CALIFORNIA DEPARTMENT OF TRANSPORTATION

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN

Prepared by

Division of Traffic Operations
Office of Traffic Management

Submitted to

Federal Highway Administration
California Division

July 31, 2013

INTRODUCTION

As required under title 23, United States Code, section 166(d), the California Department of Transportation (Caltrans) has developed the "California High-Occupancy Vehicle Lane Degradation Action Plan" which lists strategies for addressing degraded high-occupancy vehicle (HOV) lanes. As identified in the "2011 California High-Occupancy Vehicle Lane Degradation Determination Report," Table 1 summarizes degradation on the monitored HOV lane segments in the 2011 calendar year.

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)

The data shows that degradation increased in the second half of the year. This increase is consistent with past trends where congestion levels typically increase on all freeways during the second half of the calendar year. Based on this trend, Caltrans and the Federal Highway Administration (FHWA) agreed that the action plan will address only the degraded facilities identified in the second half of 2011. This action plan was developed by Caltrans district staff based on a review of the data and field conditions and in consultation with staff from the FHWA.

ACTION PLAN DESCRIPTION

A map of the HOV lane facilities in each district is provided with the degraded segments shown; each map is then followed by the action plan for each degraded segment in the district. The action plan for each degraded segment includes the peak hour period when degradation was observed, the potential causes of degradation, remediation strategies, and reasons for the strategies. Caltrans proposes a mixture of short-term and long-term strategies to reduce or eliminate degradation. These strategies include:

- **Increased Enforcement by the California Highway Patrol:** Violation rates in HOV lanes should not exceed 10 percent; violation rates on some degraded segments exceed this. Caltrans district staff will request increased enforcement from the California Highway Patrol (CHP) in order to lower the violation rates.

- **Improved Incident Response Times:** The Freeway Service Patrol is a joint program provided by Caltrans, the CHP and regional transportation agencies. The Freeway Service Patrol program is a free service of privately owned tow trucks that patrol designated routes on congested urban California freeways during commute periods. They remove disabled and stranded vehicles from the freeway and are a tool to prevent nonrecurring congestion. Presently, the Freeway Service Patrol strives to respond to incidents within 10 minutes. Much of the degradation observed in California is nonrecurring, which means it could be caused by incidents or inclement weather. In order to minimize the potential for degradation, Caltrans and the CHP will explore the possibility of reducing Freeway Service Patrol response times from 10 minutes to 8 minutes.

- **Improved Detection:** A review of the HOV lane traffic data revealed that the detection systems on many of the lanes are frequently off line, reporting data approximately 50 to 60 percent of the time. Ideally, the detection systems should be operating at least 70 percent of the time. In addition, some of the detection equipment was not correctly coded and was providing data on the wrong lanes. The districts will make a significant effort to repair existing vehicle detectors in order to reduce downtime and to increase the percentage of detectors in working order. Improperly coded detection equipment will be fixed in order to ensure that accurate data is being collected.

- **Improved Infrastructure:** Various short-term and long-term infrastructure improvements are planned on HOV lanes which may reduce or eliminate degradation. These include HOV lane gap closure projects, HOV lane extensions, or widening to provide a second HOV lane. Some of these projects were underway in 2011 or will begin construction within the next 1 to 3 years. Caltrans will request that action be deferred on the degraded segments adjacent to these projects until the improvements

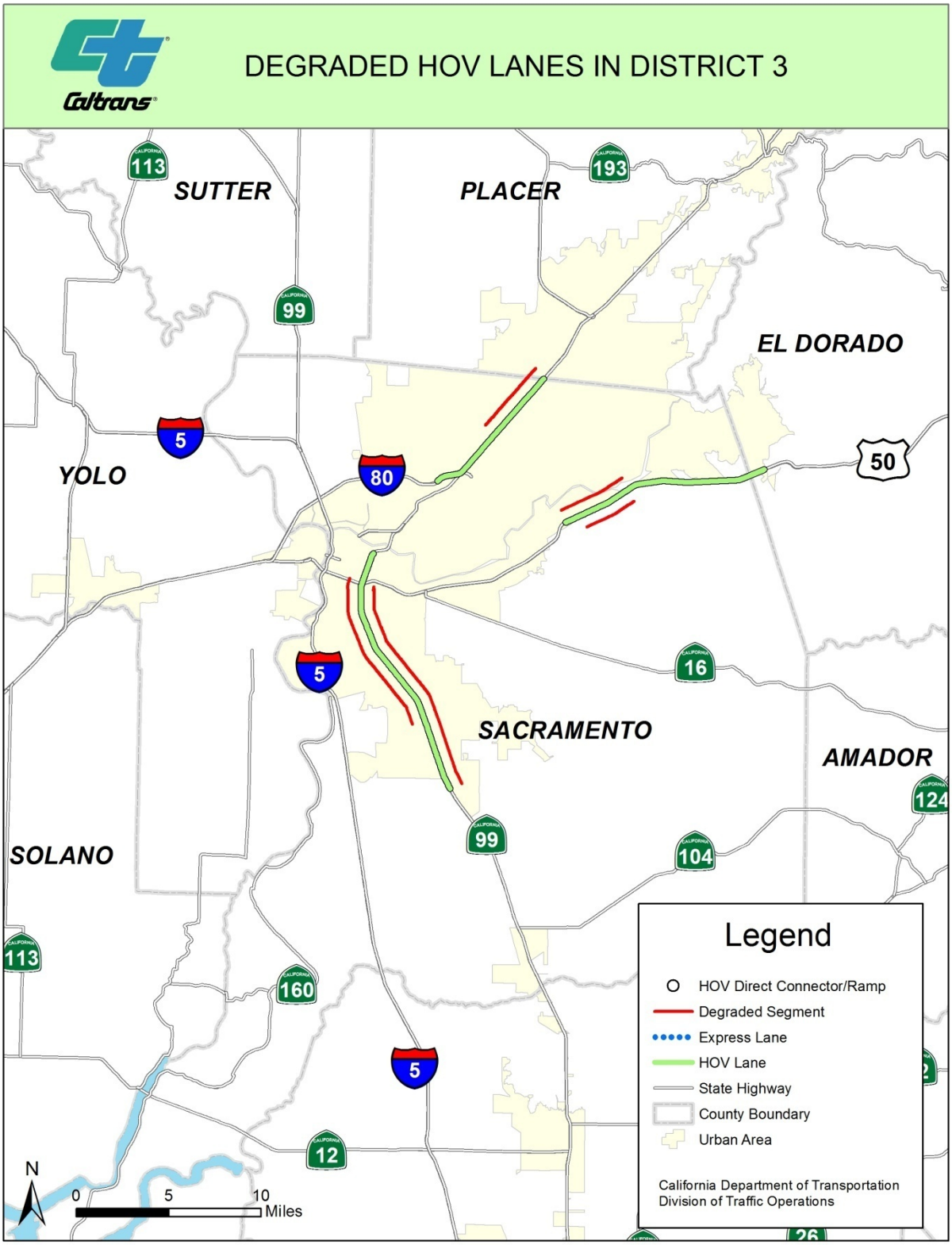
are completed and further analysis is performed. The 2012 degradation determination report may show improvement in those segments where construction has since been completed. Degradation in other locations has been determined to be caused by bottlenecks on adjacent general purpose lanes, causing congestion that affects all lanes of the freeway, including HOV lanes. Some districts will explore minor improvements to eliminate these bottlenecks; in some cases, such improvements were underway in 2011. Caltrans proposes to defer action on these degraded segments until the improvements are completed and further analysis is performed. The 2012 degradation determination report may show improvement in those segments where construction has since been completed.

- **Strategies for Active Traffic Management**: Some Caltrans districts have proposed various active traffic management strategies to further manage demand on freeways. These include on-ramps and freeway connector ramp metering, and "speed harmonization," which will vary speed limits and reduce stop-and-go conditions. In other locations, HOV lanes will be converted to high-occupancy toll (HOT) lanes within the next 3 to 5 years; these improvements will result in improved detection, dedicated enforcement, and in some cases, additional capacity. Conversion to HOT lanes will require a comprehensive evaluation of existing freeway operations. This evaluation will result in changes in access to HOV lanes, which will reduce friction with adjacent general purpose lanes and improve speeds.

Changing occupancy requirements on HOV lanes is a strategy that Caltrans may selectively employ if the traffic volume in the HOV lane justifies it and the effects to the rest of the freeway can be minimized. Increasing occupancy requirements may result in significant underutilization of the HOV lanes, and could result in additional congestion in adjacent general purpose lanes since former users of HOV lanes would be added to the traffic stream. Conversion to a HOT lane in conjunction with any occupancy increase would be ideal in order to minimize these impacts. One Caltrans district is proposing to increase occupancy on two corridors; in one instance this change would be associated with conversion of the facilities to HOT lanes.

Caltrans is not looking to prohibit inherently low emission vehicles from HOV lanes at this time. These vehicles constitute a very low percentage of the users of HOV lanes. Furthermore, prohibiting these vehicles runs counter to an existing Governor's Executive Order that directs State agencies to take action to support and incentivize the purchase and use of these vehicles.

The Division of Traffic Operations has established a statewide managed lanes manager who will serve as Caltrans' single focal point for all issues related to managed lanes. This individual will work with the districts, other divisions within Caltrans, and external partners, including regional transportation agencies, the CHP, and the FHWA to identify and implement strategies that will improve and enhance HOV lane operations and protect the investment that has been made to the system.


