB	LA	R33.827	LA	R38.396	4.569	Evening	Not Degraded	0	Extremely Degraded	124	Evening
7	210	EB	LA	R38.396	LA	R42.964	4.568	Evening	Not Degraded	0	Slightly Degraded	16	Evening
7	210	EB	LA	R42.964	LA	R47.532	4.568	Evening	Not Degraded	0	Very Degraded	85	Evening
7	210	EB	LA	R47.532	LA	R52.100	4.568	Morning & Evening	Extremely Degraded	131	Slightly Degraded	44	Morning & Evening
7	210	WB	LA	R38.395	LA	R33.827	4.568	Morning & Evening	Very Degraded	74	Slightly Degraded	19	Morning & Evening
7	210	WB	LA	R33.827	LA	L29.568	4.568	Morning & Evening	Slightly Degraded	53	Slightly Degraded	51	Morning & Evening
7	405	NB	LA	4.842	LA	9.861	4.843	Morning	Slightly Degraded	14	Not Degraded	1	Morning

Table 3

DEGRADED HOV LANE SEGMENTS
JULY 1 TO DECEMBER 31, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening		Peak Hour Degraded Jan–Jun 2011
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded	
(Continued from page 24)													
7	405	NB	LA	9.861	LA	14.703	4.842	Morning & Evening	Very Degraded	74	Very Degraded	73	Morning & Evening
7	405	NB	LA	14.703	LA	19.546	4.843	Morning	Extremely Degraded	99	Not Degraded	0	Morning
7	405	NB	LA	19.546	LA	24.388	4.842	Morning	Slightly Degraded	42	Not Degraded	1	Morning
7	405	NB	LA	24.388	LA	26.400	2.012	Morning & Evening	Very Degraded	90	Slightly Degraded	59	Morning
7	405	NB	LA	38.915	LA	43.758	5.158	Evening	Not Degraded	0	Slightly Degraded	47	Not Degraded
7	405	NB	LA	43.758	LA	48.600	4.842	Evening	Not Degraded	0	Slightly Degraded	37	Not Degraded
7	405	SB	LA	48.600	LA	43.758	4.842	Morning	Slightly Degraded	17	Not Degraded	10	Not Degraded
7	405	SB	LA	43.758	LA	38.915	4.843	Morning & Evening	Extremely Degraded	125	Slightly Degraded	16	Morning
7	405	SB	LA	38.915	LA	34.073	4.842	Morning	Slightly Degraded	50	Not Degraded	0	Morning
7	405	SB	LA	26.400	LA	24.388	2.012	Evening	Not Degraded	0	Slightly Degraded	48	Not Degraded
7	405	SB	LA	24.388	LA	19.546	4.842	Evening	Not Degraded	0	Slightly Degraded	64	Evening
7	405	SB	LA	19.546	LA	14.703	4.843	Morning & Evening	Slightly Degraded	14	Very Degraded	70	Evening
7	405	SB	LA	14.703	LA	9.861	4.842	Evening	Not Degraded	0	Very Degraded	83	Evening
7	405	SB	LA	9.861	LA	4.842	4.843	Evening	Not Degraded	0	Very Degraded	76	Evening
7	405	SB	LA	4.842	LA	0.000	4.842	Evening	Not Degraded	1	Extremely Degraded	115	Evening
7	605	NB	LA	R4.140	LA	R8.280	4.140	Morning & Evening	Slightly Degraded	25	Slightly Degraded	25	Not Degraded
7	605	NB	LA	R8.280	LA	R12.420	4.140	Evening	Not Degraded	0	Slightly Degraded	43	Evening
7	605	NB	LA	R12.420	LA	R16.560	4.140	Evening	Not Degraded	0	Slightly Degraded	55	Evening
7	605	SB	LA	R16.560	LA	R12.420	4.140	Evening	Not Degraded	3	Slightly Degraded	29	Evening
7	605	SB	LA	R12.420	LA	R8.280	4.140	Evening	Not Degraded	6	Slightly Degraded	55	Evening
8	10	EB	SBD	4.950	SBD	9.900	4.950	Evening	Not Degraded	0	Slightly Degraded	44	Evening
8	10	WB	SBD	9.900	SBD	4.950	4.950	Evening	Not Degraded	6	Slightly Degraded	42	Evening
8	60	EB	SBD	R0.000	SBD	R4.987	4.987	Evening	Not Degraded	0	Very Degraded	73	Evening
8	60	EB	RIV	10.266	RIV	15.413	4.988	Evening	Not Degraded	0	Slightly Degraded	16	Evening
8	60	EB	RIV	15.413	RIV	20.400	4.987	Evening	Not Degraded	0	Slightly Degraded	38	Evening
8	60	WB	RIV	15.413	RIV	10.266	4.988	Morning	Slightly Degraded	14	Not Degraded	9	Not Degraded
8	91	EB	RIV	R0.000	RIV	4.266	4.378	Evening	Not Degraded	1	Extremely Degraded	120	Evening
8	91	EB	RIV	4.266	RIV	8.644	4.378	Evening	Not Degraded	1	Extremely Degraded	102	Evening
8	91	EB	RIV	13.022	RIV	17.400	4.378	Morning	Very Degraded	69	Not Degraded	7	Morning
8	91	WB	RIV	8.644	RIV	4.266	4.378	Morning & Evening	Very Degraded	97	Slightly Degraded	34	Morning & Evening

