

CALIFORNIA DEPARTMENT OF TRANSPORTATION



**2013 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**

December 12, 2014



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INTRODUCTION

As required under title 23, United States Code, section 166(d), the California Department of Transportation (Caltrans) has developed the “2013 California High-Occupancy Vehicle Lane Degradation Action Plan” which identifies strategies for addressing degraded High-Occupancy Vehicle (HOV) lanes. Table 1 summarizes degradation on the monitored HOV lane segments in the 2013 calendar year as reported in the “2013 California High-Occupancy Vehicle Lane Degradation Determination Report.”

Table 1		
2013 STATEWIDE HOV LANE DEGRADATION SUMMARY		
	First 180-Day Period January to June 2013	Second 180-Day Period July to December 2013
Degraded	54% (712 lane-miles)	59% (788 lane-miles)
Not Degraded	46% (614 lane-miles)	41% (538 lane-miles)
Total	100% (1,326 lane-miles)	100% (1,326 lane-miles)

Because past traffic trends typically show more degradation in the second half of the year than the first half, Caltrans and the Federal Highway Administration (FHWA) agreed that the action plan would address only the degraded facilities identified in the second half of 2013. Statewide degradation increased from 759 lane-miles to 788 lane-miles between the second halves of 2012 and 2013, respectively. This trend is consistent with the 16 percent increase in vehicle hours of delay on the entire State Highway System during the same period. This action plan was developed by Caltrans based on the review of the traffic data and field conditions and in consultation with staff from the FHWA.

ACTION PLAN DESCRIPTION

A map of HOV lanes in each district is provided with the degraded segments shown. Degraded segments along the same route are grouped together into corridors for easier reference. The corridors may include minor gaps of non-degraded segments in them. The action plan for each district's degraded corridors is provided after each map. The action plan identifies the potential causes of degradation, remediation strategies, and reasons for the strategies. Caltrans proposes a combination 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 coordinate with the California Highway Patrol (CHP) to increase HOV enforcement in order to remove ineligible vehicles from the lane and lower the violation rates.
- **Improved Incident Response Times:** The Freeway Service Patrol (FSP) is a program provided under a partnership between Caltrans, the CHP, and regional transportation agencies. The FSP program comprises of privately owned tow truck operators that patrol designated routes on California's congested urban freeways during peak commute periods. They provide free assistance to stranded motorists and remove disabled vehicles from the freeway to minimize traffic disruption and prevent nonrecurring congestion. Presently, the FSP's goal is to respond to incidents within ten 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 continues to work to improve FSP response time.
- **Improved Detection:** A review of the data shows that the vehicle detectors at certain locations are working approximately 50 to 60 percent of the time. The detection systems should be operating at least 70 percent of the time. The districts continue efforts to repair existing vehicle detectors to improve monitoring performance. Additionally, some detection equipment was miscoded and was reporting data for incorrect lanes. The detection system is continually improved and recalibrated.
- **Improved Infrastructure:** Various short-term and long-term HOV infrastructure improvements are planned to mitigate 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 2013 or will begin construction within the next one to three years. Caltrans proposes to defer actions on the degraded segments near these projects until the improvements are completed and further analysis can be performed.

Other proposed infrastructure improvements focus on improving HOV lane performance by reduction of congestion in general purpose lanes. When general-purpose lanes are congested, lane-changing maneuvers made into and out of a carpool lane may become disruptive and diminish HOV lane speeds.¹ The reduction in HOV lane speed leads to degradation. Action item proposals for the general purpose lanes include improvements to bottlenecks, weaving sections, and auxiliary lanes. Some proposals such as new general-purpose lanes add capacity to the highway to improve operations on the HOV lanes.

These improvements were underway in 2013 and continue through future years. Caltrans proposes to defer action on these degraded segments until the improvements are fully completed and further analysis can be performed. In the case of long-term projects, such as those exceeding three years construction time, Caltrans also proposes deferral of the operational evaluation until full construction completion to allow traffic to normalize. Long-term construction projects implement multiple traffic stages or detours, some lasting six months or less, that preclude traffic pattern normalization until after full project completion.

- **Strategies for Active Traffic Management:** Caltrans proposes various active traffic management strategies to mitigate congestion on freeways in some districts. These strategies include on-ramp and freeway connector ramp metering, and speed harmonization. Speed harmonization varies speed limits to optimize traffic flow and reduce stop-and-go conditions. In other locations, HOV lanes will be converted to High-Occupancy Toll (HOT) lanes within the next three to five years; these improvements would result in improved vehicle detection, motorist compliance, and in some cases, improved throughput.

Caltrans, in the future, could consider increasing minimum occupancy of select HOV lanes to mitigate degradation. However, the impact to the HOV lanes and general-purpose lanes would require thorough examination. Comprehensive operational analyses would need to be conducted to determine the full effects of increasing occupancy on a proposed corridor. Such studies would consider the geographic, geometric, and traffic demand characteristics of both the individual highway corridor and the region. In some locations, the studies may show that occupancy increases could decrease throughput of HOV lanes due to two-person occupancy vehicles diverting to general-purpose lanes without increases in three-person occupancy vehicles using HOVs. In order to minimize these impacts, increasing occupancy requirements could be supplemented with conversion of HOV lanes to HOT lanes. HOT lanes allow drivers not meeting occupancy requirements to utilize the facilities by paying a variably priced toll based on the existing demand.

¹ Jang, Ki Tae. (2011). Traffic Interactions in Freeways with Carpool Lanes. UC Berkeley: Civil and Environmental Engineering



At this time, Caltrans is not considering prohibiting exempted vehicles such as ILEVs from the HOV lanes. The connection between exempted vehicles and degradation has yet to be established. Traffic counts indicate that exempted vehicles contribute a relatively small percentage of the peak hour HOV volume and are dispersed throughout the HOV network statewide. District 7, with the highest number of exempted vehicle registration, recorded exempted vehicles on almost all the HOV lanes studied. Throughout District 7, exempted vehicles averaged less than 1 percent of peak HOV volume. On individual freeway routes, exempted vehicles constitute up to 5 percent of the peak HOV traffic. Route 99 in District 3 has consistent degradation yearly, but exempted vehicles represent only 2 percent of its peak hour HOV volume.

Caltrans has a statewide Managed Lanes Manager to serve as Caltrans' primary point of contact for issues related to Managed Lanes. The manager works with the districts, other Caltrans divisions, 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 system investment.

Table 2	
STATEWIDE SELECTION OF MAJOR ACTION PLAN PROPOSALS	
District 3	
Route 80 WB & EB	Partner with Placer County to construct auxiliary lanes to ease congestion and improve average vehicle speeds in all lanes: westbound between Riverside Ave. and Douglas Blvd and eastbound between Route 65 to Rocklin Road. Both projects are programmed in the Metropolitan Transportation Improvement Program (MTIP). Construction is anticipated to begin in 2017 and completed in 2019. Preliminary project cost is \$6.0 million for the EB auxiliary lane and \$2.5 million for the WB auxiliary lane.
District 4	
Districtwide	Coordinate with the CHP to increase enforcement on HOV lanes. An agreement was reached between District 4 and CHP on March 25, 2014 to increase enforcement of the HOV lanes. Enforcement priority being the extremely degraded segments, followed by very degraded, and slightly degraded segments. Analysis recommended after one year of implementation to assess districtwide effects.
Route 80 EB & WB	Integrated Corridor Mobility project including active traffic management (e.g.: variable speed limits) and ramp metering along I-80 corridor. Began construction on October 2011 and end construction on January 2015). Preliminary project cost is estimated at \$80 million and is funded from the Corridor Mobility Improvement Account (CMIA).
Route 580 EB	Convert an existing HOV lane to an express lane and add a second express lane to operate as a dual lane facility (begin construction fall 2014 and end construction spring 2015). Project limits are from Hacienda Dr. to Greenville Rd. Preliminary project cost is estimated at \$20 million and would be funded by the Alameda County Transportation Commission.



Table 2	
STATEWIDE SELECTION OF MAJOR ACTION PLAN PROPOSALS	
Route 880 NB & SB	Convert an HOV lane to express lane (begin construction March 2015, and end construction January 2016). Project limits are from 66th Avenue in Oakland (including new HOV lane extension that will be converted to express lane) to Route 237. Preliminary project cost is estimated at \$66 million and would be funded by Metropolitan Transportation Commission.
Route 101 NB & SB	Convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (begin construction in 2016 and end construction fall 2017). Project limits from East Dunne Avenue to Oregon Expressway/Embarcadero Road Project will convert the existing HOV lane into express lane and construct a second express lane between Cochrane Road to Route 85 (San Jose) and from Blossom Hill Road to Mathilda Avenue in both the northbound and southbound direction. Preliminary project cost is estimated at \$416 million and would be funded by Santa Clara Valley Transportation Authority through design stage of the project.
Route 101 SB	Add a lane between Story Road interchange and Yerba Buena interchange. Modify Tully interchange (began construction November 2010, and end construction October 2012) and Capitol Expressway interchange (began construction August 2012, and end construction December 2014).
District 7	
Route 10 EB & WB Route 110 NB & SB	Partner with LA metro to study the following strategies for implementation within six months: adjust congestion pricing algorithm, implement vehicle occupancy violation video detection, increase of occupancy requirements, remove current limits on toll rates, and eliminate HOV ingress/egress locations.
Route 10 EB & WB	Route 10 and Route 605 Interchange Improvement Project is currently under construction, and will complete in 2017. Project cost is \$62.5 million.
Route 405 SB	The southbound HOV lane from Route 10 to Route 101 will be completed in 2014. HOV lane is open but ramp meters are not yet fully operational. Some adjustments to ingress/egress locations and installation of loop to be completed.
Route 170 NB	Route 5/Route 170 HOV direct connector is currently under construction with completion planned for 2016.
Route 57 NB	Construction of the Route 57/Route 60 Interchange improvement project to be completed in 2017. Study area when traffic normalizes after completion of construction.
District 8	
Route 215 NB & SB	Construct an HOV lane in each direction on Route 215 with the Bi-County HOV Project. Add HOV lane widening on Route 91 directly south of of Route 215. Completed project provides continuous HOV lanes to the north, west, and south. Project cost estimate is \$193.2 million. Construction began in February 2013 and completion expected in March 2016. The Route 91 HOV Widening Project cost estimate is \$225.4 million. Construction began in March 2012 and completion is planned in February 2016. Both projects are funded by STIP and local funds.



Table 2	
STATEWIDE SELECTION OF MAJOR ACTION PLAN PROPOSALS	
Route 60 EB & WB	HOV lane gap-closure project will maintain the continuity of continuous access HOV lane at the Route 60/Route 215 East Junction. Construction began in May 2011 and planned completion is in December 2014. The project would improve the traffic flow on the HOV and general purpose lanes. Project cost is estimated at \$36.5 million and is funded by STIP and local funds. Effects of improvement will be monitored using PeMS information, HOV occupancy counts, field observations, and public response.
Route 91 EB & WB	Add a general purpose lane in each direction from Route 71 to Main Street. Convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility. Construction began in July 2013 and completion expected in July 2018. Project cost is estimated at \$1.35 billion and is funded by STIP, Local Funds, and State-Local Partnership Program Bonds (SLPP).
District 11	
Route 5 NB & SB	Extend the northbound HOV lane nine miles from Manchester Avenue to Palomar Airport Road, provide a direct access ramp at Manchester Avenue, construct a southbound auxiliary lane between Santa Fe Drive and Birmingham Drive, and construct auxiliary lanes in both directions between Poinsettia Lane and Palomar Airport Road. Construction planned for the fall of 2015 with completion in 2017. Currently, the HOV lane ends at a location that experiences recurrent congestion. Extension of the lane through the congested segment and the major interchange at Palomar Airport Road should improve degradation.
Route 15 NB & SB	Construct Hillery Drive direct access ramps to I-15 express lanes. Construction completion scheduled for late 2014. Project is estimated at \$25.3 million and is funded by Transnet and local tax measures.
District 12	
Districtwide	Develop Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane, and HOV direct access ramps. The study will be completed in June 2015.
Route 5 NB & SB	Reconstruct the Route 74/Route 5 interchange. Construction will begin in September 2016, and complete in September 2017. Project cost is estimated at \$67.6 million and is funded by State Transportation Improvement Program, Regional Improvement Program, and Measure M2.
Route 57 SB	The three projects include converting southbound HOV lane to continuous access. These three projects have an estimated total cost of \$143M and are funded by CMA and Measure M. Construction started in December 2010 and full completion expected by March 2015. HOV continuous access would reduce weaving conflicts and allow lane changes between the HOV lane and the adjacent general purpose lane over a greater distance with more time.
Route 91 EB & WB	The project includes converting buffer-separated HOV lane to continuous access. Construction started in May 2012 and completed in August 2014. Project cost is estimated at \$28.6M.