DEGRADED HOV LANES IN DISTRICT 3
SUTTER
PLACER
EL DORADO
YOLO
SACRAMENTO
AMADOR
SOLANO
113
193
99
5
80
50
16
124
104
160
12
N
0
5
10
Miles
Legend
HOV Direct Connector/Ramp
Degraded Segment
Express Lane
HOV Lane
State Highway
County Boundary
Urban Area
California Department of Transportation
Division of Traffic Operations

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 3

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
50	EB	SAC	12.500	SAC	16.311	3.811	0.0	14.5	Evening	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage; 24 potential congestion causing incidents occurred within this segment and time frame. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Add ramp metering to all eastbound ramps. A project is currently in construction. • Repair and update vehicle detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite cities of Folsom and Rancho Cordova have increased traffic volumes and congested all lanes on US- 50. • Properly operational vehicle detector system will ensure data accuracy.
50	WB	SAC	16.312	SAC	12.500	10.982	18.3	0.8	Morning	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Add ramp metering to all eastbound ramps. A project is currently in construction. • HOV lane extension westward was under construction in 2011, opened to traffic in 2012. Conduct further analysis to determine if there have been any improvements after construction was completed. • Repair and update detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite cities of Folsom and Rancho Cordova have increased traffic volumes and congested all lanes on US-50. • Properly operational vehicle detector system will ensure data accuracy.

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 5)												
80	WB	SAC	18.000	SAC	13.904	4.096	13.7	0.0	Morning	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. 13 potential congestion causing incidents occurred within this segment and time frame. • Faulty vehicle detector system.	• Coordinate with the CHP to Increase enforcement on the HOV lane. • Adjust ramp metering rates on ramps in this segment and in segments upstream. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response time. • Repair and update vehicle detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite cities of Roseville and Rocklin has increased traffic volumes and congested all lanes on I-80. • Properly operational vehicle detector system will ensure data accuracy.
99	NB	SAC	11.900	SAC	16.030	4.131	27.5	0.0	Morning	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. • Construction of the southbound auxiliary lanes from Mack Road to Cosumnes River Blvd. throughout year 2011 impacted northbound and southbound HOV lane speeds. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Reduce vehicle release rates on NB on-ramps in this segment and in segments upstream. • Repair and update vehicle detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite City of Elk Grove has increased traffic volumes and congested all lanes on Route 99. • Properly operational vehicle detector system will ensure data accuracy.

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STRATEGIES FOR DISTRICT 3

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 6)												
99	NB	SAC	16.031	SAC	20.165	4.134	33.6	0.0	Morning	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. 12 potential congestion causing incidents occurred within this segment and time frame. • Construction of the southbound auxiliary lanes from Mack Road to Cosumnes River Blvd. throughout year 2011 impacted northbound and southbound HOV lane speeds. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Reduce vehicle release rates on NB on-ramps in this segment and in segments upstream. • Repair and update vehicle detector system to improve data collection. • Review 2012 traffic data to determine if auxiliary lane project improved conditions.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite City of Elk Grove has increased traffic volumes and congested all lanes on Route 99. • Properly operational vehicle detector system will ensure data accuracy. • Auxiliary lane project removed bottleneck.
99	NB	SAC	20.166	SAC	R24.300	4.134	35.9	0.8	Morning	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. 13 potential congestion causing incidents occurred within this segment and time frame. • Narrow lanes and shoulders from Fruitridge Road to US-50. • Vehicle weaving conflicts at the US-50 interchange. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Reduce vehicle release rates on NB on-ramps in this segment and in segments upstream. • Repair and update vehicle detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite City of Elk Grove has increased traffic volumes and congested all lanes on Route 99. • Properly operational vehicle detector system will ensure data accuracy.

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Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 7)												
99	SB	SAC	R24.300	SAC	20.167	4.133	0.0	50.4	Evening	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. • Narrow lanes and shoulders from US-50 to Fruitridge Road. • Lane drops at Fruitridge Road and Mack Road create bottlenecks that reduce overall capacity, throughput and speed. The bottleneck at Mack Road was eliminated through recent construction of the southbound auxiliary lanes from Mack Road to Cosumnes River Blvd. • Faulty vehicle detector system.	• Coordinate with the California Highway Patrol to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Add ramp metering to all southbound ramps. A project is currently in the project development process. • Repair and update vehicle detector system to improve data collection. • Review 2012 traffic data to determine if improvements at Mack Road resulted in improved conditions.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite City of Elk Grove has increased traffic volumes and congested all lanes on Route 99. • Properly operational vehicle detector system will ensure data accuracy. • Preliminary analysis indicates general purpose congestion may have been reduced by improvements at Mack Road.
99	SB	SAC	20.168	SAC	16.034	4.134	0.8	94.7	Evening	• High HOV violations. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. • Narrow lanes and shoulders from US-50 to Fruitridge Road. • A lane drop at Mack Road reduces overall capacity, throughput and speed. This bottleneck was eliminated through recent construction of the southbound auxiliary lanes from Mack Road to Cosumnes River Blvd. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. Current average response time is 10 minutes. District has started initial discussions with the CHP to reduce the response times. • Add ramp metering to all southbound ramps. A project is currently in the project development process. • Repair and update detector system to improve data collection • Review 2012 traffic data to determine if improvements at Mack Road resulted in improved conditions.	• Remove ineligible vehicles from the HOV lane. • Rapid growth in the satellite City of Elk Grove has increased traffic volumes and congested all lanes on Route-99. • Good detector health will provide accurate data. • Preliminary analysis indicates general purpose congestion may have been reduced by improvements at Mack Road.


DEGRADED HOV LANES IN DISTRICT 4
SONOMA
MARIN
SOLANO
CONTRA COSTA
SAN FRANCISCO
ALAMEDA
SAN MATEO
SANTA CLARA
Legend
HOV Direct Connector/Ramp
Degraded Segment
Express Lane
HOV Lane
State Highway
County Boundary
Urban Area
California Department of Transportation
Division of Traffic Operations
0 5 10 20
Miles
N

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
4	EB	CC	R20.088	CC	24.400	4.288	no data	94.7	Evening	• End of the HOV Lane. General purpose lanes bottleneck as a result of lane reduction from four lanes to two lanes within a short distance.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. • Future widening up to Contra Loma Blvd; this project will extend the HOV lane and add second general purpose lane (begin construction March 2012 and end construction Sept. 2015).	• Remove ineligible vehicles from the HOV lane. • General purpose lane congestion back up into HOV lane. • Improve traffic demand management.
80	EB	ALA	2.500	ALA	6.552	4.052	2.3	99.2	Evening	• HOV volume exceeds capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • mprove the response time for the Freeway Service Patrol. • Future Integrated Corridor Mobility project including active traffic management (variable speed limits) and ramp metering (begin construction October 2011 and end construction January 2015). • Future project to convert HOV lane to a HOT lane. Currently in PA/ED phase. No construction dates yet.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
80	WB	CC	2.923	ALA	6.423	4.523	38.2	13.0	Morning & Evening	• HOV volume exceeds capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. • Future Integrated Corridor Mobility project including active traffic management (variable speed limits) and ramp metering (begin construction October 2011 and; end construction January 2015). • Future project to convert HOV lane to a HOT lane. Currently in PA/ED phase. No construction dates yet.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 10)												
80	WB	ALA	6.423	ALA	1.900	4.523	22.9	95.4	Morning & Evening	• HOV volume exceeds capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. • Future Integrated Corridor Mobility project including active traffic management (variable speed limits) and ramp metering (begin construction October 2011 and end construction January 2015). • Future project to convert HOV lane to a HOT lane. Currently in PA/ED phase. No construction dates yet.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
85	NB	SCL	4.795	SCL	9.590	4.795	17.6	0.0	Morning	• HOV volume is at or near capacity. • Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2015).	• Properly operational vehicle detector system will ensure data accuracy. • Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
85	NB	SCL	9.590	SCL	R14.210	4.796	18.3	0.8	Morning	• HOV volume is at or near capacity. • Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2015).	• Properly operational vehicle detector system will ensure data accuracy. • Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 11)												
85	SB	SCL	R19.005	SCL	R14.210	4.795	0.0	33.6	Evening	• HOV volume is at or near capacity. • Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2015).	• Properly operational vehicle detector system will ensure data accuracy. • Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
87	NB	SCL	3.748	SCL	7.297	3.549	34.4	0.8	Morning	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Coordinate with the CHP to increase enforcement on the HOV lane.	• Properly operational vehicle detector system will ensure data accuracy. • Remove ineligible vehicles from the HOV lane.
101	NB	SCL	30.810	SCL	R35.534	4.724	13.0	0.8	Morning	• HOV volume is at or near capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016).	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
101	NB	SCL	R35.534	SCL	40.254	4.724	25.2	0.0	Morning	• HOV volume is at or near capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016).	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
101	NB	SM	1.876	SM	6.600	4.724	0.0	13.0	Evening	• Faulty vehicle detector system. • Reduced speeds in HOV lane could be caused by incidents. • HOV lane ends at this location. Congestion in the general purpose lanes could extends into the HOV lane at the end termini.	• Repair and update detector system to improve data collection. • A construction project to add auxiliary lanes was started in July 2011 and ended in November 2012. • Coordinate with the CHP to increase enforcement on the HOV lane.	• Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management. • Remove ineligible vehicles from the HOV lane.