Table 3

DEGRADED HOV LANE SEGMENTS
JULY 1 TO DECEMBER 31, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening		Peak Hour Degraded Jan–Jun 2011
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded	
(Continued from page 25)													
8	91	WB	RIV	4.266	RIV	R0.000	4.378	Morning	Slightly Degraded	14	Not Degraded	1	Not Degraded
8	210	EB	SBD	0.000	SBD	4.933	4.933	Evening	Not Degraded	0	Slightly Degraded	31	Evening
8	215	SB	RIV	43.300	RIV	40.646	2.654	Evening	Not Degraded	2	Extremely Degraded	104	Evening
11	5	NB	SD	R30.700	SD	R34.600	3.900	Evening	Not Degraded	0	Slightly Degraded	61	Evening
11	5	NB	SD	R34.600	SD	R38.500	3.900	Evening	Not Degraded	1	Very Degraded	78	Evening
11	15	NB	SD	M15.900	SD	M19.800	3.900	Evening	Not Degraded	0	Slightly Degraded	28	Evening
11	15	SB	SD	M19.800	SD	M15.900	3.900	Morning	Slightly Degraded	49	Not Degraded	0	Not Degraded
12	5	NB	ORA	20.497	ORA	R25.097	4.600	Morning & Evening	Slightly Degraded	27	Slightly Degraded	50	Morning & Evening
12	5	NB	ORA	R25.097	ORA	29.703	4.599	Morning & Evening	Slightly Degraded	62	Extremely Degraded	111	Morning & Evening
12	5	NB	ORA	29.703	ORA	34.302	4.599	Evening	Not Degraded	0	Extremely Degraded	120	Evening
12	5	SB	ORA	38.901	ORA	34.302	4.599	Morning	Slightly Degraded	61	Not Degraded	3	Morning
12	5	SB	ORA	34.302	ORA	29.703	4.599	Morning & Evening	Slightly Degraded	48	Slightly Degraded	30	Morning & Evening
12	5	SB	ORA	29.703	ORA	R25.096	4.600	Morning & Evening	Slightly Degraded	18	Slightly Degraded	14	Not Degraded
12	5	SB	ORA	20.497	ORA	15.898	4.599	Evening	Not Degraded	0	Slightly Degraded	21	Not Degraded
12	5	SB	ORA	11.299	ORA	6.700	4.599	Morning & Evening	Slightly Degraded	24	Slightly Degraded	26	Morning & Evening
12	55	NB	ORA	R6.000	ORA	R9.761	3.761	Evening	Not Degraded	1	Slightly Degraded	64	Evening
12	55	NB	ORA	R9.761	ORA	13.539	3.760	Evening	Not Degraded	0	Slightly Degraded	36	Not Degraded
12	55	SB	ORA	17.300	ORA	13.539	3.761	Morning	Very Degraded	76	Not Degraded	3	Morning
12	55	SB	ORA	13.539	ORA	R9.761	3.760	Morning	Slightly Degraded	24	Not Degraded	4	Morning
12	57	NB	ORA	10.800	ORA	14.700	3.900	Morning & Evening	Slightly Degraded	16	Slightly Degraded	37	Evening
12	57	NB	ORA	14.700	ORA	18.600	3.900	Morning & Evening	Slightly Degraded	38	Slightly Degraded	38	Morning & Evening
12	57	NB	ORA	18.600	ORA	R22.500	3.900	Evening	Not Degraded	0	Very Degraded	68	Evening
12	57	SB	ORA	R22.500	ORA	18.600	3.900	Morning	Slightly Degraded	61	Not Degraded	6	Not Degraded
12	57	SB	ORA	14.700	ORA	10.800	3.900	Morning & Evening	Slightly Degraded	53	Slightly Degraded	21	Morning
12	91	WB	ORA	R9.870	ORA	5.356	4.514	Evening	Not Degraded	1	Slightly Degraded	14	Not Degraded
12	91	WB	ORA	5.356	ORA	0.841	4.515	Evening	Not Degraded	2	Slightly Degraded	21	Not Degraded
12	91	WB	ORA	0.841	ORA	R0.000	4.515	Evening	Not Degraded	7	Slightly Degraded	53	Evening