Figure 1

**DISTRICT 3 DEGRADED HOV LANES
JULY 1 TO DECEMBER 31, 2013**

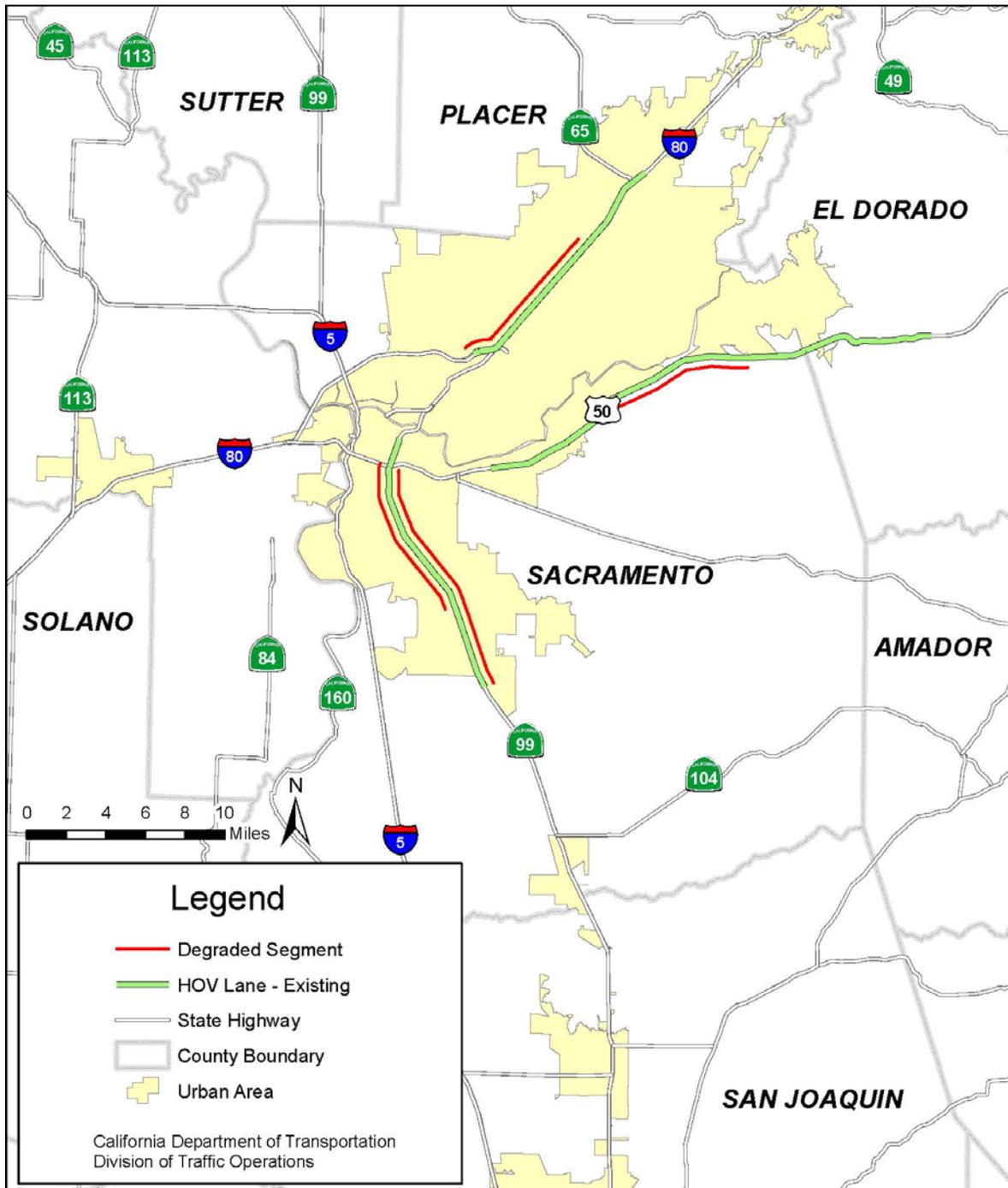


Table 3

DISTRICT 3 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
3	50 EB	SAC 12.500	SAC 20.123	2	<ul style="list-style-type: none"> • High HOV violation rates. • Non-recurrent congestions, such as collisions, weather, and construction reduce operating speed. • A lane drop from four lanes to three lanes occurs on eastbound Route 50 at Folsom Boulevard. The weaving section causes speed degradation in all lanes. • High PM peak hour congestion in all lanes, including the HOV lane, reduces HOV lane performance and speeds. • Issues with the vehicle detector system such as communication and power disruptions. • Rapid population growth in the suburban cities of Folsom and El Dorado Hills has increased traffic volumes and congestion on all lanes on Route 50. 	<ul style="list-style-type: none"> • District 3 established a partnership with the CHP to increase enforcement on the HOV lanes. District 3 and local CHP office are applying for an Office of Traffic Safety (OTS) funding grant. The grant schedule calls for a submittal to the OTS in May 2014. District 3 originated the grant request by arranging a meeting with CHP in November 2013. The grant request includes funding for before and after studies of HOV lane mobility. HOV lane speeds will also be monitored during the enforcement period. An estimated \$1.18 million was requested for costs which include additional personnel cost, enforcement overtime hours, and public education materials. • Reduce ramp metering release rates. The process has already begun and is scheduled to be completed for all ramp meters in the Sacramento metropolitan area by December 2014. Before and after studies for this strategy are planned. • Improve the response time for the FSP. Current average response time is ten minutes. Discussions are continuing with District and CHP to reduce the response time. Implementation schedule for reducing the response time depends on increasing FSP training, increasing FSP tow truck numbers, and increasing FSP certification. Schedule for these processes are estimated to be one year. • Repair and update vehicle detector system to improve data collection. Current project (EA 3F840) to repair and update existing vehicle detection systems is in project development process and is about 40 percent completed. The PA&ED will be in January 2015. It will be Ready To List by December 2016, and it will be completed by October 2017. 	<ul style="list-style-type: none"> • Remove ineligible vehicles from the HOV lane. • Improve traffic demand management. • Properly operating vehicle detector system will ensure data accuracy.

Table 3

DISTRICT 3 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
3	80 WB	PLA 0.000	SAC M9.400	2	<ul style="list-style-type: none"> High HOV violation rates. Non-recurrent congestion, such as collisions, weather, and construction activities reduce operating speed. Demand exceeds capacity in general purpose lanes and reduces speeds. Slower general purpose lane speeds impact HOV lane speed. Geometric constraints such as arrow lane and shoulder width may result in reduced traffic speeds. Vehicle weaving at the downtown corridor splits may reduce speeds in all lanes. Rapid population growth in the suburban cities of Roseville and Rocklin has increased traffic volumes and congestion on all lanes on Route 80. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> District 3 is partnering with Placer County to construct a westbound auxiliary lane between Riverside Avenue and Douglas Boulevard to ease congestion and improve average vehicle speeds in all lanes. A project on eastbound Route 80 proposes an auxiliary lane from Route 65 to Rocklin Road. Both projects are programmed in the Metropolitan Transportation Improvement Program (MTIP). A majority of the funding has been secured. Placer County Transportation Planning Agency is actively working to secure the remaining funds for construction. Construction will begin in 2017 and complete in 2019. Preliminary project cost for the eastbound auxiliary lane is \$6 million and for the westbound auxiliary lane is \$2.5 million. District 3 established a partnership with the CHP to increase enforcement on the HOV lanes. District 3 and local CHP office are applying for an Office of Traffic Safety (OTS) funding grant. The grant schedule calls for a submittal to the OTS in May 2014. District 3 originated the grant request by arranging a meeting with CHP in November 2013. The grant request includes funding for before and after studies of HOV lane mobility. HOV lane speed will also be monitored during the enforcement period. An estimated \$1.18 million was requested for costs which include additional personnel costs, enforcement overtime hours, and public education materials. Reduce ramp metering release rates. The process has already begun and is scheduled to be completed for all ramp meters in the Sacramento metropolitan area by December 2014. Before and after studies for this strategy are planned. Improve the response time for the FSP. Current average response time is ten minutes. Discussions are continuing with district and CHP to reduce the response time. Implementation schedule for reducing the response time depends on increasing FSP training, increasing FSP tow truck numbers, and increasing FSP certification. Schedule for these processes are estimated to be one year. Repair and update vehicle detector system to improve data collection. Current project (EA 3F840) to repair and update existing vehicle detection systems is in project development process and is about 40 percent completed. The PA&ED will be in January 2015. It will be Ready To List (RTL) by December 2016, and it will be completed by October 2017. 	<ul style="list-style-type: none"> Improve traffic demand management. Remove ineligible vehicles from the HOV lane. Properly operating vehicle detector system will ensure data accuracy.

Table 3

DISTRICT 3 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
3	99 NB	SAC 11.900	SAC R24.300	2	<ul style="list-style-type: none"> • High HOV violation rates. • Demand exceeds capacity in general purpose lanes and reduces speeds. Slower general purpose lane speeds impact HOV lane speed. • Non-recurrent congestion, such as collisions, weather, and construction increase the degradation percentage. • Geometric constraints such as narrow lane and shoulder width from Route 50 to Fruitridge Road result in reduced traffic speeds. • Vehicle weaving at the Route 50 interchange causes reduced speeds in all lanes. • Issues with the vehicle detector system such as communication and power disruptions. • Rapid population growth in the suburban city of Elk Grove has increased traffic volumes and congestion on all lanes on Route 99. 	<ul style="list-style-type: none"> • District 3 established a partnership with the CHP to increase enforcement on the HOV lanes. District 3 and local CHP office are applying for an Office of Traffic Safety (OTS) funding grant. The grant schedule calls for a submittal to the OTS in May 2014. District 3 originated the grant request by arranging a meeting with CHP in November 2013. The grant request includes funding for before and after studies of HOV lane mobility. HOV lane speeds will also be monitored during the enforcement period. An estimated \$1.18 million was requested for costs which include additional personnel cost, enforcement overtime hours, and public education materials. • Reduce ramp metering release rates. The process has already begun and is scheduled to be completed for all ramp meters in the Sacramento metropolitan area by December 2014. Before and after studies for this strategy are planned. • Improve the response time for the FSP. Current average response time is ten minutes. Discussions are continuing with district and CHP to reduce the response time. Implementation schedule for reducing the response time depends on increasing FSP training, increasing FSP tow truck numbers, and increasing FSP certification. Schedule for these processes are estimated to be one year. • Repair and update vehicle detector system to improve data collection. Current project (EA 3F840) to repair and update existing vehicle detection systems is in project development process and is about 40 percent completed. The PA&ED will be in January 2015. It will be Ready To List by December 2016, and it will be completed by October 2017. 	<ul style="list-style-type: none"> • Remove ineligible vehicles from the HOV lane. • Improve traffic demand management. • Properly operating vehicle detector system will ensure data accuracy.