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 12)												
101	NB	MRN	3.800	MRN	8.323	4.523	no data	78.6	Evening	• HOV lane speeds drop in response to congestion in the general purpose lanes near Sir Francis Drake and Lucky Dr. interchange where access to eastbound I-580 is located. • Faulty vehicle detector system.	• Greenbrae interchange modification project (braided ramps) to relieve weaving within this area. (Begin construction January 2016 and end construction February 2018) • Coordinate with the CHP to increase enforcement on the HOV lane. • Repair and update detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management. • Properly operational vehicle detector system will ensure data accuracy.
101	SB	SON	21.600	SON	15.200	6.400	0.8	31.3	Evening	• On-going construction for an HOV lane at Wilfred and between Rohnert Park Expressway and Old Redwood Highway. Work now completed. • Temporary freeway realignment due to construction activities resulting in loop detectors not aligned properly with specific lanes.	• Defer action pending further review now that construction of HOV lane is completed.	• Project established a continuous HOV facility.
101	SB	MRN	18.900	MRN	12.846	6.054	51.9	no data	Morning	• Only 30 minutes of HOV data is analyzed because HOV lane operation ends at 8:30 AM. • Fluctuation to the vehicle movements as a result of the transitional period when the HOV lane operation ends and it converts into a general purpose lane. • Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
101	SB	SM	6.600	SM	1.876	4.724	67.9	28.2	Morning & Evening	• HOV volume is at or near capacity. • This freeway segment was under construction in 2011 through 2012 to add auxiliary lanes between Marsh Road and Embarcadero Road/Oregon Expressway. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • A construction project to add auxiliary lanes was started in July 2011 and ended in November 2012. • A project is underway to establish two HOV lanes downstream from this segment which will eventually be converted into dual HOT lanes (begin construction November 2011 and end construction August 2013).	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 13)												
101	SB	SM	1.876	SCL	49.702	4.724	0.0	86.3	Evening	• HOV volume is at or near capacity. • This freeway segment was under construction in 2011 through 2012 to add auxiliary lanes between Marsh Road and Embarcadero Road/Oregon Expressway. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • A construction project to add auxiliary lanes was started in July 2011 and ended in November 2012. • A project is underway to establish two HOV lanes downstream from this segment which will eventually be converted into dual HOT lanes (begin construction November 2011 and end construction August 2013).	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
101	SB	SCL	44.978	SCL	40.254	4.724	0.0	58.8	Evening	• HOV lane speed drop in response to congestion in the general purpose lanes between De La Cruz Boulevard and SR-87, and between De La Cruz Boulevard and Fair Oaks Avenue. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Repair and update detector system to improve data collection. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016).	• Remove ineligible vehicles from the HOV lane. • Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.
101	SB	SCL	40.254	SCL	R35.534	4.724	0.0	35.1	Evening	• HOV volume is at or near capacity. • Faulty vehicle detector system.	• • Coordinate with the CHP to increase enforcement on the HOV lane. • Repair and update detector system to improve data collection. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016).	• Remove ineligible vehicles from the HOV lane. • Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.

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							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 14)												
101	SB	SCL	R35.534	SCL	30.810	4.724	27.5	41.2	Morning & Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Coordinate with the CHP to increase enforcement on the HOV lane. • Project to add a lane between Story Road interchange and Yerba Buena interchange. Modify Tully interchange (begin construction November 2010 and end construction October 2012) and Capitol Expressway interchange (begin construction August 2012 and end construction December 2014). • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016).	• Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.
101	SB	SCL	30.810	SCL	R26.448	4.724	6.9	24.4	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016).	• Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.
101	SB	SCL	R21.724	SCL	R17.000	4.724	0.0	19.8	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction fall 2016). • Future ramp metering project	• Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 4

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 15)												
237	EB	SCL	3.000	SCL	R6.241	3.241	1.5	14.5	Evening	• Inadequate vehicle detector system at this segment.	• Repair and update detector system to improve data collection. • Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to extend the HOT lane from Zanker Road to Mathlida Avenue.	• Properly operational vehicle detector system will ensure data accuracy. • Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
237	EB	SCL	R6.241	SCL	9.500	3.241	0.0	19.1	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Conversion of the HOV lane to an HOT lane was completed in 2012 between Zanker Road and I-880 (begin construction summer 2011 and end construction spring 2012).	• Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.
237	WB	SCL	9.500	SCL	R6.265	3.266	13.7	4.6	Morning	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Conversion of the HOV lane to an HOT lane was completed in 2012 between I-880 and North First Street (begin construction summer 2011 and end construction spring 2012).	• Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.
280	NB	SCL	L4.700	SCL	6.879	3.561	11.5	0.0	Morning	• High HOV violations. • Geometric constraint and bottlenecks along this corridor. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • I-280/I-880/Stevens Creek interchange modification in construction to relieve congestion on I-280 at this location (begin construction September 2012 and end construction March 2015). • Ramp metering activated in 2012 between US-101 and I-880. • Repair and update detector system to improve data collection.	• Remove ineligible vehicles from the HOV lane. • Improve operations at the I-280/I-880 interchange. • Improve traffic demand management. • Properly operational vehicle detector system will ensure data accuracy.
280	NB	SCL	10.439	SCL	14.000	3.561	32.8	0.0	Morning	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 4

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 16)												
280	SB	SCL	10.439	SCL	6.879	3.560	0.8	16.8	Evening	• HOV lane volume is at capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
280	SB	SCL	6.879	SCL	L4.700	3.561	0.0	10.7	Evening	• Increased seasonal traffic within the vicinity of shopping malls along the corridor during the winter months.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
580	EB	ALA	13.048	ALA	10.333	2.715	0.0	19.8	Evening	• High traffic demand along the corridor with a need for a second HOV lane on portion of the corridor. • HOV lane is degraded mainly on Friday evening due to the high volume of commuters leaving the Bay Area for the weekend.	• Improve the response time for Freeway Service Patrol during construction of an auxiliary lane. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction spring 2015). • Future ramp metering project.	• Improve traffic demand management.
580	EB	ALA	10.333	ALA	R7.648	2.714	0.8	83.2	Evening	• End of HOV lane and mainline lane reduction from five lanes to four lanes.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Future freeway widening to add truck climbing lanes. • Future project to convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction fall 2014 and end construction spring 2015). • Future ramp metering project	• Congestion downstream from the HOV lane endpoint backs up into HOV lane. • Improve traffic demand management.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 4

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 17)												
680	NB	ALA	R21.600	CC	R3.898	4.177	14.5	3.8	Morning	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Improve the response time for Freeway Service Patrol during the construction of an auxiliary lane between Crow Canyon and Sycamore (begin construction March 2013 and end construction December 2014). • Future project to convert existing HOV lane to a HOT lane (begin construction Feb. 2015 and end construction November 2015).	• Properly operational vehicle detector system will ensure data accuracy. • Minimize impact of incidents through construction zone. • Improve traffic demand management.
680	NB	CC	R3.898	CC	R8.100	4.177	8.4	33.6	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection. • Improve the response time for Freeway Service Patrol during the construction of an auxiliary lane between Crow Canyon and Sycamore (begin construction March 2013 and end construction December 2014). • Future project to convert existing HOV lane to a HOT lane (begin construction Feb. 2015 and end construction November 2015)..	• Properly operational vehicle detector system will ensure data accuracy. • Minimize impact of incidents through construction zone. • Improve traffic demand management.
680	SB	CC	R18.579	CC	16.300	2.279	36.6	4.6	Morning	• HOV lane ends at this location. • A lane drop at North Main Street resulting in a bottleneck and the congestion extends into the HOV lane.	• Improve the response time for the Freeway Service Patrol. • Coordinate with the CHP to increase enforcement on the HOV lane. • Future southbound HOV lane gap closure project (begin construction 2016 and end construction 2018).	• Minimize incident impacts on the corridor capacity near the HOV end termini. • Remove ineligible vehicles from the HOV lane.
680	SB	ALA	M2.385	SCL	M7.600	4.720	0.0	23.7	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 4