Table 3

DEGRADED HOV LANE SEGMENTS
JULY 1 TO DECEMBER 31, 2011

District	Route	Direction	County	Begin Post Mile	County	End Post Mile	Segment Length	Peak Hour Degraded	Morning		Evening		Peak Hour Degraded Jan–Jun 2011
									Degradation Category	Number of Days Degraded	Degradation Category	Number of Days Degraded	
(Continued from page 26)													
12	405	NB	ORA	5.080	ORA	9.929	4.849	Evening	Not Degraded	1	Slightly Degraded	48	Evening
12	405	NB	ORA	9.929	ORA	14.779	4.850	Evening	Not Degraded	0	Extremely Degraded	114	Evening
12	405	NB	ORA	14.779	ORA	19.628	4.849	Morning & Evening	Slightly Degraded	19	Very Degraded	89	Evening
12	405	SB	ORA	19.628	ORA	14.779	4.849	Morning & Evening	Slightly Degraded	51	Slightly Degraded	23	Morning
12	405	SB	ORA	9.929	ORA	5.080	4.849	Morning & Evening	Slightly Degraded	27	Extremely Degraded	122	Evening
						Total	656.517						

4. YEAR-TO-YEAR COMPARISON BETWEEN 2010 AND 2011

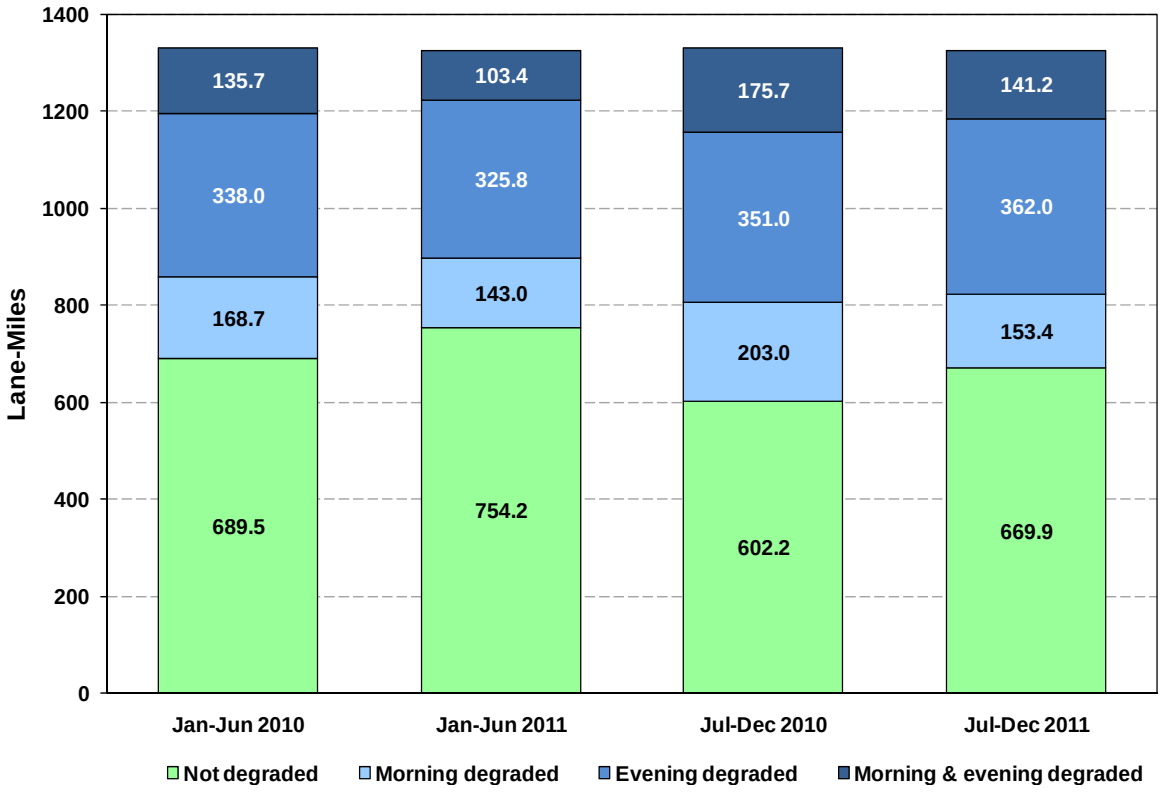
Performance data from 2011 was compared to performance data from 2010. As seen in Figure 17, there was less degradation in 2011 than in 2010. During the first half of 2011, the number of degraded lane-miles decreased approximately 11 percent compared with the same period in 2010, going from approximately 642 lane-miles to about 572 lane-miles. The number of degraded lane-miles in the second half of 2011 was 10 percent less than in the same period in 2010, going from approximately 730 lane-miles to approximately 657 lane-miles. Degradation was also not as frequent in 2011, with lower numbers of extremely degraded segments compared to 2010.