Table 3

DISTRICT 3 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
3	99 SB	SAC R24.300	SAC 16.034	2	<ul style="list-style-type: none"> • High HOV violation rates. • Non-recurrent congestion, such as collisions, weather, and construction reduce operating speed. • Geometric constraints such as narrow lanes and shoulders width from Route 50 to Fruitridge Road result in reduced speeds. • Lane drop at Fruitridge Road from five lanes to four lanes creates bottleneck, increases merge/weave turbulence, and reduces speeds in all lanes. • Lane drop at Calvin Road from five lanes to four lanes creates bottleneck, increases vehicle weaving movement, and reduces speeds in all lanes. • Issues with the vehicle detector system such as communication and power disruptions. • Rapid population growth in the suburban city of Elk Grove has increased traffic volumes and congestion on all lanes on Route 99. 	<ul style="list-style-type: none"> • District 3 established a partnership with the CHP to increase enforcement on the HOV lanes. District 3 and local CHP office are applying for an Office of Traffic Safety (OTS) funding grant. The grant schedule calls for a submittal to the OTS in May 2014. District 3 originated the grant request by arranging a meeting with CHP in November 2013. The grant request includes funding for before and after studies of HOV lane mobility. HOV lane speeds will also be monitored during the enforcement period. An estimated \$1.18 million was requested for costs which include additional personnel cost, enforcement overtime hours, and public education materials. • Add ramp metering to all southbound ramps. A project (EA 350F0K) is currently in the project development process. This project should ease congestion and improve average vehicle speeds in all lanes. The Sacramento Area Council of Governments has committed \$11.5 million in Regional Transportation Improvement Plan (RTIP) funds towards this project with funds programmed over three years starting in FY 16/17. Construction is scheduled for FY 18/19. • Reduce ramp metering release rates. The process has already begun and is scheduled to be completed for all ramp meters in the Sacramento metropolitan area by December 2014. Before and after studies for this strategy are planned. • Improve the response time for the FSP. Current average response time is ten minutes. Discussions are continuing with district and CHP to reduce the response time. Implementation schedule for reducing the response time depends on increasing FSP training, increasing FSP tow truck numbers, and increasing FSP certification. Schedule for these processes are estimated to be one year. • Repair and update vehicle detector system to improve data collection. Current project (EA 3F840) to repair and update existing vehicle detection systems is in project development process and is about 40 percent completed. The PA&ED will be in January 2015. It will be Ready To List by December 2016, and it will be completed by October 2017. 	<ul style="list-style-type: none"> • Improve traffic demand management. • Remove ineligible vehicles from the HOV lane. • Properly operating vehicle detector system will ensure data accuracy.

Figure 2

**DISTRICT 4 DEGRADED HOV LANES
JULY 1 TO DECEMBER 31, 2013**



Table 4							
DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	4 EB	CC R20.088	CC 24.400	2	<ul style="list-style-type: none"> General purpose lanes bottleneck as a result of lane reduction from four lanes to two lanes within a short distance. Congestion in the general purpose lanes extends into the HOV lane at the end termini. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Extend the HOV lane and add second general purpose lane (began construction March 2012, and end construction summer 2016 for the last phase). Project limits are from Contra Loma Boulevard to Hillcrest Avenue. Preliminary project cost is estimated at \$165 million and would be funded by Contra Costa Transportation Authority. Currently there are three ongoing construction projects to widening the highway and extend the HOV lane. They are not stand-alone projects but rather a part of a corridor master plan for a series of smaller segment projects. District staff will continue to monitor the corridor and assess "before" and "after" conditions. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management.
4	4 WB	CC R20.088	CC R15.800	2	<ul style="list-style-type: none"> HOV lane speed drop in response to congestion in the general purpose lanes. End of the HOV lane. Congestion in the general purpose lanes extends into the HOV lane at the end termini. General purpose lanes bottleneck as a result of split to Route 242 and westbound Route 4. 	<ul style="list-style-type: none"> Implement ramp metering. This project is in construction. Repair and update detector system to improve data collection. The work is ongoing. 75 percent of the mainline stations are operational. District is working with Contra Costa Transportation Authority to initiate a proposal near the westbound HOV lane downstream terminus to widen and/or extend the HOV lane. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	80 EB	ALA 2.500	CC 6.634	3	<ul style="list-style-type: none"> Demand exceeds capacity. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Ongoing Integrated Corridor Mobility project including active traffic management (variable speed limits) and ramp metering (began construction October 2011, and end construction January 2015). Preliminary project cost is estimated at \$80 million. This project is funded from Corridor Mobility Improvement Account and is estimated for completion in the winter 2015. The scope of the project is to install variable speed limit signs and ramp metering along the I-80 corridor. Future project to convert HOV lane to express lane. Preliminary engineering and environmental studies are currently being done. The Metropolitan Transportation Commission categorized this project as Tier 1. Scheduled to open early 2020. Project limits are from the Carquinez Bridge to the San Francisco Oakland Bay Bridge approach. Preliminary project cost is estimated at \$75 million and would be funded by the Metropolitan Transportation Commission. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management.

Table 4							
DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	80 WB	CC 7.446	ALA 1.900	3	<ul style="list-style-type: none"> Demand exceeds capacity. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Ongoing Integrated Corridor Mobility project including active traffic management (variable speed limits) and ramp metering (began construction October 2011, and end construction January 2015). Preliminary project cost is estimated at \$80 million. This project is funded from Corridor Mobility Improvement Account and is estimated for completion in the winter of 2015. The scope of the project is to install variable speed limit signs and ramp metering along the I-80 corridor. Future project to convert HOV lane to express lane. Preliminary engineering and environmental studies are currently being done. The Metropolitan Transportation Commission categorized this project as Tier 1. Scheduled to open early 2020. Project limits are from the Carquinez Bridge to the San Francisco Oakland Bay Bridge approach. Preliminary project cost is estimated at \$75 million and would be funded by the Metropolitan Transportation Commission. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management.
4	85 NB	SCL 4.795	SCL R19.005	2	<ul style="list-style-type: none"> HOV volume is at or near capacity. Congestion in HOV lane where Route 85 and Route 101 HOV lane merge together. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Project to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (begin construction 2016, and end construction fall 2017). The project limits are from the Route 101 interchange in San Jose to the Route 101 interchange in Mountain View. Preliminary project cost is estimated at \$185 million and would be funded by Santa Clara Valley Transportation Authority through design stage of the project. Repair and update detector system to improve data collection. The work is ongoing. All mainline stations are operational and repaired in 2014. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.

Table 4 DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	85 SB	SCL R23.800	SCL 4.795	2	<ul style="list-style-type: none"> HOV volume is at or near capacity. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Project to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (begin construction 2016, and end construction fall 2017). The project limits are from the Route 101 interchange in San Jose to the Route 101 interchange in Mountain View. Preliminary project cost is estimated at \$185 million and would be funded by Santa Clara Valley Transportation Authority through design stage of the project. Repair and update detector system to improve data collection. The work is ongoing. All mainline stations are operational and repaired in 2014. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	87 NB	SCL 0.200	SCL 7.297	2	<ul style="list-style-type: none"> Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Repair and update detector system to improve data collection. The work is ongoing. 45 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Properly operating vehicle detector system will ensure data accuracy.
4	87 SB	SCL 7.297	SCL 0.200	2	<ul style="list-style-type: none"> Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Repair and update detector system to improve data collection. The work is ongoing. 75 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Properly operating vehicle detector system will ensure data accuracy.
4	101 NB	SON 15.200	SON 18.400	2	<ul style="list-style-type: none"> Reconstruction of the East Washington Street interchange. Increase in traffic as a result of the Graton Casino that opened on November 5, 2013. 	<ul style="list-style-type: none"> Monitor area and reassess network performance after construction project is complete. 	<ul style="list-style-type: none"> Improve traffic demand management.

Table 4

DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	101 NB	MRN 3.800	MRN 8.323	2	<ul style="list-style-type: none"> HOV lane speed drop in response to congestion in the general purpose lanes near Sir Francis Drake and Lucky Drive interchange. Sir Francis Drake interchange provides access to eastbound Route 580. Gap in HOV lane between Atherton Avenue in Marin County to Redwood Highway in Sonoma County. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Implement ramp metering. This project is ongoing. Anticipated completion date in December 2018. Several projects along the Marin-Sonoma Narrows Corridor are being developed that include HOV gap closure. Current HOV hour of operation start at 4:30 PM. HOV lane hours of operation may be changed to 3:00 PM to coincide with HOV hours north of the corridor upon completion of the projects 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	101 NB	SCL 30.810	SM 6.600	2	<ul style="list-style-type: none"> HOV volume is at or near capacity. Reduced speeds in HOV lane could be caused by incidents. Congestion in the general purpose lanes extends into the HOV lane at the end termini. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Future project to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility. Begin construction in 2016, and end construction fall 2017. Project limits are from East Dunne Avenue to Oregon Exp/Embarcadero Road. Preliminary project cost is estimated at \$416 million and would be funded by Santa Clara Valley Transportation Authority through design stage of the project. A construction project to add auxiliary lanes at the HOV lane end termini completed in November 2012. Auxiliary lanes improve merging and diverging at the on-ramps and off-ramps which can affect general purpose lanes traffic. Improving traffic on the general purpose lanes would improve vehicle movement in and out of the HOV lane and reduce the impact to the HOV lane speed. Repair and update detector system to improve data collection. The work is ongoing. 55 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	101 SB	MRN 18.900	MRN 12.846	2	<ul style="list-style-type: none"> HOV lane operation ends at 8:30 AM. Fluctuation of the vehicle movements during the transitional period from HOV lane to a general purpose lane. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane.

Table 4

DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	101 SB	SM 6.600	SCL R35.534	2	<ul style="list-style-type: none"> HOV volume is at or near capacity. HOV lane speed drop in response to congestion in the general purpose lanes between De La Cruz Boulevard and Route 87, and between De La Cruz Boulevard and Fair Oaks Avenue. Construction of a second HOV lane between the Route 85 direct HOV connector to Embarcadero Road/Oregon Expressway interchange in 2011 through 2013. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Future project to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (begin construction in 2016, and end construction fall 2017). Project limits from East Dunne Avenue to Oregon Expressway/Embarcadero Road Project will convert the existing HOV lane into express lane and construct a second express lane between Cochrane Road to Route 85 (San Jose) and from Blossom Hill Road to Mathilda Avenue in both the northbound and southbound direction. Preliminary project cost is estimated at \$416 million and would be funded by Santa Clara Valley Transportation Authority through design stage of the project. Project to add a lane between Story Road interchange and Yerba Buena interchange. Modify Tully interchange (began construction November 2010, and end construction October 2012) and Capitol Expressway interchange (began construction August 2012, and end construction December 2014). Delay and congestion has been reduced on southbound Route 101. Future ramp metering project. Ramp meters in San Mateo County will be active in October 2014 for the northbound direction, and February 2015 for the southbound direction. Preliminary project cost is estimated at \$15 million and would be funded by State Highway Operation and Protection Program (SHOPP) funds and federal Congestion Mitigation and Air Quality Improvement (CMAQ) program funds. Repair and update detector system to improve data collection. The work is ongoing. 70 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	101 SB	SCL R21.724	SCL R17.000	2	<ul style="list-style-type: none"> Congestion in the general purpose lanes extends into the HOV lane at the end termini. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Future Project to add an express lane and convert existing HOV lane into an express lane to operate as dual express lanes. The project will also extend the HOV lane to East Dunne Avenue. Construction is scheduled for 2016, and end construction in fall 2017. Preliminary project cost is estimated at \$416 million and would be funded by Santa Clara Valley Transportation Authority through design stage of the project. Repair and update detector system to improve data collection. The work is ongoing. 50 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.