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 18)												
880	NB	SCL	8.700	ALA	3.089	4.616	0.0	39.7	Evening	• HOV lane speed drop in response to congestion in the general purpose lanes. • Faulty vehicle detector system.	• Santa Clara Valley Transportation Agency is assessing a proposal to extend a second HOT lane further north into Alameda County. • Repair and update detector system to improve data collection.	• Improve traffic demand management. • Properly operational vehicle detector system will ensure data accuracy.
880	NB	ALA	7.705	ALA	12.321	4.616	1.5	50.4	Evening	• HOV lane speed drop in response to congestion in the general purpose lanes. • Vehicle weaving conflict at the SR-84 interchange. • Detectors health is poor along this corridor.	• Future project to convert HOV lane to a HOT lane (begin construction March 2015 and end construction Jan. 2016). • Repair and update detector system to improve data collection.	• Improve traffic demand management. • Properly operational vehicle detector system will ensure data accuracy.
880	NB	ALA	12.321	ALA	19.300	6.979	0.0	86.3	Evening	• HOV lane speed drop in response to congestion in the general purpose lanes. • Vehicle weaving conflict at the SR-92 interchange. • Faulty vehicle detector system.	• Future project to convert HOV lane to a HOT lane. (Begin construction March 2015 and end construction Jan. 2016) • Repair and update detector system to improve data collection.	• Improve traffic demand management. • Properly operational vehicle detector system will ensure data accuracy.
880	NB	ALA	R34.700	ALA	R35.400	0.700	0.8	45.8	Evening	• HOV volume exceeds capacity.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Improve the response time for the Freeway Service Patrol. • Apply Integrated Corridor Management strategies on I-80.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management. • Improvements on I-80 may reduce congestion from spilling back onto NB I-880.
880	SB	ALA	22.700	ALA	17.855	4.845	24.4	11.5	Morning & Evening	• High volume coming from SR-238. • Faulty vehicle detector system.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Repair and update detector system to improve data collection. • Future project to convert HOV lane to a HOT lane (begin construction March 2015 and end construction Jan. 2016).	• Remove ineligible vehicles from the HOV lane. • Properly operational vehicle detector system will ensure data accuracy. • Improve traffic demand management.
880	SB	ALA	17.855	ALA	13.009	4.846	23.7	16.8	Morning & Evening	• HOV lane speed drop in response to congestion in the general purpose lanes. • Vehicle weaving conflict at the SR-92 interchange.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert HOV lane to a HOT lane (begin construction March 2015 and end construction Jan. 2016)	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 4

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 19)												
880	SB	ALA	13.009	ALA	8.164	4.845	17.6	0.0	Morning	• HOV lane speed drop in response to congestion in the general purpose lanes. • Vehicle weaving conflict at the SR-84 interchange.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Future project to convert HOV lane to a HOT lane (begin construction March 2015 and end construction Jan. 2016).	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.


DEGRADED HOV LANES IN DISTRICT 7
LOS ANGELES
ORANGE
Legend
Existing
Degraded Segment
Express Lane
HOV Lane-Existing
Toll Road
Unconstructed
State Highway
County Boundary
Urban Area
California Department of Transportation
Division of Traffic Operations
N
0
5
10
Miles

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
5	NB	LA	39.400	LA	42.389	2.989	26.0	49.6	Morning & Evening	• General purpose lane drops at San Fernando Mission Road cause bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Investigate if restriping the general purpose lanes to sustain four lanes is possible.	• Eliminate bottleneck.
5	NB	LA	42.389	LA	R45.600	2.988	8.4	61.1	Evening	• Ongoing construction of the SR-14 HOV connector which opened at the end of 2012.	• Defer action until the effects of the connector are analyzed.	• Completion of direct connector could improve conditions.
5	SB	LA	R45.600	LA	42.389	2.988	31.3	54.2	Morning & Evening	• Ongoing construction of the SR-14 HOV connector which opened at the end of 2012.	• Defer action until the effects of the connector are analyzed.	• Completion of direct connector could improve conditions.
5	SB	LA	42.389	LA	39.400	2.989	19.8	22.1	Morning & Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
10	EB	LA	17.000	LA	20.904	4.559	0.0	13.7	Evening	• Faulty vehicle detector system. Segment may not be properly coded into the system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
10	EB	LA	25.464	LA	31.200	5.736	0.0	100.0	Evening	• Bottleneck at I-605 due to general purpose lane drop and diverge.	• Restripe if possible to eliminate lane drops at the I-605 interchange. • This facility converted to HOT lane in February 2013. Review area after the HOT lane opens and traffic normalizes.	• Eliminate bottleneck.
10	EB	LA	42.400	LA	45.330	2.930	0.0	19.1	Evening	• High vehicle and truck volume from SR-57.	• Meter the connector ramp from SR-57.	• Improve traffic demand management.
10	WB	LA	20.904	LA	17.000	4.559	13.0	0.0	Morning	• Possible congestion due to vehicles merging onto congested traffic on US-101 or onto Alameda Street. • Faulty vehicle detector system. Segment may not be properly coded into the system.	• Verify timing of the Alameda intersection and all on-ramps are metered. • Repair and update detector system to improve data collection.	• Minimize queuing. • Properly operational vehicle detector system will ensure data accuracy.
14	NB	LA	R24.800	LA	R29.281	4.481	No data	10.7	Evening	• HOV lane terminated approaching I-5. The lane has now been extended onto a direct connector to I-5 as of the end of 2012.	• Study this segment after traffic normalizes with the HOV direct connector.	• Study this segment after traffic normalizes with the HOV direct connector.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 22)												
57	NB	LA	R22.551	LA	R4.500	4.500	8.4	64.9	Evening	• High traffic demand from the Orange County area and eastbound SR-60. • This area also has a very high truck volume with steep terrain.	• Further study needed.	• Needs further investigation.
57	SB	LA	R4.500	LA	R22.551	4.500	0.0	33.6	Evening	• High truck volumes.	• Further study needed.	• Needs further investigation.
91	EB	LA	R6.400	LA	R11.167	4.767	0.0	79.4	Evening	• The number of general purpose lanes drops from four to three at the I-710 interchange, causing a bottleneck.	• Investigate if restriping the general purpose lane to sustain four lanes throughout the interchange is possible. • SR-91/I-110 HOV Direct Connector would benefit this area especially with the Artesia Transit Center. • Design in HOV ingress/egress weaving lanes.	• Improve traffic demand management.
91	EB	LA	R11.167	LA	R15.933	4.766	0.0	82.4	Evening	• The number of general purpose lanes drops from four lanes to three lanes at the I-605 interchange, causing a bottleneck.	• Investigate if restriping the general purpose lane to sustain four lanes throughout the interchange is possible. • Design in HOV ingress/egress weaving lanes.	• Improve traffic demand management.
91	EB	LA	R15.933	LA	R20.700	4.767	0.0	31.3	Evening	• The number of general purpose lanes drops from four lanes to three lanes at the I-605 interchange, causing a bottleneck.	• Investigate if restriping the general purpose lane to sustain four lanes throughout the interchange is possible. • Study the possibility of metering the connector ramps at the I-605 interchange.	• Increase capacity. • Improve traffic demand management.
91	WB	LA	R20.700	LA	R15.933	4.767	10.7	4.6	Morning	• The number of general purpose lanes drops from four lanes to three lanes at the I-605 interchange, causing a bottleneck.	• Investigate if restriping the general purpose lane to sustain four lanes throughout the interchange is possible. • Study the possibility of metering the connector ramps at the I-605 interchange.	• Increase capacity. • Improve traffic demand management.
91	WB	LA	R15.933	LA	R11.167	4.766	32.8	0.0	Morning	• The number of general purpose lanes drops from four to three at the I-710 interchange, causing a bottleneck..	• Investigate if restriping the general purpose lane to sustain four lanes throughout the interchange is possible.	• Increase capacity.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 23)												
105	EB	LA	R2.200	LA	R6.173	3.973	0.0	83.2	Evening	• General purpose lane drops after Prairie cause bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Investigate if restriping the general purpose lanes to sustain four lanes is possible. • Design in weave lanes at HOV access openings.	• Eliminate bottleneck. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
105	EB	LA	R6.173	LA	R10.145	3.972	21.4	89.3	Morning & Evening	• General purpose lane drops before Vermont cause bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Investigate if restriping the general purpose lanes to sustain four lanes is possible. • Design in weave lanes at HOV access openings.	• Eliminate bottleneck. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
105	EB	LA	R10.145	LA	R14.117	3.972	0.0	45.8	Evening	• Congestion in the general purpose lane. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• If possible have a minimum of four continuous general purpose lanes.	• Increase capacity.
105	EB	LA	R14.117	LA	R18.090	3.973	0.0	48.9	Evening	• This facility would benefit with an HOV direct connector. • The HOV traffic is pushed back into the general purpose lanes.	• Further study needed. Long term solution is to provide a HOV direct connector at I-710.	• Eliminate vehicle weaving conflict to merge across multiple general purpose lanes.
105	WB	LA	R10.145	LA	R6.172	3.973	71.0	1.5	Morning	• General purpose lane drops cause bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Investigate if restriping the general purpose lanes to sustain four lanes throughout is possible. • Design in weave lanes at HOV access openings.	• Eliminate bottleneck. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
118	EB	LA	R3.800	LA	R7.600	3.800	32.1	43.5	Morning & Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
118	EB	LA	R7.600	LA	R11.400	3.800	32.1	6.1	Morning	• The HOV lane terminates before the I-5 interchange. The HOV lane becomes the number one lane which then merges into the number two lane.	• Investigate if restriping the general purpose lanes to sustain four lanes throughout is possible.	• Increase capacity.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 24)												
118	WB	LA	R11.400	LA	R7.600	3.800	100.0	100.0	Morning & Evening	• Vehicle weaving conflict from southbound I-405 to the HOV lane. The southbound I-405 to the westbound SR-118 connector ramp needs to be investigated to study if truck volume and truck merging causes congestion. • Motorists travel speeds are too high to allow upstream traffic to adjust.	• Long term solution is to provide a HOV direct connector at the I-405 interchange to eliminate the HOV traffic weaving conflicts and allow more connector volume for trucks. • Coordinate with the CHP to increase speed enforcement.	• Improve traffic demand management.
134	EB	LA	0.000	LA	4.428	4.428	12.2	75.6	Morning & Evening	• Residual effect from the I-5 interchange. At this point, the HOV lane ends and there is a general purpose lane drop within the interchange curve. Since the HOV lane ends, HOV traffic quickly merges across the left lanes from southbound I-5 to merge back into the HOV lane on SR-134.	• Continue the HOV lane. Investigate if widening can occur to eliminate the lane drop within interchange. • Long term solution is to provide direct connectors at the I-5 interchange.	• Improve traffic demand management.
134	EB	LA	4.428	LA	R8.855	4.427	0.8	61.8	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
134	EB	LA	R8.855	LA	R13.283	4.428	1.5	43.5	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
134	WB	LA	R13.300	LA	R8.872	4.428	0.8	38.2	Evening	• Faulty vehicle detector system.	• Repair and update detector system to improve data collection.	• Properly operational vehicle detector system will ensure data accuracy.
134	WB	LA	R8.872	LA	4.428	4.427	2.3	38.2	Evening	• The HOV lane discontinues at the I-5 interchange. • There is a general purpose lane drop. • The curvature and condition of the pavement within the area of the merge of the connector from northbound I-5. • Vehicle weaving conflicts.	• Improve the interchange. • Long term solution is to provide direct connectors at the I-5 interchange.	• Improve traffic demand management.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 25)												
134	WB	LA	4.428	LA	0.000	4.428	0.0	13.7	Evening	• A complete squeeze of the SR-134 to US-101. Traffic volume at the interchange exceeds its capacity. Plus there is congestion on US-101.	• Improve the interchange.	• Improve traffic demand management.
170	NB	LA	R17.505	LA	R20.510	3.005	6.9	96.2	Evening	• The HOV lane ends. • There is a general purpose lane drop. • This interchange is currently under construction which includes an HOV direct connector to I-5.	• Defer action until construction is completed and traffic normalizes.	• Completion of HOV direct connector could improve conditions.
170	SB	LA	R17.505	LA	R14.500	3.005	58.0	0.8	Morning	• Congestion from the SR-170/US-101 interchange. • General purpose lane drops from four lanes down to two lanes. • The HOV lane ends. • Traffic volume exceeds capacity for vehicles heading on southbound US-101.	• Investigate if restriping the general purpose lanes to sustain a minimum of three lanes throughout the interchange is possible. Also, possible continuation of the HOV lane through the interchange. • Long term solution is improvements to the interchange.	• Eliminate bottlenecks.
210	EB	LA	R25.000	LA	L29.568	4.568	0.0	55.7	Evening	• General purpose lane drops at Molino and Rosemead causing congestion • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane. • Speeding drivers in both HOV and general purpose lanes do not allow the upstream traffic to adjust.	• Restripe if possible to eliminate at least one of the two lane drops. • Coordinate with the CHP to increase speed limit enforcement. • Design in weave lanes at HOV access openings.	• Eliminate bottleneck. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
210	EB	LA	L29.568	LA	R33.827	4.568	0.0	98.5	Evening	• Same as above.	• Same as above.	• Same as above.
210	EB	LA	R33.827	LA	R38.396	4.569	0.0	94.7	Evening	• Same as above.	• Same as above.	• Same as above.
210	EB	LA	R38.396	LA	R42.964	4.568	0.0	12.2	Evening	• General purpose lane drop at San Dimas combined with high volumes entering from SR-57 cause congestion. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Restripe if possible to eliminate the lane drop.	• Eliminate bottleneck.
210	EB	LA	R42.964	LA	R47.532	4.568	0.0	64.9	Evening	• Same as above.	• Same as above.	• Same as above.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 26)												
210	EB	LA	R47.532	LA	R52.100	4.568	100.0	33.6	Morning & Evening	• Same as above.	• Same as above.	• Same as above.
210	WB	LA	R38.395	LA	R33.827	4.568	56.5	14.5	Morning & Evening	• HOV traffic exits the HOV lane to merge onto I-605.	• Design in weave lanes at HOV access opening to serve I-605.	• Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
210	WB	LA	R33.827	LA	L29.568	4.568	40.5	38.9	Morning & Evening	• From the westbound Huntington Drive on-ramp there is an auxiliary lane that is striped like a fifth lane. This fifth lane only exists until 2nd Street. This causes confusion for motorists thinking that there is a fifth lane. Also it causes complications with the high truck volume.	• Restripe this on-ramp acceleration lane as an auxiliary lane.	• To avoid disruption with the traffic flow.
405	NB	LA	4.842	LA	9.861	4.843	10.7	0.8	Morning	• High vehicle volume from southbound I-710.	• Meter the connector ramp.	• Control platoons of vehicles entering the HOV lane.
405	NB	LA	9.861	LA	14.703	4.842	56.5	55.7	Morning & Evening	• General purpose lane drops prior to I-110. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Restripe if deemed possible to continue fourth lane. • Design in weave lanes at HOV access openings. Long term solution is a HOV direct connector at I-405/I-110 interchange.	• Eliminate bottleneck. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
405	NB	LA	14.703	LA	19.546	4.843	75.6	0.0	Morning	• HOV traffic exits the HOV lane to merge onto I-105.	• Design in weave lanes at HOV access opening to serve I-105. Long term solution may be a HOV direct connector at I-405/I-105 interchange.	• Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
405	NB	LA	19.546	LA	24.388	4.842	32.1	0.8	Morning	• General purpose lanes are congested. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Adjust ramp metering rates in this segment.	• Control platoons of vehicles entering the HOV lane.
405	NB	LA	24.388	LA	26.400	2.012	68.7	45.0	Morning & Evening	• Residual effect of ongoing upstream construction for the northbound HOV lane.	• Defer action until the HOV lane is completed.	• Completion of HOV lane will eliminate gap in system and could improve conditions.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