Figures 18 and 19 compare the frequency of degradation during the morning and evening peak hour periods, respectively, for the first and second six-month periods of 2010 and 2011. In 2010, degradation was more extensive in the evening peak hour, just as it was in 2011. Degradation was more extensive in the second half of 2010 compared to the first half of the year. This same pattern was also observed in 2011.

It should be noted that the total number of lane-miles monitored in 2011 decreased by about seven lane-miles compared with 2010 because of lack of data from some segments, likely due to reliability issues with the traffic monitoring system.

Figure 17

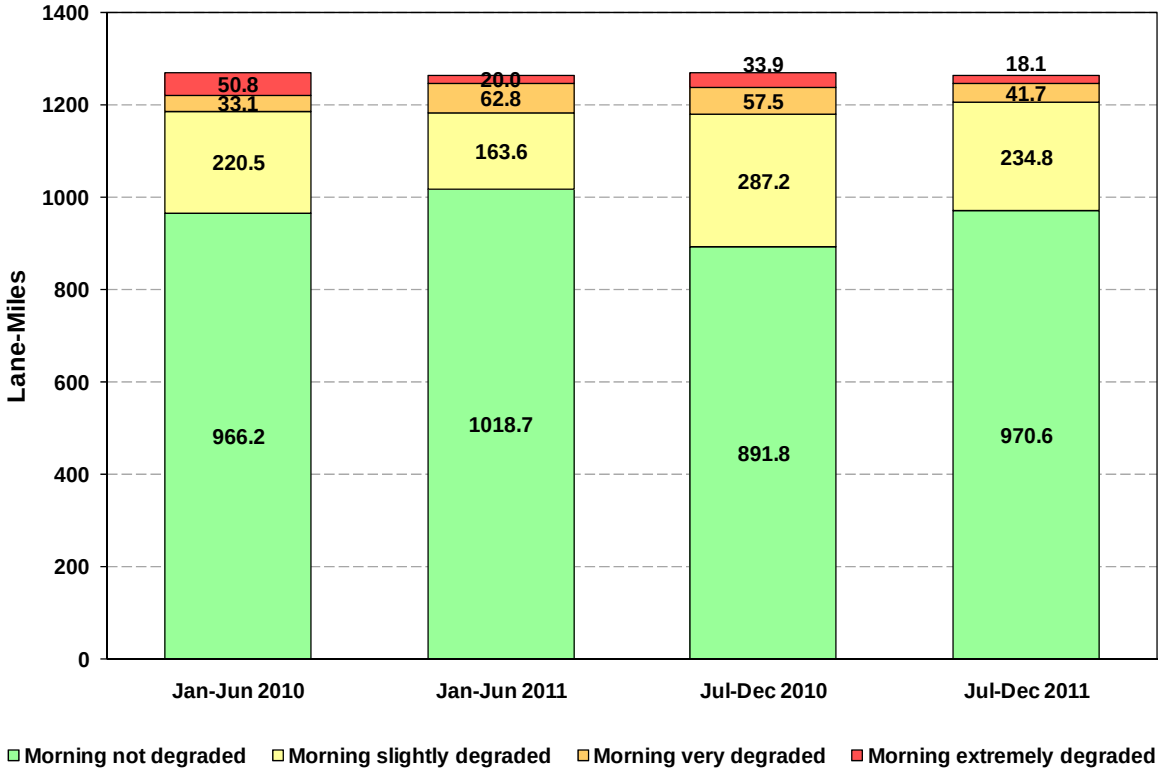
2010 AND 2011 STATEWIDE DEGRADATION BREAKDOWN