Table 4							
DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	237 EB	SCL 3.000	SCL R6.241	2	<ul style="list-style-type: none"> Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Conversion of the HOV lane to express lane was completed in 2012 between Zanker Road and Route 880 (began construction summer 2011, and end construction spring 2012) The express lane on eastbound Route 237 operates as HOV only for part of the PM peak period due to residual effect of congestion on northbound Route 880. Future project to extend the express lane from Zanker Road to Mathilda Avenue. Preliminary engineering and environmental studies are currently being done. Construction is scheduled to begin in early 2016 and complete by the end of 2016. Half of the \$16 million construction cost will be provided by the Valley Transportation Authority and other local funds. Provides available capacity in the HOV lane. express lane extension will relieve existing bottlenecks and congestion that currently start to form during the peak period. Repair and update detector system to improve data collection. The work is ongoing. 67 percent of the mainline stations are operational, and the work is ongoing. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	280 NB	SCL 6.879	SCL 14.000	2	<ul style="list-style-type: none"> High HOV violation rates. Roadway geometric constraints and traffic bottlenecks along this corridor. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Route 280/Route 880/Stevens Creek interchange modification in construction to relieve congestion on Route 280 at this location (began construction September 2012, and end construction March 2015). Preliminary project cost is estimated at \$53 million and would be funded by Corridor Mobility Improvement Account. Repair and update detector system to improve data collection. All mainline stations are operational and were repaired in 2014. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve operations at the Route 280/Route 880 interchange. Properly operating vehicle detector system will ensure data accuracy.
4	280 SB	SCL 10.439	SCL 6.879	2	<ul style="list-style-type: none"> Demand exceeds capacity. Increased seasonal traffic within the vicinity of shopping malls along the corridor during the winter months. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management.

Table 4

DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	580 EB	ALA 13.200	ALA R7.800	2	<ul style="list-style-type: none"> Demand exceeds capacity. General purpose lane reduction from five lanes to four lanes at the HOV termini causing bottleneck. HOV lane is degraded mainly on Friday evening due to the high volume of commuters leaving the Bay Area for the weekend. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Future project to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (begin construction fall 2014, and end construction spring 2015). Project limits are from Hacienda Dr. to Greenville Rd. Preliminary project cost is estimated at \$20 million and would be funded by Alameda County Transportation Commission. Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Future freeway widening to add truck climbing lanes. Construction is proposed to be completed by December 2015. Preliminary project cost is estimated at \$51 million and would be funded by state SHOPP funds. Project will improve capacity and flow in the general purpose lanes, and reduce speed difference and conflict between HOV and general purpose lanes. Implement ramp metering. This project is ongoing. Ramp metering between the Cities of Livermore and Dublin/Pleasanton is already operational. Ramp metering west of the Dublin/Pleasanton is in the planning phase as part of Freeway Performance Initiative with CMAQ funding and scheduled for completion in March 2016. Managing and controlling incoming on-ramp traffic would improve flow in the general purpose lanes thus reduce conflicts between HOV and general purpose lanes. Preliminary project cost is estimated at \$6 million and would be funded by Metropolitan Transportation Commission. Repair and update detector system to improve data collection. The work is ongoing. Anticipated completion date is October 2015. 	<ul style="list-style-type: none"> Improve traffic demand management. Remove ineligible vehicles from the HOV lane. Properly operating vehicle detector system will ensure data accuracy.
4	680 NB	CC R3.898	CC R11.900	2	<ul style="list-style-type: none"> Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Construction of an auxiliary lane between Crow Canyon and Sycamore (began construction March 2013, and end construction December 2014). Project cost is estimated at \$25 million and is funded by STIP & Contra Costa Transportation Authority. Future project to convert existing HOV lane to a express lane (begin construction February 2015, and end construction November 2015). Project limits are from Rudgear Road to Alcosta Boulevard. Project cost is estimated at \$38 million and is funded by Metropolitan Transportation Commission. Repair and update detector system to improve data collection. The work is ongoing. 60 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	680 SB	CC R18.579	CC 16.300	2	<ul style="list-style-type: none"> Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Repair and update detector system to improve data collection. All mainline stations are now operational and repaired in 2014. 	<ul style="list-style-type: none"> Properly operating vehicle detector system will ensure data accuracy.

Table 4							
DISTRICT 4 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
4	880 NB	SCL 8.700	ALA 19.300	2	<ul style="list-style-type: none"> HOV lane speed drop in response to congestion in the general purpose lanes. Vehicle weaving conflict at Route 84 interchange and Route 92 interchange. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Future project to convert HOV lane to express lane (begin construction March 2015, and end construction January 2016). Project limits are from southbound from 66th Avenue in Oakland (including new HOV lane extension that will be converted to express lane) to Route 237. Preliminary project cost is estimated at \$66 million and would be funded by Metropolitan Transportation Commission. Repair and update detector system to improve data collection. The work is ongoing. 80 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operating vehicle detector system will ensure data accuracy.
4	<u>880 NB</u>	ALA R34.700	ALA R35.400	2	<ul style="list-style-type: none"> Demand exceeds capacity. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Apply Integrated Corridor Management strategies on Route 80 which include active traffic management (variable speed limits) and ramp metering (began construction October 2011, and end construction January 2015). Preliminary project cost is estimated at \$80 million. This project is funded from Corridor Mobility Improvement Account and is estimated for completion in winter of 2015. The scope of the project is to install variable speed limit signs and ramp metering along the I-80 corridor. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management. Improvements on Route 80 may reduce congestion from extending onto Route 880.
4	880 SB	ALA 22.700	ALA 3.318	2	<ul style="list-style-type: none"> High volume coming from Route 238. HOV lane speed drop in response to congestion in the general purpose lanes. Vehicle weaving conflict at the Route 92 interchange and Route 84 interchange. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement on the HOV lane. An agreement was reached between District 4 and CHP on March 25, 2014, to increase enforcement of the HOV lanes, with priority being the extremely degraded segments, followed by very degraded and slightly degraded segments. Future project to convert HOV lane to express lane (begin construction in 2015, and end construction summer 2017). Project limits are from southbound from 66th Avenue in Oakland (including new HOV lane extension that will be converted to express lane) to Route 237. Preliminary project cost is estimated at \$66 million and would be funded by Metropolitan Transportation Commission. Repair and update detector system to improve data collection. The work is ongoing. 95 percent of the mainline stations are operational. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Properly operating vehicle detector system will ensure data accuracy. Improve traffic demand management.

Figure 3

**DISTRICT 7 DEGRADED HOV LANES
JULY 1 TO DECEMBER 31, 2013**



Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	5 NB	LA 42.389	LA R45.600	2	<ul style="list-style-type: none"> General purpose lane drop at San Fernando Mission Road cause bottleneck. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane. Ongoing construction of the Route 14 HOV connector. 	<ul style="list-style-type: none"> Reassess network performance after construction at the Route 14 connector complete in July 2018. Construction is estimated at \$132.4 million. The HOV Direct Connector will maintain HOV traffic flow and minimize vehicle weaving conflict necessary to access Route 14. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.
7	5 SB	LA 42.389	LA 39.400	2	<ul style="list-style-type: none"> Construction activities along the route to add HOV capacity. 	<ul style="list-style-type: none"> Construction activities along the route to add HOV capacity. Defer action until construction complete in 2016 and traffic normalize. Construction activity is occurring in the inside median to add the capacity of an HOV lane. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. 	<ul style="list-style-type: none"> Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	10 EB	LA 17.000	LA 31.200	2 (3 during peak periods)	<ul style="list-style-type: none"> Construction activity at the Route 10/Route 605 interchange. This project will complete in 2017. Temporary concrete barriers within the work zone reduce lane width resulting in slower speed. The vehicle detector systems were affected by damage inductive detector loops during construction, incorrect wire connections, or misalignment from the lane shifts. Bottleneck at Route 605 due to general purpose lane drop and diverge. 	<p>Caltrans, in partnership with MTA, will consider implementing the following strategies to improve performance:</p> <ul style="list-style-type: none"> Various operational changes to express lane operation by adjusting congestion pricing algorithm. Algorithm adjustment is done on a continual basis. The toll has varied from \$5 to \$12 over the last few years. Recently signed legislation AB 1721 (2014) allows for charging clean air vehicles a reduced toll rate instead of toll-free. Caltrans and MTA will initiate a study within the next six to 12 months to assess modifying current express lane operation. The modifications may include eliminating ingress/egress locations to reduce vehicle movement conflict, increasing occupancy requirement, and removing the limit on toll rate. During the conversion from HOV to express lane, MTA added three CHP officers to enforce express lane during the peak periods. Within the last year, MTA has initiated a CHP saturation program using additional CHP staff to address occupation violations. Additional signs will be installed along the express lane to inform motorists of regulations and deter violators. MTA has added additional signs notifying that FasTrak transponders are required to access the express lane. Route 10 and Route 605 Interchange Improvement Project is currently under construction, and will complete in 2017. The project costs \$62.5 million. Defer action until construction is completed and traffic normalizes. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2016. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. Repair and update detector system to improve data collection. The work is ongoing. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operational vehicle detector system will ensure data accuracy.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	10 EB	LA 42.400	LA 48.260	2 (3 during peak periods)	<ul style="list-style-type: none"> High vehicle and truck volume from Route 57. Construction activity at the Route 10/Route 605 interchange. General purpose lane congestion as a result of vehicle weaving conflict at the eastbound South Indian Hills Boulevard onramp, Post Mile 47.912. The auxiliary lane's pavement markings resemble a fifth lane. 	<ul style="list-style-type: none"> Route 10 and Route 605 Interchange Improvement Project is currently under construction, and will complete in 2017. The project costs \$62.5 million. Defer action until construction is completed and traffic normalizes. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2016. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	10 WB	LA 31.200	LA 17.000	2 (3 during peak periods)	<ul style="list-style-type: none"> Construction activity at the Route 10/Route 605 interchange. This project will complete in 2017. The HOV lane was converted to express lane as of February 23, 2013. Vehicle volume has increase as a result of the addition of the toll paying vehicles as well as an increase in violation rate. It is anticipated that this affect will decrease over time as motorists become accustomed to using the FasTrak transponders and the new pricing demand strategies. Possible congestion due to vehicles merging onto congested traffic on Route 101 or onto Alameda Street. Issues with the vehicle detector system such as communication and power disruptions. 	<p>Caltrans, in partnership with MTA, will consider implementing the following strategies to improve performance:</p> <ul style="list-style-type: none"> Various operational changes to express lane operation by adjusting congestion pricing algorithm. Algorithm adjustment is done on a continual basis. The toll has varied from \$5 to \$12 over the last few years. Recently signed legislation, AB 1721 (2014), allows for charging clean air vehicles a reduced toll rate instead of toll-free. Caltrans and MTA will initiate a study within the next six to 12 months to assess modifying current express lane operation. The modifications may include eliminating ingress/egress locations to reduce vehicle movement conflict, increasing occupancy requirement, and removing the limit on toll rate. During the conversion from HOV to express lane, MTA added three CHP officers to enforce express lane during the peak periods. Within the last year, MTA has initiated a CHP saturation program using additional CHP staff to address occupation violations. Additional signs will be installed along the express lane to inform motorists of regulations and deter violators. MTA has added additional signs notifying that FasTrak transponders are required to access the express lane. Route 10 and Route 605 Interchange Improvement Project is currently under construction, and will complete in 2017. The project costs \$62.5 million. Defer action until construction is completed and traffic normalizes. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2016. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. Repair and update detector system to improve data collection. The work is ongoing. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operational vehicle detector system will ensure data accuracy.