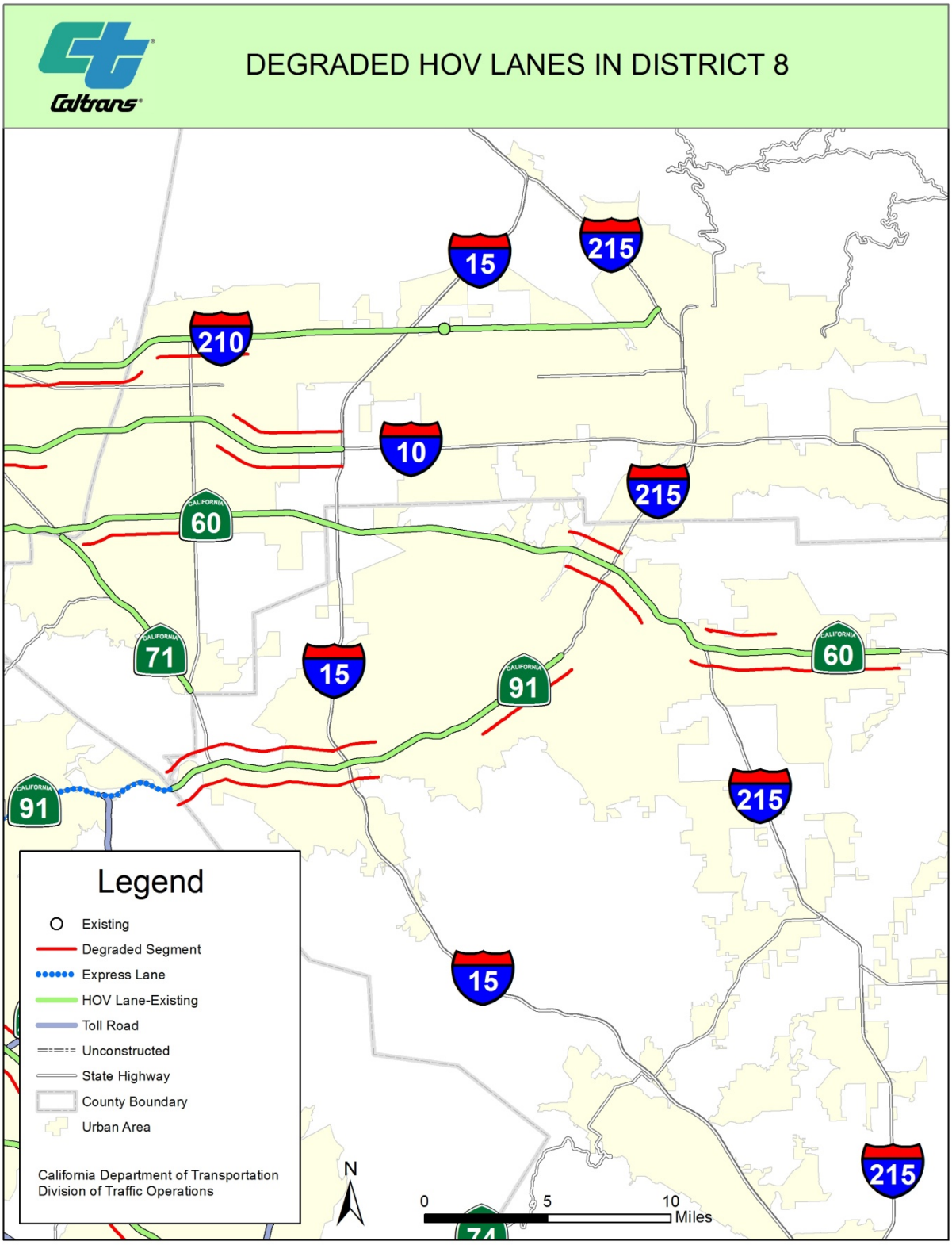
Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 27)												
405	NB	LA	38.600	LA	43.758	5.158	0.0	35.9	Evening	• General purpose lane drops at San Fernando Mission Rd and at the end of the HOV lane at I-5 creating bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Look into the possibility of restriping a fourth lane through segment.	• Eliminate bottleneck.
405	NB	LA	43.758	LA	48.600	4.842	0.0	28.2	Evening	• Same as above.	• Same as above.	• Same as above.
405	SB	LA	48.600	LA	43.758	4.842	13.0	7.6	Morning	• Unknown. Possibly faulty vehicle detection system.	• Review detector system to verify accurate data collection.	• Properly operational vehicle detector system will ensure data accuracy.
405	SB	LA	4.842	ORA	24.178	4.842	0.8	87.8	Evening	• • General purpose lanes are congested. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Defer action until improvements at I-605/I-405 interchange are completed.	• Completion of improvements at I-605 could improve conditions.
405	SB	LA	43.758	LA	38.915	4.843	95.4	12.2	Morning & Evening	• Slab replacement of the right three lanes approaching US-101. • Geometrics at the US-101 interchange cause congestion. Lane drop southbound at US-101 connector, queuing from US-101. Approaching US-101 interchange, the 2 right lanes are elephant tracked, leaving 3 general purpose lanes for southbound I-405. High demand from both directions of US-101 to southbound I-405 combined with weaving to Van Nuys off-ramp. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Slab rehab of the right 3 lanes approaching US-101. • Install delineators along the solid white line on the connector from SB US-101 to prevent premature weaving to the Van Nuys off-ramp. • Possible restripe of SB I-405 through interchange to give 4 general purpose lanes. • Design in weave lanes at HOV access openings. • Long term solution is additional improvements to US-101 interchange.	• Improvements are needed at the US-101 interchange due to high volumes and vehicle weaving conflicts. Residual effects from the congestion on US-101 also affect I-405.
405	SB	LA	38.915	LA	34.073	4.842	38.2	0.0	Morning	• General purpose lanes are congested. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Further study needed.	• Daily recurrent congestion due to high volumes and inadequate capacity. No room to make improvements on mainline.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 28)												
405	SB	LA	26.400	LA	24.388	2.012	0.0	36.6	Evening	• High vehicle volumes from SR-90.	• Meter the connector ramp from SR-90.	• Control platoons of vehicles entering the HOV lane.
405	SB	LA	24.388	LA	19.546	4.842	0.0	48.9	Evening	• Further study needed.	• Look into possibly metering the HOV lane at on-ramps.	• Control platoons of vehicles entering the HOV lane.
405	SB	LA	19.546	LA	14.703	4.843	10.7	53.4	Morning & Evening	• General purpose lane drops at I-110 and Avalon cause bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Investigate if restriping the general purpose lanes to sustain four lanes is possible. • Design in weave lanes at HOV access openings.	• Eliminate bottleneck • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
405	SB	LA	14.703	LA	9.861	4.842	0.0	63.4	Evening	• Further study needed.	• Further study needed.	• Needs further investigation.
405	SB	LA	9.861	LA	4.842	4.843	0.0	58.0	Evening	• General purpose lane drops at I-710 cause bottlenecks. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Investigate if restriping the general purpose lane to sustain four lanes is possible. • Design in weave lanes at HOV access openings.	• Eliminate bottleneck • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
605	NB	LA	R4.140	LA	R8.280	4.140	19.1	19.1	Morning & Evening	• General purpose lane drops at I-5 interchange cause bottlenecks. • High vehicle volume from I-5 causes congestion in the general purpose lanes. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Restripe if possible to eliminate the lane drop.	• Eliminate bottleneck.
605	NB	LA	R8.280	LA	R12.420	4.140	0.0	32.8	Evening	• Same as above.	• Same as above.	• Same as above.
605	NB	LA	R12.420	LA	R16.560	4.140	0.0	42.0	Evening	• Construction on I-10 east of I-605 affects I-10/I-605 interchange and this segment.	• Defer action until improvements on I-10 are completed.	• Completion of improvements at interchange could improve conditions.
605	SB	LA	R16.560	LA	R12.420	4.140	2.3	22.1	Evening	• Construction on I-10 east of I-605 affects I-10/I-605 interchange and this segment.	• Defer action until improvements on I-10 are completed.	• Completion of improvements at interchange could improve conditions.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 7