NOTE: 1331.8 lane-miles total for 2010; 1326.5 lane-miles total for 2011. Numbers may not add up due to rounding.

Figure 18

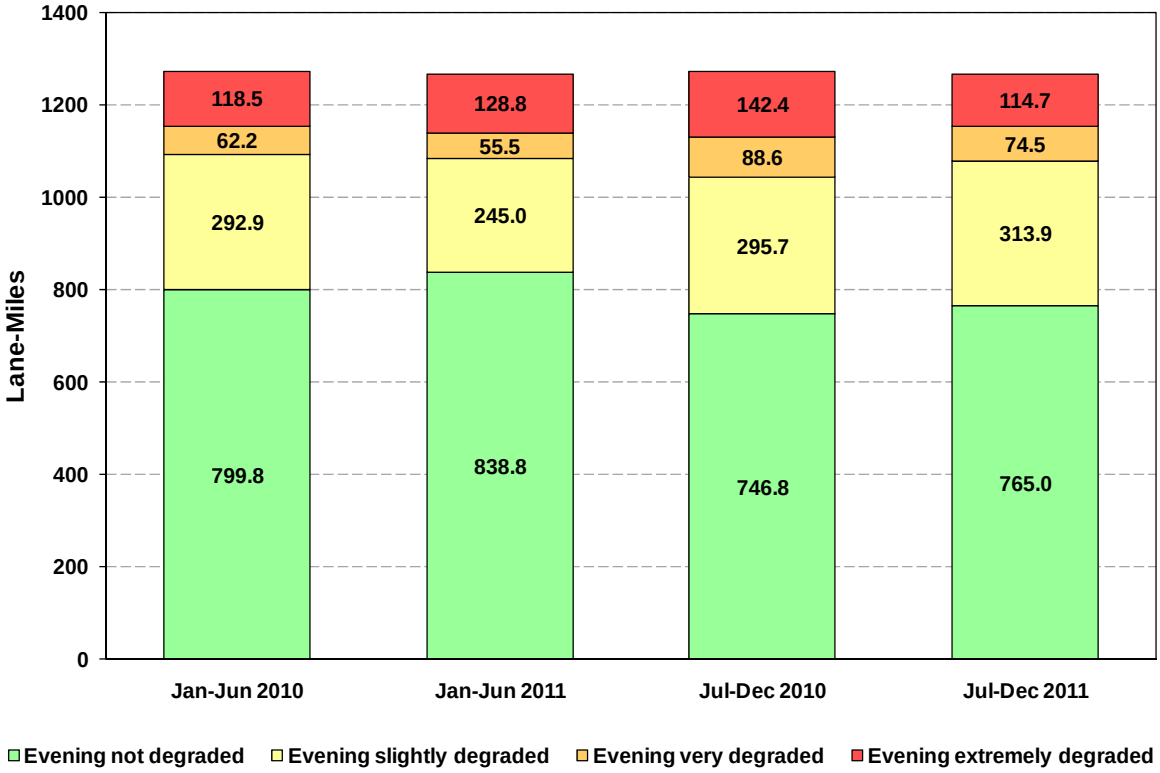
2010 AND 2011 MORNING PEAK HOUR STATEWIDE DEGRADATION SEVERITY



NOTE: 1270.5 lane-miles total for 2010; 1265.1 lane-miles total for 2011. Numbers may not add up due to rounding.