Table 5							
DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	14 NB	LA R24.800	LA R29.281	2	<ul style="list-style-type: none"> HOV lane ends at Route 5 interchange. Construction activity building a direct connector to Route 5. 	<ul style="list-style-type: none"> Reassess network performance after construction at the Route 5 connector complete in July 2018. Construction is estimated at \$132.4 million. The HOV Direct Connector will maintain HOV traffic flow and minimize vehicle weaving conflict necessary to access Route 5. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.
7	14 NB	LA 42.775	LA R47.256	2	<ul style="list-style-type: none"> Construction activity along the route to replace concrete slabs, pavement grinding, and apply hot-mixed asphalt. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Monitor area and field review after construction project is complete in 2014. Repair and update detector system to improve data collection. The work is ongoing. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operational vehicle detector system will ensure data accuracy.
7	14 SB	LA R29.281	LA R24.788	2	<ul style="list-style-type: none"> Construction activity to build a direct connector to Route 5. 	<ul style="list-style-type: none"> Reassess network performance after construction at the Route 5 connector complete in July 2018. Construction is estimated at \$132.4 million. The HOV Direct Connector will maintain HOV traffic flow and minimize vehicle weaving conflict necessary to access Route 5. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.
7	57 NB	LA R0.000	LA R4.500	2	<ul style="list-style-type: none"> High traffic demand from the Orange County area and eastbound Route 60. This area also has a very high truck volume with steep terrain. Demand exceeds capacity. Existing guide signs need to be update. The overhead signs show inconsistent route direction information. Incomplete interchange at Route 57. Motorists currently must exit onto Diamond Bar Boulevard to access northbound Route 57. 	<ul style="list-style-type: none"> Ongoing construction of the Route 57/Route 60 Interchange improvement project. Completion will be in 2017. Study area when traffic normalizes after completion of construction. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.

Table 5							
DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	57 SB	LA R4.500	LA R0.000	2	<ul style="list-style-type: none"> High traffic demand from the Orange County area and eastbound Route 60. This area also has a very high truck volume with steep terrain. Demand exceeds capacity. Existing guide signs need to be updated. The overhead signs show inconsistent route direction information. Incomplete interchange at Route 57. Motorists currently must exit onto Diamond Bar Boulevard to access northbound Route 57. 	<ul style="list-style-type: none"> Ongoing construction of the Route 57/Route 60 Interchange improvement project. Completion will be in 2017. Study area when traffic normalizes after completion of construction. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.
7	60 EB	LA R23.000	LA R30.450	2	<ul style="list-style-type: none"> Demand exceeds capacity. High volume as a result of Route 57 and Route 60 merge together. High truck volume. Existing guide signs need to be updated. The overhead signs show inconsistent route direction information. 	<ul style="list-style-type: none"> Ongoing construction of the Route 57/Route 60 Interchange improvement project. Completion will be in 2017. Study area when traffic normalizes after completion of construction. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.
7	60 WB	LA R30.450	LA R23.000	2	<ul style="list-style-type: none"> Demand exceeds capacity. High volume as a result of Route 57 and Route 60 merge together. High truck volume. Existing guide signs need to be updated. The overhead signs show inconsistent route direction information. 	<ul style="list-style-type: none"> Ongoing construction of the Route 57/Route 60 Interchange improvement project. Completion will be in 2017. Study area when traffic normalizes after completion of construction. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	91 EB	LA R6.400	LA R20.700	2	<ul style="list-style-type: none"> General purpose lane drop at Route 710 interchange and Route 605 interchange causes bottleneck. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane. 	<ul style="list-style-type: none"> Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which includes southern portion of Route 405 (Route 605 to Temple Avenue). Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project's scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.
7	91 WB	LA R20.700	LA R11.167	2	<ul style="list-style-type: none"> General purpose lane drop at Route 710 interchange and Route 605 interchange causes bottleneck. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which includes southern portion of Route 405 (Route 605 to Temple Avenue). Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project's scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. Repair and update detector system to improve data collection. The work is ongoing. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operational vehicle detector system will ensure data accuracy.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	105 EB	LA R2.200	LA R18.090	2	<ul style="list-style-type: none"> General purpose lanes demand exceed capacity. General purpose lane drops at Prairie Avenue and South Vermont Avenue causes bottleneck. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes. Congestion in the general purpose lanes extends into the HOV lane at the end termini. 	<ul style="list-style-type: none"> Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which Route 105/Route 405 interchange. Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project's scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Restripe the general purpose lanes to sustain four lanes. The PID was approved. The project will be funded from South Bay Measure R (Highway Program). The project costs \$30 million. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management. Minimize vehicle weaving conflicts at ingress/egress locations.
7	105 WB	LA R14.117	LA R6.172	2	<ul style="list-style-type: none"> Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes and at the Route 710 interchange. General purpose lane drops cause bottlenecks. Existing guide signs need to be update. 	<ul style="list-style-type: none"> Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which Route 105/Route 405 interchange. Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project's scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management. Minimize vehicle weaving conflicts at ingress/egress locations.

Table 5							
DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	110 NB	LA 9.800	LA 20.500	2	<ul style="list-style-type: none"> The HOV lane was converted to express lane as of November 10, 2012. Vehicle volume has increase as a result of the addition of the toll paying vehicles as well as an increase in violation rate. It is anticipated that this effect will decrease over time as motorists become accustomed to using the FasTrak transponders and the new pricing demand strategies. 	<p>Caltrans, in partnership with MTA, will consider implementing the following strategies to improve performance:</p> <ul style="list-style-type: none"> Various operational changes to express lane operation by adjusting congestion pricing algorithm. Algorithm adjustment is done on a continual basis. The toll has varied from \$5 to \$12 over the last few years. Recently signed legislation, AB 1721 (2014), allows for charging clean air vehicles a reduced toll rate instead of toll-free. Caltrans and MTA will initiate a study within the next six to 12 months to assess modifying current express lane operation. The modifications may include eliminating ingress/egress locations to reduce vehicle movement conflict, increasing occupancy requirement, and removing the limit on toll rate. During the conversion from HOV to express lane, MTA added three CHP officers to enforce express lane during the peak periods. Within the last year, MTA has initiated a CHP saturation program using additional CHP staff to address occupation violations. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.
7	110 SB	LA 16.933	LA 13.367	2	<ul style="list-style-type: none"> The HOV lane was converted to express lane as of November 10, 2012. Vehicle volume has increase as a result of the addition of the toll paying vehicles as well as an increase in violation rate. It is anticipated that this effect will decrease over time as motorists become accustomed to using the FasTrak transponders and the new pricing demand strategies. 	<p>Caltrans, in partnership with MTA, will consider implementing the following strategies to improve performance:</p> <ul style="list-style-type: none"> Various operational changes to express lane operation by adjusting congestion pricing algorithm. Algorithm adjustment is done on a continual basis. The toll has varied from \$5 to \$12 over the last few years. Recently signed legislation, AB 1721 (2014), allows for charging clean air vehicles a reduced toll rate instead of toll-free. Caltrans and MTA will initiate a study within the next six to 12 months to assess modifying current express lane operation. The modifications may include eliminating ingress/egress locations to reduce vehicle movement conflict, increasing occupancy requirement, and removing the limit on toll rate. During the conversion from HOV to express lane, MTA added three CHP officers to enforce express lane during the peak periods. Within the last year, MTA has initiated a CHP saturation program using additional CHP staff to address occupation violations. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.

Table 5							
DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	118 EB	LA R3.800	LA R11.400	2	<ul style="list-style-type: none"> The HOV lane terminates before the Route 5 interchange and merges into the number two lane. Congestion in the general purpose lanes extends into the HOV lane at the end termini. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. Repair and update detector system to improve data collection. The work is ongoing. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operational vehicle detector system will ensure data accuracy.
7	134 EB	LA 4.428	LA R8.855	2	<ul style="list-style-type: none"> Vehicle weaving conflict at Route 5 interchange. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. Repair and update detector system to improve data collection. The work is ongoing. 	<ul style="list-style-type: none"> Improve traffic demand management. Properly operational vehicle detector system will ensure data accuracy.
7	170 NB	LA R17.505	LA R20.510	2	<ul style="list-style-type: none"> The HOV lane ends. Route 170 ends and merge into Route 5. Traffic volume at the Route 170/Route 101/Route 134 interchange exceeds capacity. There is a general purpose lane drop. This interchange is currently under construction which includes an HOV direct connector to Route 5. 	<ul style="list-style-type: none"> Route 5/Route 170 HOV direct connector is currently under construction. Completion will be in 2016. Construction activity is occurring in the inside median to add the capacity of an HOV lane. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Reassess network performance after traffic normalizes with the HOV direct connector. Improve traffic demand management.

Table 5							
DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	170 SB	LA R17.505	LA R14.500	2	<ul style="list-style-type: none"> The HOV lane ends. Route 170 ends and becomes Route 101. Traffic volume at the Route 170/Route 101/Route 134 interchange exceeds capacity. General purpose lane drops from four lanes to two lanes. Congestion on Route 101 extends into Route 170. Freeway widening project to add lanes at Route 170/Route 101/Route 134 interchange. 	<ul style="list-style-type: none"> Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. Freeway widening project to add lanes at Route 170/Route 101/Route 134 interchange. The project includes a complete reconstruction of the Route 170/Route 5 interchange that will also add an HOV Direct Connector to Route 5 and a continuous HOV lane on Route 5. 	<ul style="list-style-type: none"> Improve traffic demand management.
7	210 EB	LA R25.000	LA R52.100	2	<ul style="list-style-type: none"> General purpose lane drops at El Molino Avenue Rosemead Boulevard and San Dimas Avenue cause bottlenecks. High volumes entering from Route 57. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes. 	<ul style="list-style-type: none"> Coordinate with the CHP to increase enforcement. Normally, traffic counts are scheduled in the fall, based on the manual traffic counts the violation rates are determined. In February 2014, a meeting with the CHP was conducted at which time the violation percentage rates per route are provided and the appropriate enforcement is scheduled. D7 is establishing the Operational Connected Corridor 2016. This will involve the coordination between Caltrans, local agencies, CHP and first responders for incident management, construction activities, and special events. The project includes ramp metering synchronization, traffic signal synchronization, Transportation Management System, and Intelligent Transportation System. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Remove ineligible vehicles from the HOV lane. Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	210 WB	LA R47.532	LA R25.000	2	<ul style="list-style-type: none"> General purpose lane drop at Sunflower Avenue causes bottleneck. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes and at the Route 605 interchange. General purpose lane congestion as a result of vehicle weaving conflict at the westbound Huntington Drive on-ramp. The auxiliary lane pavement markings resemble a fifth lane. High truck volume. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> D7 is establishing the Operational Connected Corridor 2016. This will involve the coordination between Caltrans, local agencies, CHP and first responders for incident management, construction activities, and special events. The project includes ramp metering synchronization, traffic signal synchronization, Transportation Management System, and Intelligent Transportation System. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.
7	405 NB	LA 0.000	LA 26.400	2	<ul style="list-style-type: none"> General purpose lane drop prior to Route 110 interchange causes a bottleneck. Construction activities along the route. Bridge rehabilitation between Post Miles 3.4 to 4.5 will complete in 2018. Installation of concrete and metal barriers between Post Miles 1.74 to 11.5 will complete in 2019. Modification of Wilmington Avenue interchange will complete in 2017. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes and at the Route 105 interchange and Route 110 interchange. Residual effect of ongoing upstream construction for the northbound HOV lane. 	<ul style="list-style-type: none"> Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which includes southern portion of Route 405 (Route 605 to Temple Avenue). Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	405 NB	LA 38.915	LA 48.600	2	<ul style="list-style-type: none"> • General purpose lane drops at San Fernando Mission Road and at the end of the HOV lane at Route 5 creating bottlenecks. • Pavement rehabilitation between Route 101 to Route 5. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes. 	<ul style="list-style-type: none"> • Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. • Pavement rehabilitation project will complete in May 2016. Poor pavement condition affects traveling speed, increases vehicle weaving, and disrupts HOV lane traffic due to vehicle weaving conflict and cross-buffer violation. 	<ul style="list-style-type: none"> • Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	405 SB	LA 43.758	LA 0.000	2	<ul style="list-style-type: none"> Poor pavement condition of the three right lanes approaching Route 101. Demand exceeds capacity. Geometric constraints at Route 101 interchange cause congestion. General purpose lane drop from five lanes to three lanes at Route 101 interchange. High vehicle volume from Route 101 in the morning period enters southbound Route 405 combined with weaving to Van Nuys Boulevard off-ramp. Ongoing construction of the Van Nuys Boulevard off-ramp. Pavement rehabilitation between Route 101 and Route 5. Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lanes. High vehicle volumes from Route 90. General purpose lane drop at Route 110, Avalone Boulevard, and Route 710 cause bottlenecks. 	<ul style="list-style-type: none"> The southbound Route 405 HOV lane, from Route 10 to Route 101, will complete in 2014. Defer action until construction is completed and traffic normalizes. Ramp meters are not fully operational throughout project. Some adjustments and changes to ingress/egress locations have been made. Installation of the vehicle detector system will complete within the next several months. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which includes southern portion of Route 405 (Route 605 to Temple Avenue). Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Widening of the Van Nuys Boulevard off-ramp will increase vehicle storage which will reduce the off-ramp volume extending onto the highway. The project will complete in August 2016. Pavement rehabilitation project will complete in May 2016. Poor pavement condition affects traveling speed, increases vehicle weaving, and disrupts HOV lane traffic due to vehicle weaving conflict and cross-buffer violation. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improvements are needed at the Route 101 interchange due to high volumes and vehicle weaving conflicts. Residual effects from the congestion on Route 101 also affect Route 405. Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	605 NB	LA R4.140	LA 20.700	2	<ul style="list-style-type: none"> • General purpose lane drop at Route 5 interchange cause bottleneck. • High vehicle volume from Route 5 causes congestion in the general purpose lanes. • Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane. • Construction activities along the route. Route 10/Route 605 interchange improvement project will complete in 2017. Installation of metal beam guardrail and shoulder widening will complete in 2017. Construction of soundwalls will complete in 2015. 	<ul style="list-style-type: none"> • Meter HOV preferential lane at on-ramps. Work is in progress. Completion by 2020. Connector metering was implemented to the eastbound Route 105 connector to northbound Route 605 in June 2014. • Multiple highway improvement projects are in construction along the route. Route 10/Route 605 interchange improvement project will complete in 2017. Installation of metal beam guardrail and shoulder widening will complete in 2017. Construction of soundwalls will complete in 2015. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. • Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which includes southern portion of Route 405 (Route 605 to Temple Avenue). Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. 	<ul style="list-style-type: none"> • Improve traffic demand management.