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 29)												
605	SB	LA	R12.420	LA	R8.280	4.140	4.6	42.0	Evening	• General purpose lane drops at I-5 interchange cause bottlenecks. • High vehicle volume from I-5 causes congestion in the general purpose lanes. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane.	• Restripe if possible to eliminate the lane drop.	• Eliminate bottleneck.


DEGRADED HOV LANES IN DISTRICT 8
Caltrans
15
215
210
10
215
60
71
15
91
60
91
215
15
215
Legend
Existing
Degraded Segment
Express Lane
HOV Lane-Existing
Toll Road
Unconstructed
State Highway
County Boundary
Urban Area
California Department of Transportation
Division of Traffic Operations
N
0
5
10
Miles

CALIFORNIA HIGH OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 8

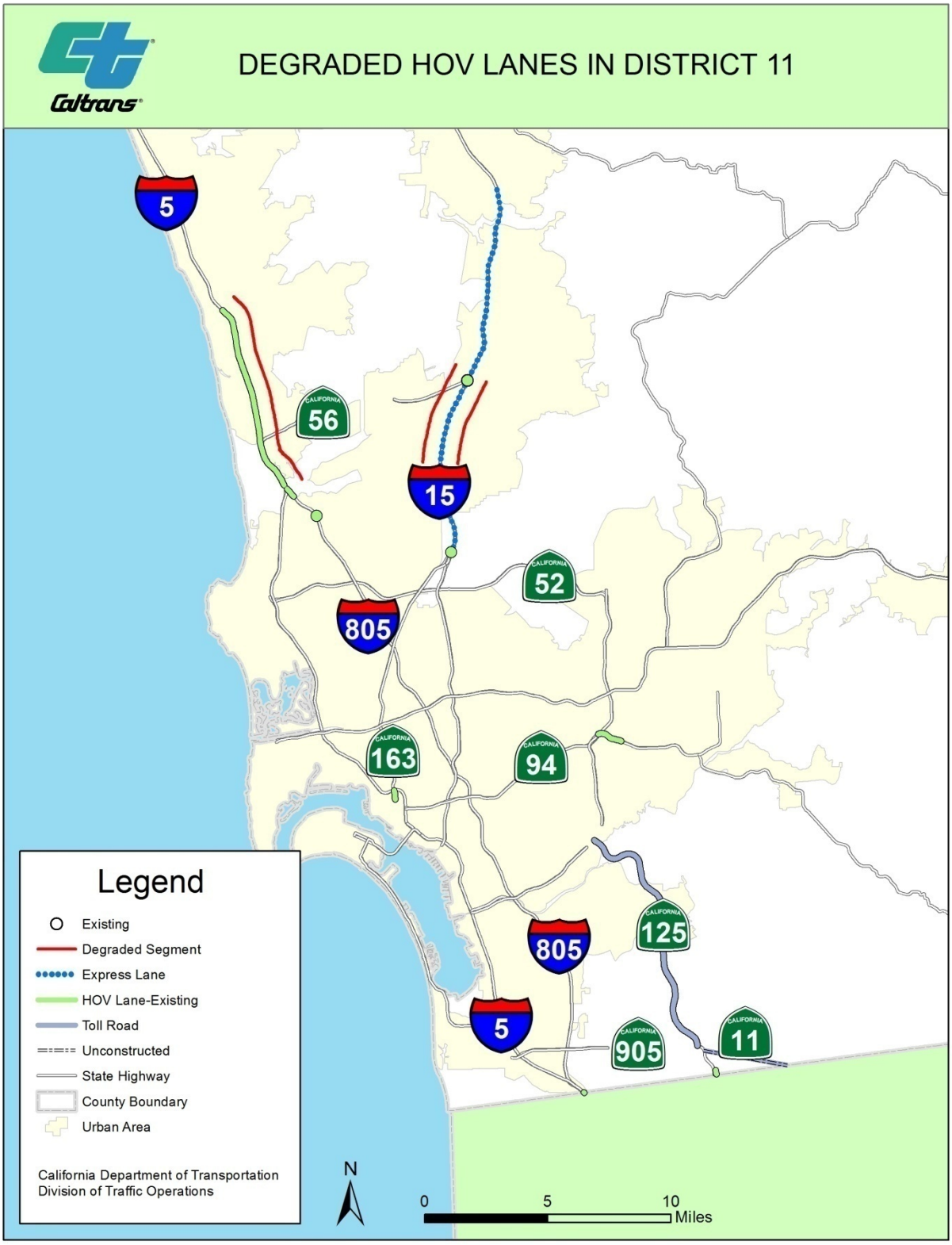
Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
10	EB	SBD	4.950	SBD	9.900	4.950	0.0	33.6	Evening	• HOV volume exceeds capacity. • HOV lane ends. • Increased traffic to and from Ontario Airport.	• Increase occupancy requirements. • Convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction July 2019 and end construction August 2024).	• Reduce HOV volume while maintaining the same level of person-throughput. • Increase capacity.
10	WB	SBD	9.900	SBD	4.950	4.950	4.6	32.1	Evening	• HOV volume exceeds capacity. • Congestion from Los Angeles County. • Increased traffic to and from Ontario Airport.	• Increase occupancy requirements. • Convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction July 2019 and end construction August 2024).	• Reduce HOV volume while maintaining the same level of person-throughput. • Increase capacity.
60	EB	LA	R30.456	SBD	R4.987	4.987	0.0	55.7	Evening	• HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/egress locations.	• Convert HOV lane from limited access to continuous access (begin construction March 2013 and end construction September 2013).	• Eliminate vehicle weaving conflicts at ingress/egress locations.
60	EB	RIV	10.266	RIV	15.413	4.988	0.0	12.2	Evening	• HOV volume exceeds capacity. • Gap in the HOV lane at the SR-60/I-215 east junction. • General purpose lanes are congested before the HOV lane ends.	• Construct an HOV lane in each direction to provide a continuous HOV lane from west to east of SR-60 and I-215 east junction (begin construction July 2011 and end construction March 2014).	• Close gap in HOV lane.
60	EB	RIV	15.413	RIV	20.400	4.987	0.0	29.0	Evening	• HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/egress locations.	• Convert HOV lane from limited access to continuous access (begin construction July 2011 and end construction November 2012).	• Eliminate vehicle weaving conflicts at ingress/egress locations.
60	WB	RIV	15.413	RIV	10.266	4.988	10.7	6.9	Morning	• HOV volume exceeds capacity. • Gap in the HOV lane at the SR-60/I-215 east junction. • General purpose lanes are congested before the HOV lane ends	• Construct an HOV lane in each direction to provide a continuous HOV lane from west to east of SR-60 and I-215 east junction (begin construction July 2011 and end construction March 2014).	• Close gap in HOV lane.