Figure 19

2010 AND 2011 EVENING PEAK HOUR STATEWIDE DEGRADATION SEVERITY



NOTE: 1273.5 lane-miles total for 2010; 1268.1 lane-miles total for 2011. Numbers may not add up due to rounding.

5. CONCLUSIONS

In 2011, about 13 percent of the vehicle miles traveled on freeways with HOV lanes during the morning peak hour was on the HOV lanes themselves. During the evening peak hour, this number was approximately 15 percent. Given these levels of usage and the very stringent threshold for degradation, it will be difficult for the State to meet the federal performance standard requirement.

The sunset of the hybrid decal program provided an opportunity to determine the role those vehicles may have had in contributing to degradation. The data revealed that degradation actually increased after the program ended. The increase in degradation during the second half of the year is a trend that was observed in previous years. There generally is an overall increase in congestion on the freeway system in the latter half of the year, particularly after school begins in the late summer. These facts seem to indicate that recurrent congestion or other factors could be causing degradation. These other factors could include:

- Vehicles from the general-purpose lanes merging into the HOV lane at the end of the HOV facility. Many HOV facilities become general-purpose lanes at the end of the facility; traffic from adjacent general-purpose lanes will enter the lane at that point, which could cause congestion in the HOV lane upstream.

- Vehicles from the HOV lanes merging into congested general-purpose lanes. When these vehicles cannot easily merge into the general-purpose lanes, it can slow down vehicles in the HOV lane and in some cases lead to breakdown conditions.

- Traffic incidents on a freeway that affect HOV lanes. This could also include incidents that did not occur on the HOV facility.

- Inclement weather resulting in lower speeds.

Caltrans is in the process of compiling a degradation determination report for 2012. As part of the federal requirements, Caltrans is reviewing the data to identify possible causes of degradation and developing an action plan to bring degraded lanes into compliance within 180 days. Because degradation tends to increase in the second half of the year, Caltrans and FHWA have agreed that action needs to be taken only on facilities identified as degraded in the second half of 2011. This action plan has been provided to the FHWA as a supplement to this report.

APPENDIX

Table A–1

DISTRIBUTION OF HYBRID AND ILEV DECALS BY COUNTY

County	Number of Yellow Hybrid Decals as of 06/30/2011	Number of White ILEV Decals as of 12/31/2011	County	Number of Yellow Hybrid Decals as of 06/30/2011	Number of White ILEV Decals as of 12/31/2011
Alameda	6,109	661	San Joaquin	456	19
Alpine	4	0	San Luis Obispo	250	7
Amador	43	0	San Mateo	2,800	469
Butte	84	2	Santa Barbara	407	18
Calaveras	71	2	Santa Clara	7,173	1,324
Colusa	11	0	Santa Cruz	958	68
Contra Costa	3,665	370	Shasta	41	0
Del Norte	3	0	Sierra	1	0
El Dorado	631	15	Siskiyou	11	0
Fresno	249	10	Solano	903	229
Glenn	8	3	Sonoma	1,322	70
Humboldt	31	0	Stanislaus	212	3
Imperial	14	1	Sutter	37	2
Inyo	3	0	Tehama	12	0
Kern	242	17	Trinity	4	0
Kings	18	0	Tulare	61	11
Lake	44	2	Tuolumne	35	2
Lassen	3	1	Ventura	1,616	125
Los Angeles	27,216	6,139	Yolo	550	64
Madera	34	27	Yuba	18	1
Marin	2,030	124	Out-of-State	86	730
Mariposa	14	1	Unknown	0	292
Mendocino	142	6			
Merced	76	1	Total	84,902	15,999
Modoc	1	0			
Mono	10	0			
Monterey	548	20			
Napa	376	30			
Nevada	194	3			
Orange	8,856	2,382			
Placer	696	34			
Plumas	5	0			
Riverside	2,874	437			
Sacramento	2,511	377			
San Benito	106	7			
San Bernardino	2,270	186			
San Diego	5,905	765			
San Francisco	2,852	942			