Table 5

DISTRICT 7 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
7	605 SB	LA R16.560	LA R8.280	2	<ul style="list-style-type: none"> Vehicle weaving conflict at ingress/egress locations due to congestion in the general purpose lane. General purpose lane demand exceeds capacity. General purpose lane drop at Route 5 interchange causes bottleneck. High vehicle volume from Route 5 causes congestion in the general purpose lanes. Construction activity on Route 10 affects the Route 10/Route 605 interchange and extends congestion onto Route 605. High truck volume. 	<ul style="list-style-type: none"> Route 10/Route 605 Interchange Improvement Project is in construction and will complete in 2017. Defer action until construction completes and traffic normalizes. Construction activity is occurring in the inside median to add the capacity of an HOV lane. Projects in the construction phase are a dynamic process that has many changing facets. Congestion and bottlenecks due to changing lane closure or lane realignments would affect driving patterns and conditions for the motorists. Construction in one segment will affect other segments along the route. Route 91/Route 605/Route 405 Congestion Hot Spots Study on Route 605 between Valley Boulevard to Route 405 which includes southern portion of Route 405 (Route 605 to Temple Avenue). Preliminary engineering and environmental studies are currently being done. The schedule will be finalized as soon as the project scope and cost have been determined. This project is funded by Measure R funds and forthcoming Transportation Strategic Plan-Phase II. The project is eligible for federal aid funding. The project is anticipated to be a high profile project due to the estimated cost in excess of \$500 million. Construction is scheduled to begin in 2024. Consultants analyzed passenger rail projects, bus service expansion, HOV lane, HOV connectors, express lane, freight movement, Transportation Demand Management, and Intelligent Transportation System. Phase II Strategic Transportation Plan completed at the end of 2013. Meter HOV preferential lane at on-ramps. Work is in progress. Completion date will be 2020. Various routes are in different stages. Routes 110, 118, and 710 will be completed at the end of 2015. Project alternatives include metering the HOV preferential lane or convert the HOV preferential lane to general purpose lane. All other routes are being evaluated for conversion or metered. 	<ul style="list-style-type: none"> Improve traffic demand management.

Figure 4

**DISTRICT 8 DEGRADED HOV LANES
JULY 1 TO DECEMBER 31, 2013**

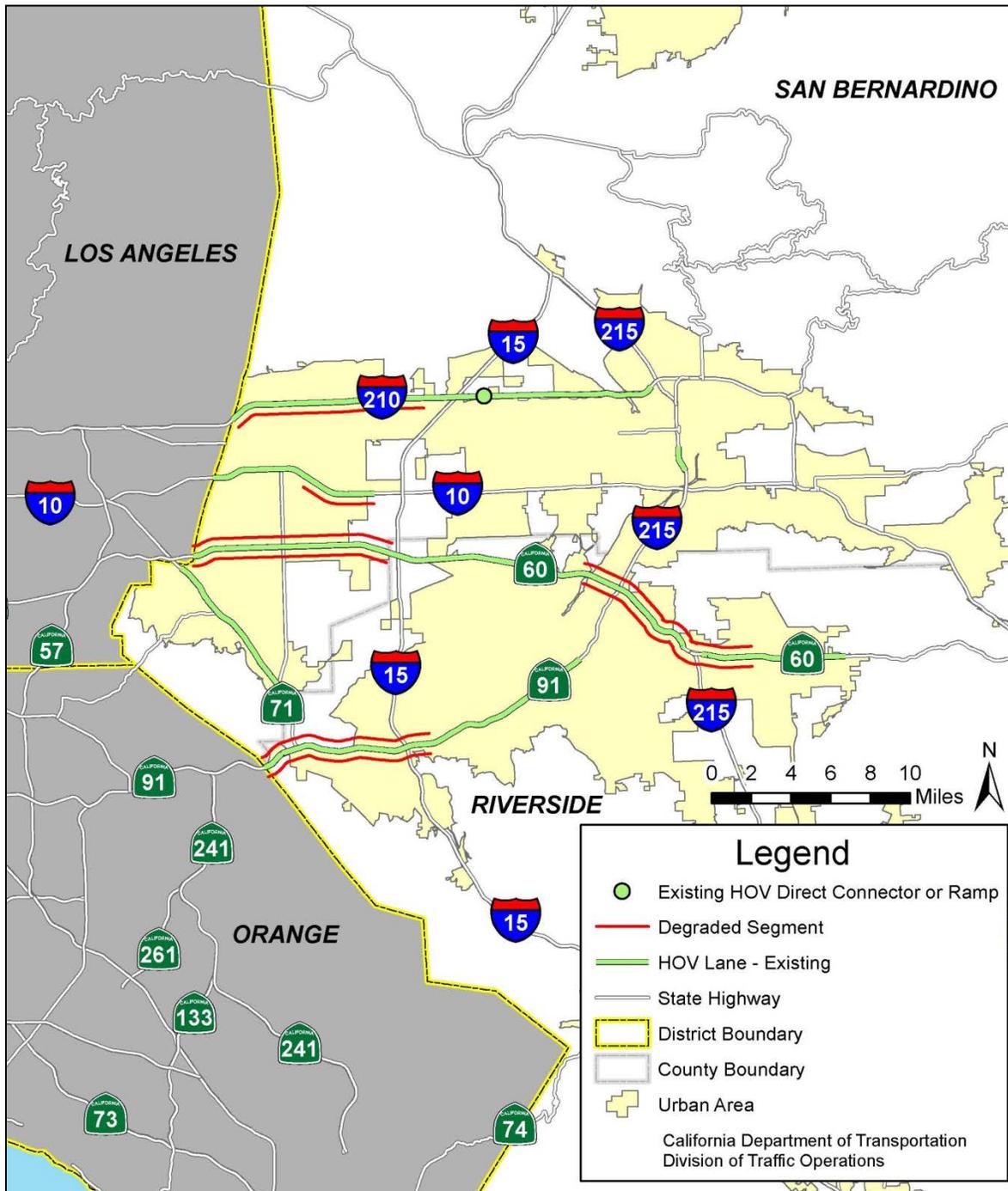


Table 6							
DISTRICT 8 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
8	10 EB	SBD 4.950	SBD 9.900	2	<ul style="list-style-type: none"> Demand exceeds capacity due to vehicles coming from Los Angeles to the Inland Empire. The HOV lane ends at the junction of Route 15. Congestion in the general purpose lane extends into the HOV lane at the end termini. 	<ul style="list-style-type: none"> Project proposed to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility from the Los Angeles county line to the city of Redlands (EA 0C250). Construction expected to begin in August 2019, and end construction in July 2022. Project cost is estimated at \$535.8 million and is funded by STIP and Local Funds. 	<ul style="list-style-type: none"> Improve traffic demand management.
8	60 EB	SBD R0.000	RIV R0.017	2	<ul style="list-style-type: none"> Vehicle weaving conflicts at ingress/egress locations. 	<ul style="list-style-type: none"> Convert HOV lane from limited access to continuous access (EA 0G430). Construction began in February 2013, and completed in May 2013. Project cost was estimated at \$773,000 and is funded by Minor A. The number and location of the existing egress/ingress is not sufficient to handle the increased traffic due to ambient and development growth on the north and south side of Route 60. Additionally, the interchanges along this segment are closely-spaced at approximately one mile interval. Converting the existing limited access to continuous access HOV will improve traffic flow and reduce congestion. The effects of improvements will be monitored using PeMS information, HOV occupancy counts, field observations, and public response. 	<ul style="list-style-type: none"> Reduce vehicle weaving conflicts. Improve traffic demand management.
8	60 EB	RIV 10.266	RIV 15.413	2	<ul style="list-style-type: none"> Ongoing HOV construction project at the junction of Route 60. Gap in the HOV lane at the Route 215 and Route 60 junction. General purpose lanes are congested before the HOV lane termini causing bottleneck. 	<ul style="list-style-type: none"> HOV lane gap-closure project (EA 449314) will maintain the continuity of continuous access HOV lane east and west of Route 60/215 junction. Construction began in May 2011, and expected completion in December 2014. The continuity of HOV lane and the completion of construction works would improve the traffic flow on HOV as well as the general purpose lanes. Project cost is estimated at \$36.5 million and is funded by STIP and local funds. Effects of improvement will be monitored using PeMS information, HOV occupancy counts, field observations, and public response. 	<ul style="list-style-type: none"> Close gap in HOV lane. Improve traffic demand management.