CALIFORNIA HIGH OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 8

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 32)												
91	EB	ORA	R18.905	RIV	4.266	4.378	0.8	91.6	Evening	• HOV volume exceeds capacity.	• Add a general purpose lane in each direction; convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction July 2013 and end construction July 2018). Increase occupancy from HOV-2 to HOT-3 as part of this project.	• Increase capacity.
91	EB	RIV	4.266	RIV	8.644	4.378	0.8	77.9	Evening	• HOV volume exceeds capacity.	• Add a general purpose lane in each direction; convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction July 2013 and end construction July 2018). Increase occupancy from HOV-2 to HOT-3 as part of this project.	• Increase capacity.
91	EB	RIV	13.022	RIV	17.400	4.378	52.7	5.3	Morning	• HOV volume exceeds capacity. • General purpose lanes are congested before the HOV lane ends.	• Add one HOV lane in each direction from Adam Street to SR-60/SR-91/I-215 interchange (begin construction March 2012 and end construction February 2016). • I-215 Bi-County HOV gap closure project adds one HOV lane in each direction from SR-60/SR-91/I-215 interchange to connect to existing HOV lane at Orange Show Road (begin construction February 2013 and end construction March 2016).	• Increase capacity. • Avoid vehicle weaving conflicts and provide a continuous HOV facility.
91	WB	RIV	8.644	RIV	4.266	4.378	74.0	26.0	Morning & Evening	• HOV volume exceeds capacity. • Increased traffic from I-15. • Insufficient Ingress/Egress locations.	• Add a general purpose lane in each direction; convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction July 2013 and end construction July 2018). Increase occupancy from HOV-2 to HOT-3 as part of this project.	• Increase capacity.

CALIFORNIA HIGH OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 8

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 33)												
91	WB	RIV	4.266	ORA	R18.905	4.378	10.7	0.8	Morning	• HOV volume exceeds capacity. • HOV-2 lane ends at this location and becomes a HOT-3 lane at Orange County line.	• Add a general purpose lane in each direction; convert existing HOV lane to a HOT lane and add a second HOT lane to operate as a dual lane facility (begin construction July 2013 and end construction July 2018). Increase occupancy from HOV-2 to HOT-3 as part of this project.	• Increase capacity. • Avoid vehicle weaving conflict and provide for continuous HOT lane operation.
210	EB	SBD	1.000	SBD	4.933	4.933	0.0	23.7	Evening	• HOV volume exceeds capacity. • High number of HOV violation.	• Coordinate with the CHP to increase enforcement on the HOV lane. • Establish Freeway Service Patrol along this route.	• Remove ineligible vehicles from the HOV lane. • Improve traffic demand management.
215	SB	RIV	43.300	RIV	40.646	2.654	1.5	79.4	Evening	• HOV volume exceeds capacity. • Gap in the HOV lane at the SR-60/I-215 east junction. • General purpose lanes are congested before the HOV lane ends.	• Construct an HOV lane in each direction to provide a continuous HOV lane from west to east of SR-60 and I-215 east junction (begin construction July 2011 and end construction March 2014).	• Close gap in HOV lane.


DEGRADED HOV LANES IN DISTRICT 11
5
56
15
52
805
163
94
805
125
5
905
11
Legend
Existing
Degraded Segment
Express Lane
HOV Lane-Existing
Toll Road
Unconstructed
State Highway
County Boundary
Urban Area
California Department of Transportation
Division of Traffic Operations
N
0
5
10
Miles

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 11

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
5	NB	SD	R30.700	SD	R34.600	3.900	0.0	46.6	Evening	• HOV volume exceeds capacity. • Existing HOV Lane ends by becoming the number one general purpose lane just south of Manchester Avenue.	• Current project development to extend the single northbound HOV lane an additional 13 miles from just south of Manchester Avenue to SR-78. Anticipated construction will begin in early 2015.	• Expand the HOV network.
5	NB	SD	R34.600	SD	R38.500	3.900	0.8	59.5	Evening	• HOV volume exceeds capacity. • Existing HOV Lane ends by becoming the number one general purpose lane just south of Manchester Avenue.	• Current project development to extend the single northbound HOV lane an additional 13 miles from just south of Manchester Avenue to SR-78. Anticipated construction will begin in early 2015.	• Expand the HOV network.
15	NB	SD	M15.900	SD	M19.800	3.900	No data	21.4	Evening	• Portions of the I-15 Managed Lanes were under construction, which caused the degradation. • Faulty vehicle detector system. Segment may not be properly coded into the system.	• I-15 Managed Lanes was completed on January 17, 2012. It is now fully operational. Defer any action pending further evaluation now that construction is completed. • Update detector system to improve data collection.	• Disruption for the traveling public resulting from the construction activities.
15	SB	SD	M19.800	SD	M15.900	3.900	37.4	No data	Morning	• Portions of the I-15 Managed Lanes were under construction, which caused the degradation. • Faulty vehicle detector system. Segment may not be properly coded into the system.	• I-15 Managed Lanes was completed on January 17, 2012. It is now fully operational. Defer any action pending further evaluation now that construction is completed. • Update detector system to improve data collection.	• Disruption for the traveling public resulting from the construction activities.


DEGRADED HOV LANES IN DISTRICT 12
Caltrans
710
605
5
57
71
15
91
241
22
261
405
133
241
73
1
5
ORANGE
Legend
Existing
Degraded Segment
Express Lane
HOV Lane-Existing
Toll Road
Unconstructed
State Highway
County Boundary
Urban Area
California Department of Transportation
Division of Traffic Operations
N
0
5
10
Miles