Table 6 DISTRICT 8 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
8	60 WB	RIV 15.413	SBD R0.000	2	<ul style="list-style-type: none"> Vehicle weaving conflicts at ingress/egress locations. Ongoing HOV construction project at the junction of Route 60. Gap in the HOV lane at the Route 215 and Route 60 junction. General purpose lanes are congested before the HOV lane termini causing bottleneck. 	<ul style="list-style-type: none"> Convert HOV lane from limited access to continuous access (EA 0G430). Construction began in February 2013, and completed in May 2013. Project cost was estimated at \$773,000 and is funded by Minor A. The number and location of the existing egress/ingress is not sufficient to handle the increased traffic due to ambient and development growth on the north and south side of Route 60. Additionally, the interchanges along this segment are closely-spaced at approximately one mile interval. Converting the existing limited access to continuous access HOV will improve traffic flow and reduce congestion. The effects of improvements will be monitored using PeMS information, HOV occupancy counts, field observations, and public response. HOV lane gap-closure project (EA 449314) will maintain the continuity of continuous access HOV lane east and west of Route 60/215 junction. Construction began in May 2011, and expected completion in December 2014. The continuity of HOV lane and the completion of construction works would improve the traffic flow on HOV as well as the general purpose lanes. Project cost is estimated at \$36.5 million and is funded by STIP and local funds. Effects of improvement will be monitored using PeMS information, HOV occupancy counts, field observations, and public response. 	<ul style="list-style-type: none"> Reduce vehicle weaving conflicts. Close gap in HOV lane. Improve traffic demand management.
8	91 EB	RIV R0.000	RIV 13.022	2	<ul style="list-style-type: none"> Demand exceeds capacity. HOT-3 lane ends at the Orange/Riverside county line and becomes an HOV-2 lane in Riverside County. 	<ul style="list-style-type: none"> Add a general purpose lane in each direction from Route 71 to Main Street. Convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (EA 0F540). Construction began in July 2013, and expected completion in July 2018. Increase occupancy from HOV-2 to HOT-3 as part of this project. Project cost is estimated at \$1.35 billion and is funded by STIP, local funds, and SLPP Bonds. 	<ul style="list-style-type: none"> Improve traffic demand management.
8	91 WB	RIV 8.644	RIV R0.000	2	<ul style="list-style-type: none"> Demand exceeds capacity. HOV-2 lane ends and becomes a HOT-3 lane at the Orange County line. 	<ul style="list-style-type: none"> Add a general purpose lane in each direction from Route 71 to Main Street. Convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (EA 0F540). Construction began in July 2013, and expected completion in July 2018. Increase occupancy from HOV-2 to HOT-3 as part of this project. Project cost is estimated at \$ 1.35 billion and is funded by STIP, local funds, and SLPP Bonds. 	<ul style="list-style-type: none"> Improve traffic demand management.

Table 6							
DISTRICT 8 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
8	210 EB	SBD 0.000	SBD 9.867	2	<ul style="list-style-type: none"> Demand exceeds capacity due to vehicles coming from Los Angeles to the Inland Empire. Vehicle weaving conflict at ingress/egress. 	<ul style="list-style-type: none"> Project proposed on Route 10 (about 5 miles south and parallel to Route 210) to convert existing HOV lane to express lane and add a second express lane to operate as a dual lane facility (EA 0C250) will alleviate increased demand on Route 210 and provide alternative routes. Construction of express lane on Route 10 begin in August 2019, and end in July 2022. Project cost is estimated at \$535.8 million and is funded by STIP and local funds. Project to convert the existing limited access to continuous access HOV (EA 1E290) is located downstream of the degraded segment. This project will improve the traffic operation within the project limit as well as on the upstream degraded segment. Construction is expected to begin in June 2015 and completed by November 2015. Project cost is estimated at \$1.5 million and is funded by the Minor A program. 	<ul style="list-style-type: none"> Improve traffic demand management.
8	215 NB	RIV R38.300	RIV 43.300	2	<ul style="list-style-type: none"> Ongoing HOV construction project at the junction of Route 60. Gap in the HOV lane at the Route 215 and Route 60 junction. General purpose lanes are congested before the HOV lane ends. 	<ul style="list-style-type: none"> HOV lane gap-closure project (EA 449314) will maintain the continuity of continuous access HOV lane east and west of Route 60/215 junction. Construction began in May 2011, and expected completion in December 2014. Project cost is estimated at \$36.5 million and is funded by STIP and local funds. Effects of improvement will be monitored using PeMS information, conducting HOV occupancy counts, field observations, and public response. Construction of an HOV lane in each direction on Route 215 (Bi-County HOV Project, EA 0M940) and on Route 91 (HOV Widening project EA 44840) south of this segment of Route 215, respectively, will provide continuous HOV lane between Route 215 to the north, Route 60 to the west, and Route 91 to the south. The Bi-county HOV Project (EA 0M940) cost estimate is \$193.2 million; construction began in February 2013, and completion is expected in March 2016. The Route 91 HOV Widening Project (EA 44840) cost estimate is \$225.4 million; construction began in March 2012, and completion is expected in February 2016. Both projects are funded by STIP and local funds. 	<ul style="list-style-type: none"> Close gap in HOV lane. Improve traffic demand management.
8	215 SB	RIV 43.300	RIV R38.300	2	<ul style="list-style-type: none"> Ongoing HOV construction projects on Route 215 north of the junction of Routes 60, 91 and 215, and on Route 91 south of the junction. Gap in the HOV lane on Route 215 to the north and Route 91 to the south. 	<ul style="list-style-type: none"> Construction of an HOV lane in each direction on Route 215 (Bi-County HOV Project, EA 0M940) and on Route 91 (HOV Widening project EA 44840) south of this segment of Route 215, respectively, will provide continuous HOV lane between Route 215 and Route 215 to the north, Route 60 to the west, and Route 91 to the south. The Bi-County HOV Project (EA 0M940) cost estimate is \$193.2 million; construction began in February 2013, and completion is expected in March 2016. The Route 91 HOV Widening Project (EA 44840) cost estimate is \$225.4 million; construction began in March 2012, and completion is expected in February 2016. Both projects are funded by STIP and local funds. 	<ul style="list-style-type: none"> Close gap in HOV lane. Improve traffic demand management.

Figure 5

**DISTRICT 11 DEGRADED HOV LANES
JULY 1 TO DECEMBER 31, 2013**



Table 7

DISTRICT 11 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
11	15 NB	SD M12.00	SD M15.900	2	<ul style="list-style-type: none"> Construction of the Hillery Drive direct access ramp. 	<ul style="list-style-type: none"> Current project to construct Hillery Drive direct access ramps is due to complete construction in late 2014. Construction is estimated at \$25.3 million, scheduled for completion in October 2014, and is funded by Transnet and local tax measures. After project completion, effects of the improvement will be monitored. Monitor area and reassess network performance after construction project is complete. 	<ul style="list-style-type: none"> Improve traffic demand management.
11	15 SB	SD M19.800	SD M15.900	2	<ul style="list-style-type: none"> Construction of the Hillery Drive direct access ramp. 	<ul style="list-style-type: none"> Current project to construct Hillery Drive direct access ramps is due to complete construction in late 2014. Construction is estimated at \$25.3 million, scheduled for completion in October 2014, and is funded by Transnet and local tax measures. After project completion, effects of the improvement will be monitored. Monitor area and reassess network performance after construction project is complete. 	<ul style="list-style-type: none"> Improve traffic demand management.
11	5 NB	SD R30.700	SD R38.500	2	<ul style="list-style-type: none"> HOV volume exceeds capacity. The HOV lane ends at Manchester Avenue. Congestion in the general purpose lanes extends into the HOV lane at the end termini. 	<ul style="list-style-type: none"> Current project development to extend the northbound HOV lane an additional nine miles from Manchester Avenue to Palomar Airport Road, provide a direct access ramp at Manchester Avenue, construct a southbound auxiliary lane between Santa Fe Drive and Birmingham Drive, and construct auxiliary lanes in both directions between Poinsettia Lane and Palomar Airport Road. PA&ED is complete. PS&E is scheduled for completion in July 2015. Construction will begin in Fall 2015 and the project construction will take two years to complete. Currently, the HOV lane ends at a location that experiences recurrent congestion. Extension of the lane an additional nine miles to the north and through the congested segment to the major interchange at Palomar Airport Road should relieve congestion on the HOV facility. A future staged project to extend the HOV lane an additional five miles to the Route 5/Route 78 junction will start construction in Fall 2017. The project calls for performance delay measurements on the constructed HOV facility at the completion of the second stage (extension to Route78). Construction is estimated at \$2.0 billion and is funded by STIP and Transnet. 	<ul style="list-style-type: none"> Increase capacity. Expand the HOV network. Improve traffic demand management.
11	5 SB	SD R34.616	SD R30.700	2	<ul style="list-style-type: none"> Construction activity within the area to extend the HOV lane approximately four miles to the south. The HOV lane ends at the junction of Route 805. Congestion in the general purpose lanes extends into the HOV lane at the end termini. 	<ul style="list-style-type: none"> Current project development to extend the southbound HOV lane an additional five miles starting from one mile south of Route 5/Route 805 interchange to Route 52 and provide a direct access ramp at Mira Mesa Boulevard. PA&ED and PS&E are complete. Construction is scheduled for completion in fall 2016. The project calls for performance delay measurements on the constructed HOV facility at the completion of project construction. Construction is estimated at \$40.2 million and is funded by STIP and Transnet. This is a location that experiences recurrent congestion. Extension of the lane, an additional five miles to the south and through the congested segment to the major interchange at Route 52 should relieve congestion on the HOV facility. 	<ul style="list-style-type: none"> Increase capacity. Expand the HOV network. Improve traffic demand management.

Figure 6

**DISTRICT 12 DEGRADED HOV LANES
JULY 1 TO DECEMBER 31, 2013**



Table 8

DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	5 NB	ORA 11.299	ORA 34.302	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Multiple HOV bottlenecks along the corridor. • Bottlenecks at Route 5/Route 55 HOV direct connector and Route 5/Route 57 HOV direct connector. 	<ul style="list-style-type: none"> • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • A proposed project to reconstruct Route 74/Route 5 interchange. Construction will begin in September 2016, and complete in September 2017. Project cost is estimated at \$67.6 million and is funded by STIP RIP and Measure M2. • Construction to add additional general purpose lanes in both directions from Route 73 to El Toro Road. Alternative 2B also proposes to convert the HOV limited access to continuous access. Preliminary engineering and environmental studies are almost complete. The schedule will be finalized as soon as the project scope and cost have been determined. This project is funded by STIP program. Construction will begin in April 2025. • Project EA 0L850 will convert HOV buffer-separated access to continuous access along Route 5 from Route 22/Route 57 interchange to Beach Boulevard. Construction will begin in January 2017, and complete in July 2018. Project cost is estimated at \$5.6 million and is funded by Measure M2. • A project will add a second HOV lane between Route 55 and Route 57 to provide a dual HOV lane facility. Construction will begin in May 2017, and complete in February 2020. Project cost is estimated at \$42 million and is funded by Measure M2. • A proposed project will extend the second HOV lane in both directions between El Toro Road and Alicia Parkway. Construction will begin in March 2020, and complete in September 2024. Project cost is estimated at \$300 million and is funded by Measure M2. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management.

Table 8

DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	5 SB	ORA 38.901	ORA 15.898	2	<ul style="list-style-type: none"> • HOV demand exceeds capacity. • Multiple HOV bottlenecks along the corridor. • Vehicle weaving conflict at ingress/egress locations. • Major bottlenecks at Route 55/Route 5 HOV direct connector and Route 5/Route 57 HOV direct connector. • Traffic impact due to construction activity from the La Paz Interchange Improvement project EA 0H0214. • Second HOV lane drop at Los Alisos Boulevard creates bottleneck. 	<ul style="list-style-type: none"> • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • A proposed project to reconstruct Route 74/Route 5 interchange. Construction will begin in September 2016, and complete in September 2017. Project cost is estimated at \$67.6 million and is funded by STIP RIP and Measure M2. • Project EA 0L850 will convert HOV buffer-separated access to continuous access along Route 5 from Route 22/Route 57 interchange to Beach Boulevard. Construction will begin in January 2017, and complete in July 2018. Project cost is estimated at \$5.6 million and is funded by Measure M2. • A project will add a second HOV lane between Route 55 and Route 57 to provide a dual HOV lane facility. Construction will begin in May 2017, and complete in February 2020. Project cost is estimated at \$42 million and is funded by Measure M2. • A proposed project will extend the second HOV lane in both directions between El Toro Road and Alicia Parkway. Construction will begin in March 2020, and complete in September 2024. Project cost is estimated at \$300 million and is funded by Measure M2. • El Toro Road Interchange improvement project is in PSR phase. The project is planned to complete in June 2024. Project cost is estimated at \$60M and is funded by OCTA. • Construction to add additional general purpose lanes in both directions from Route 73 to El Toro Road. Alternative 2B also proposes to convert the HOV limited access to continuous access. Preliminary engineering and environmental studies are almost complete. The schedule will be finalized as soon as the project scope and cost have been determined. This project is funded by STIP program. Construction will begin in April 2025. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management.

Table 8							
DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	22 EB	ORA R4.368	ORA R8.036	2	<ul style="list-style-type: none"> Vehicle weaving conflict due to speed differential between general purpose lanes and HOV lane. Geometric constraints, major bottleneck at Route 22/Route 5/Route 57 interchange. 	<ul style="list-style-type: none"> District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. A project to remove two-thirds of the existing concrete barrier separating Route 22 and Route 5/Route 57 traffic is in SHOPP. Congestion in the general purpose lanes causes shockwave and slow HOV traffic. Project cost is estimated at \$10 million and is funded by SHOPP. Construction will begin in November 2017, and complete in September 2019. 	<ul style="list-style-type: none"> Improve traffic demand management.
12	22 WB	ORA R4.368	ORA R0.700	2	<ul style="list-style-type: none"> Construction activity for the West County Connector Project EA 07162_ shifted traffic and closed the HOV lane at Knott Street. This has impacted the operation of both the general purpose lanes and HOV lane for this segment. Construction activities at Route 605 and Route 22 interchanges. Construction is scheduled to complete in November 2014. Temporary concrete barriers within the work zone reduce lane width resulting in slower speed. The vehicle detector systems were affected by damaged inductive detector loops during construction, incorrect wire connections, or misalignment from the lane shifts. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> Monitor area and reassess network performance after construction is complete at the Route 605 interchange and Route 22 interchange. The east segment costs approximately \$99.5 million to reconstruct southbound Route 405 to eastbound Route 22 connector. The west segment costs approximately \$146 million and includes connecting the Route 405 HOV lane to the Route 605 HOV lane. Both projects are funded by the Corridor Mobility Improvement Account (CMIA) and Measure M1 funds. District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. 	<ul style="list-style-type: none"> Increase capacity. Improve traffic demand management.

Table 8

DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	55 NB	ORA R6.00	ORA 17.300	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Bottlenecks at Route 55/Route 405 HOV direct connector and Route 5 HOV direct connector. • Mainline bottlenecks at Route 55/Route 22 interchange and Route 55/Route 91 interchange. • The HOV lane ends and connects into the Route 91 express lane. 	<ul style="list-style-type: none"> • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • Proposed lane addition project between Route 405 and Route 5. Alternative 4 proposes to add one HOV lane and additional auxiliary lanes in both directions. Preliminary engineering and environmental studies are currently completing. The schedule will be finalized as soon as the project scope and cost have been determined. Construction will begin in June 2018. Project cost is estimated at \$209.5 million and is funded by Measure M2. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management.
12	55 SB	ORA 17.300	ORA R9.761	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Major bottleneck at Route 55/Route 5 HOV direct connector. • General purpose lanes bottleneck at Route 55/Route 5 interchange. 	<ul style="list-style-type: none"> • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane, and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • Proposed lane addition project between Route 405 and Route 5. Alternative 4 proposes to add one HOV lane and additional auxiliary lanes in both directions. Preliminary engineering and environmental studies are currently completing. The schedule will be finalized as soon as the project scope and cost have been determined. Construction will begin in June 2018. Project cost is estimated at \$209.5 million and is funded by Measure M2. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management.

Table 8							
DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	57 NB	ORA 14.700	ORA 18.600	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Major bottleneck at the Route 91 HOV direct connector. • Traffic impact as a result of construction activities associated to Project EA 0F040, EA 0F031, and EA 0F032. Temporary concrete barriers within the work zone reduce lane width resulting in slower speed. The vehicle detector systems were affected by damaged inductive detector loops during construction, incorrect wire connections, or misalignment from the lane shifts. • Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane, and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • Northbound lane addition from Katella to Lincoln. Construction began in November 2011, and will complete in March 2015. Project cost is estimated at \$30.7 million and funded by CMIA Measure M. Defer action until construction is completed and traffic normalizes. • Northbound lane addition from Orangethorpe to Yorba Linda. Construction began in October 2010, and completed in October 2014. Project cost is estimated at \$58 million and funded by CMIA Measure M. Defer action until construction is completed and traffic normalizes. • Northbound lane addition from Yorba Linda Boulevard to Lambert Road. Construction began in December 2010, and completed in May 2014. Project cost is estimated at \$61.8 million and funded by CMIA Measure M. Defer action until construction is completed and traffic normalizes. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management.
12	57 SB	ORA 18.600	ORA 10.800	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Major bottlenecks at Route 91 interchange and Route 5 interchange. • Traffic impact as a result of construction activities associated to the Route 57 widening project EA 0F032_ from north of Yorba Linda Boulevard to Lambert Road. Temporary concrete barriers within the work zone reduce lane width resulting in slower speed. The vehicle detector systems were affected by damaged inductive detector loops during construction, incorrect wire connections, or misalignment from the lane shifts. • Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane, and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • Defer action until construction is completed and traffic normalizes. The three widening projects on the northbound side include converting southbound HOV lane to continuous access. These three projects have an estimated total cost of \$143 million and are funded by CMIA and Measure M. Construction began in December 2010, and will complete in March 2015. 	<ul style="list-style-type: none"> • Increase capacity. • Minimize vehicle weaving conflict. • Improve traffic demand management.

Table 8							
DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES							
District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	91 EB	ORA 0.864	ORA R9.859	2	<ul style="list-style-type: none"> Vehicle weaving conflict at ingress/egress locations. Major bottlenecks at the Route 5 and Route 57 interchanges. The eastern portion of the HOV lane ends to become a general purpose lane before the start of the express lane. Construction activities along the corridor. The HOV lane ends and becomes the Route 91 express lanes. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. HOV lane will be converted to continuous access as part of a pavement rehabilitation project. Construction began in May 2012, and completed in August 2014. The project costs \$28.6 million and is funded by SHOPP. Convert to continuous access would minimize vehicle weaving conflicts and speed reduction at existing ingress/egress locations. 	<ul style="list-style-type: none"> Improve traffic demand management. Minimize vehicle weaving conflict.
12	91 WB	ORA R9.870	ORA R0.000	2	<ul style="list-style-type: none"> Bottleneck at Route 57 interchange and Route 5 interchange. Vehicle weaving conflict at ingress/egress locations, Beach Boulevard, and at the end of the express lane. Tolloed vehicles transition out of the Route 91 express lane and HOV-2 merge into the HOV lane. Vehicle weaving conflict at ingress/egress locations. Construction activities along the corridor. Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane, and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. HOV lane will be converted to continuous access as a part of a pavement rehabilitation project. Construction began in May 2012, and completed in August 2014. The project costs \$28.6 million and is funded by SHOPP. Convert to continuous access would minimize vehicle weaving conflicts and speed reduction at existing ingress/egress locations. 	<ul style="list-style-type: none"> Improve traffic demand management. Minimize vehicle weaving conflict.

Table 8

DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	405 NB	ORA 0.230	LA 0.000	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Construction activities at Route 605 and Route 22 interchanges. Temporary concrete barriers within the work zone reduce lane width resulting in slower speed. The vehicle detector systems were affected by damaged inductive detector loops during construction, incorrect wire connections, or misalignment from the lane shifts. • Congestion in the general purpose lanes at Route 55 interchange and Route 22 interchange. • Traffic impacts from John Wayne Airport and the South Coast Metro Center, which have large volumes and demands. • Lane drop at Euclid Street creates bottleneck. • Bottleneck at Route 405/Route 55 HOV direct connector. • Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> • A proposed widening project on Route 405 between Route 73 and Route 605 is currently in PA&ED phase. The Project Development Team has recommended Alternative 3 to add one general purpose lane, add one express lane, and convert the existing HOV lane to express lane creating a dual express lane system. PA&ED is scheduled to complete in 2015. Construction will begin in June 2016, and complete in July 2022. Project cost is estimated at \$1.7 billion and is funded by Measure M2 and other funds to be determined. • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • Monitor area and reassess network performance after construction is complete at the Route 605 interchange and Route 22 interchange. The east segment costs approximately \$99.5 million to reconstruct southbound Route 405 to eastbound Route 22 connector. The west segment costs approximately \$146 million and includes connecting the Route 405 HOV lane to the Route 605 HOV lane. Both projects are funded by the Corridor Mobility Improvement Account (CMIA) and Measure M1 funds. • Repair and update detector system to improve data collection. The work is ongoing. Approximately 75 percent of loop detectors are working properly. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management. • Minimize vehicle weaving conflict. • Provide corridor sustainability. • Improve monitoring. Properly operating vehicle detector system will ensure data accuracy.

Table 8

DISTRICT 12 ACTION PLAN STRATEGIES FOR CORRIDORS WITH DEGRADED HOV LANES

District	Route & Direction	Begin County & Post Mile	End County & Post Mile	Minimum Occupancy	Potential Cause(s)	Remediation Strategies	Reason for Strategies
12	405 SB	LA 0.000	ORA 0.230	2	<ul style="list-style-type: none"> • Demand exceeds capacity. • Vehicle weaving conflict at ingress/egress locations. • Traffic impacts from John Wayne Airport and the South Coast Metro Center, which have large volumes and demands. Bottleneck at Route 405/Route 55 direct HOV connector. • Construction activities at Route 605 and Route 22 interchanges. Temporary concrete barriers within the work zone reduce lane width resulting in slower speed. The vehicle detector systems were affected by damaged inductive detector loops during construction, incorrect wire connections, or misalignment from the lane shifts. • Cross-weaving traffic between two ramps contributes to bottleneck between Warner Avenue to Bear Street. • High demand at the on-ramp combined with the high demand on the general purpose lanes contributes to bottleneck from Culver Drive to Route 5. • Issues with the vehicle detector system such as communication and power disruptions. 	<ul style="list-style-type: none"> • A proposed widening project on Route 405 between Route 73 and Route 605 is currently in PA&ED phase. The Project Development Team has recommended Alternative 3 to add one general purpose lane, add one express lane, and convert the existing HOV lane to express lane creating a dual express lane system. PA&ED is scheduled to complete in 2015. Construction will begin in June 2016, and complete in July 2022. Project cost is estimated at \$1.7 billion and is funded by Measure M2 and other funds to be determined. • Proposed HOV direct access ramps at Bear Street overcrossing. PA&ED is scheduled to complete in 2019. Construction to begin in December 2020, and complete in November 2024. Project cost is estimated at \$46 million and is funded by Measure M2. • District 12 is developing an Orange County Managed Lanes Feasibility Study to assess future region-wide development of the HOV network. The study will evaluate and plan for the construction of additional HOV lanes, express lane, and HOV direct access ramps. Project costs and financial information will be included in the final report. The study will be completed in June 2015. • Monitor area and reassess network performance after construction is complete at the Route 605 interchange and Route 22 interchange. The east segment costs approximately \$99.5 million to reconstruct southbound Route 405 to eastbound Route 22 connector. The west segment costs approximately \$146 million and includes connecting the Route 405 HOV lane to the Route 605 HOV lane. Both projects are funded by the Corridor Mobility Improvement Account (CMIA) and Measure M1 funds. • Repair and update detector system to improve data collection. The work is ongoing. Approximately 75 percent of loop detectors are working properly. 	<ul style="list-style-type: none"> • Increase capacity. • Improve traffic demand management. • Minimize vehicle weaving conflict. • Provide corridor sustainability. • Improve monitoring. Properly operating vehicle detector system will ensure data accuracy.