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
5	NB	ORA	20.497	ORA	R25.097	4.600	20.6	38.2	Morning & Evening	• Congestion in general purpose lanes. Major bottlenecks occurring at Sand Canyon Rd. and Jeffrey Rd. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflict between the two HOV lanes just north of Barranca Pkwy. • Vehicle weaving conflicts due to insufficient ingress/egress locations at Sand Canyon Rd.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Complete direct access ramps on Barranca Pkwy. • Proposed project will convert existing buffer-separated HOV facility to continuous access striping to eliminate weaving maneuver at ingress/egress locations. Construction completion 12/2017.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
5	NB	ORA	R25.097	ORA	29.703	4.599	47.3	84.7	Morning & Evening	• Congestion in general purpose lanes. Merging problem occurring at Tustin Ranch Rd due to no shoulder and non-standard lane width. Bottleneck occurring SR-55 on general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity • Vehicle weaving conflicts due to insufficient ingress/egress locations. • HOV violations.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT. Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added • Proposed project will convert existing buffer-separated HOV facility to continuous access striping to eliminate weaving maneuver at ingress/egress locations. Construction completion 12/2017. • Long term solution could be direct access ramps at select locations.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 39)												
5	NB	ORA	29.703	ORA	34.302	4.599	0.0	91.6	Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • HOV violations.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Proposed project will add a second HOV lane between SR-55 and SR-57 to provide a dual lane facility. PA & ED phase completion 11/2013. Construction completion 02/2019.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
5	SB	ORA	38.901	ORA	34.302	4.599	46.6	2.3	Morning	• Vehicle weaving conflict at ingress/egress locations. • Bottleneck occurring at merge of direct connector from SB SR-57 HOV lane.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Proposed project will convert existing buffer-separated HOV facility to continuous access striping to eliminate weaving maneuver at ingress/egress locations. Construction completion date is 12/2017. • Proposed project will add a second HOV lane between SR-55 and SR-57 to provide a dual lane facility. PA & ED phase completion 11/2013. Construction completion 02/2019.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 40)												
5	SB	ORA	34.302	ORA	29.703	4.599	36.6	22.9	Morning & Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Merging problem occurring at HOV direct access ramp at Grand Avenue. • Geometric bottleneck occurring at SR-55 HOV direct connector diverge.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Proposed project will convert existing buffer-separated HOV facility to continuous access striping to eliminate weaving maneuver at ingress/egress locations. Construction completion 12/2017. • Proposed project will add a second HOV lane between SR-55 and SR-57 to provide a dual lane facility. PA & ED completion in 11/2013. Construction completion 02/2019. • Extend merge striping further south. Add flashing warning signs to alert drivers of potential standing queues during morning peak hours on SB SR-57 and SB I-5 prior to the merging point (minor improvement).	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
5	SB	ORA	29.703	ORA	R25.096	4.600	13.7	10.7	Morning & Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflict at ingress/egress locations at SR-55, Red Hill Ave., Tustin Ranch Rd., Jamboree Rd. and Culver Dr. • Faulty vehicle detector system due to construction activity.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Proposed project will convert existing HOV buffer separated access to continuous access to eliminate weaving maneuver at the ingress/egress. Construction completion 12/2017. • Long term solution could be direct access ramps at select locations.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 41)												
5	SB	ORA	20.497	ORA	15.898	4.599	0.0	16.0	Evening	• Congestion in general purpose lanes. Bottleneck occurring at El Toro Rd, Alicia Pkwy and Oso Pkwy. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/egress at Alicia Pkwy, North of La Paz Rd and North of Oso Pkwy. • Construction activity at La Paz Interchange was just finished.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Proposed project will convert existing HOV buffer separated access to continuous access to eliminate weaving maneuver at the ingress/egress. • Proposed project will extend second HOV lane in both directions between El Toro Rd. and Alicia Pkwy. PA & ED phase will be completed in 07/2014. Construction completion date is 12/2023. • Long term solution is to add HOV direct access ramp at Los Alisos Blvd.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
5	SB	ORA	11.299	ORA	6.700	4.599	18.3	19.8	Morning & Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/egress at Tustin Ranch Rd., Jamboree Rd. and Culver Dr. • Faulty vehicle detector system.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Proposed project will convert existing HOV buffer separated access to continuous access to eliminate weaving maneuver at the ingress/egress. • Long term solution could be direct access ramps at select locations.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 42)												
55	NB	ORA	R6.000	ORA	R9.761	3.761	0.8	48.9	Evening	• Congestion in general purpose lanes. Major bottleneck occurring at Dyer Rd. on-ramp. Another bottleneck occurring in the general purpose lanes due to the lane drop upstream of the connector from SB I-405. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Faulty vehicle detector system due to construction activity.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Add HOV direct access ramps at Alton Ave. • Proposed lane addition project between I-405 and I-5. If HOV lane capacity is increased, degradation will be addressed. PA & ED phase will be completed in 02/2014. Construction completion date is 01/2024.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
55	NB	ORA	R9.761	ORA	13.539	3.760	0.0	27.5	Evening	• Congestion in general purpose lanes. Bottlenecks include the 17th St. on-ramp due to congested slow speeds in the adjacent mainline lane and SR-22 traffic weaving out of the HOV lane. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Bottlenecks occurring in the HOV lane due to diverge at connector to northbound I-5 and pinch point under I-5 with zero shoulder.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Long term solution could be direct connectors at SR-22 interchange (recommend to increase capacity & eliminate bottleneck).	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
55	SB	ORA	17.300	ORA	13.539	3.761	58.0	2.3	Morning	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity • High HOV violations.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Long term solution could be direct access ramps at select locations.	• Increase capacity • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 43)												
55	SB	ORA	13.539	ORA	R9.761	3.760	18.3	3.1	Morning	• Congestion in general purpose lanes. Major bottleneck occurring at 17th St. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Merging problem occurring at the HOV direct connector from southbound I-5.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Long term solution could be direct connectors at SR-22 interchange (recommend to increase capacity & eliminate bottleneck).	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
57	NB	ORA	14.700	ORA	18.600	3.900	29.0	29.0	Morning & Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Bottleneck occurring at Orangethorpe Ave. and the SR-91 interchange due to merging problem SR-91 HOV direct connector. • Construction activities due to ongoing freeway widening project.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Long term solution could be direct access ramps at select locations.	• Increase capacity • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
57	NB	ORA	18.600	ORA	R22.500	3.900	0.0	51.9	Evening	• Congestion in general purpose lanes. Long climbing grade. Lane drop at Imperial Hwy. Geometric constraints on the horizontal curve. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Construction activities. • HOV violations.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added.	• Increase capacity.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 44)												
57	SB	ORA	R22.500	ORA	18.600	3.900	46.6	4.6	Morning	• Congestion in general purpose lanes due to geometric constraints (vertical curve from LA county line to south of Lambert Rd. UC & horizontal curve at Imperial Hwy interchange). When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Construction activities.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added.	• Increase capacity.
57	SB	ORA	14.700	ORA	10.800	3.900	40.5	16.0	Morning & Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Bottleneck occurring from HOV direct connector merging onto SB I-5 from SB SR-57. Non-standard left shoulder width.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Long term solution could be direct access ramps to/from Cerritos Ave.	• Increase capacity.
91	WB	ORA	R9.870	ORA	5.356	4.514	0.8	10.7	Evening	• Congestion in general purpose lanes. Major bottlenecks occurring at Lakeview Ave. and State College Blvd. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added.	• Increase capacity.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 45)												
91	WB	ORA	5.356	ORA	0.841	4.515	1.5	16.0	Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Bottleneck occurring at State College Blvd. due to merging problem from SB SR-57 HOV direct connector.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added.	• Increase capacity.
91	WB	ORA	0.841	LA	R20.741	4.515	5.3	40.5	Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • HOV lane drop downstream of direct connector from I-5.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added.	• Increase capacity.
405	NB	ORA	5.080	ORA	9.929	4.849	0.8	36.6	Morning & Evening	• HOV volume exceeds capacity. • Faulty vehicle detector system. • Construction activity (0L060)	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Add HOV direct access ramps to/from Von Karman Ave and Bear St. • Add HOV direct connector at SR-73 (recommend to increase capacity & eliminate bottleneck).	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 46)												
405	NB	ORA	9.929	ORA	14.779	4.850	0.0	87.0	Evening	• Congestion in general purpose lanes due to bottleneck occurring at SR-55 interchange and lane drop at Euclid St. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient egress to Fairview Dr. • HOV violations.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Add HOV direct access ramps to/from Bear St • Add HOV direct connector at SR-73 (recommend to increase capacity & eliminate bottleneck). • A proposed widening project in both directions on I-405 between SR-73 and I-605 includes an alternative that adds HOV capacity and converts existing and new HOV lanes to HOT. PA&ED Phase completion 12/2014.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
405	NB	ORA	14.779	ORA	19.628	4.849	14.5	67.9	Morning & Evening	• Congestion in general purpose lanes due to bottleneck occurring at SR-22 interchange. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/ • Construction activity at SR-22 interchange.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Add HOV direct access ramps in the vicinity between Beach Blvd. and Bolsa Ave. • A proposed widening project in both directions on I-405 between SR-73 and I-605 includes an alternative that adds HOV capacity and converts existing and new HOV lanes to HOT. PA&ED Phase completion 12/2014.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.

CALIFORNIA HIGH-OCCUPANCY VEHICLE LANE DEGRADATION ACTION PLAN
STRATEGIES FOR DISTRICT 12

Route	Direction	Begin County	Begin Postmile	End County	End Postmile	Length (Miles)	Degradation Level			Potential Cause(s)	Remediation Strategies	Reasons for Strategies
							Morning (% Days Degraded)	Evening (% Days Degraded)	Peak Period Degraded			
(Continued from page 47)												
405	SB	ORA	19.628	ORA	14.779	4.849	38.9	17.6	Morning & Evening	• Congestion in general purpose lanes. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential • HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/egress at Edward St., McFadden Ave. and Magnolia St • Construction activity at SR-22 interchange.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Add HOV direct access ramps in the vicinity between Beach Blvd. and Bolsa Ave. • A proposed widening project in both directions on I-405 between SR-73 and I-605 includes an alternative that adds HOV capacity and converts existing and new HOV lanes to HOT. PA&ED Phase completion 12/2014.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.
405	SB	ORA	9.929	ORA	5.080	4.849	20.6	93.1	Morning & Evening	• Congestion in general purpose lanes. General purpose lane bottleneck occurring at Culver Dr. Geometric bottleneck occurring at SR-55 interchange. When general purpose lanes are congested this results in weaving conflict at ingress/egress location and congests the HOV lane due to the speed differential. • HOV volume exceeds capacity. • Vehicle weaving conflicts due to insufficient ingress/egress • High HOV violations.	• Further study needed. Options include adding second HOV lane, HOV weaving lane, or adding second lane and converting both to HOT, Increasing occupancy may be considered if converted to HOT and additional general purpose lanes are added. • Add HOV direct access ramps to/from Von Karman Ave.	• Increase capacity. • Minimize queuing in HOV lanes due to congestion in general purpose lanes at access openings.