ALI ZAGHARI
Deputy District Director
Caltrans, District 7
Division of Traffic Operations
California law permits ILEV (Inherently Low Emission Vehicles) and previously hybrid vehicles to access HOV lanes

- Yellow decals – hybrid vehicles – 85,000 decals
  - Valid until 07/01/11
- Green Decals - plug-in vehicles 40,000 decals
  - Valid until 01/01/15
- White decals – ILEVs – 19,300 (as of DEC 2011)
  - Valid until 01/01/15
- Requires performance monitoring and reporting on HOV facilities that allow single occupancy vehicles (i.e. hybrids and tolled) to access since 2005

As required by Title 23 USC § 166, Caltrans prepared the “2011 California High-Occupancy Vehicle Lane Degradation Determination Report”

- Analyzes the performance of the HOV network in California
Enacted on July 6, 2012
Requires State DOTs to remedy degraded HOV/HOT facilities within 180 days
Potential sanctions: Loss of Federal funding and project approvals

Definition of Degraded Segment:
- Speed falls below 45 mph during the morning or evening weekday peak hour periods for more than 10% of a 180-day period
- In other word, an HOV facility is considered degraded if its speed falls below 45 mph for 3 weekdays or more each month
Traffic collected from in-ground loop detectors, radars, or microwave vehicle detection systems

Freeway Performance Measurement System (PeMS)
- Separated into multiple segments
- Each segment = 5 miles maximum

Peak Hour Data (typical statewide peak travel delay)
- Morning – 8:00 am to 9:00 am
- Evening – 5:00 pm to 6:00 pm

Degradation status data include two 180-day periods (weekday data, including weekday holidays)

The first 180-day period is Jan. 1, 2011 to June 30, 2011
- 129 weekdays and 52 weekend days

The second 180-day period is July 1, 2011 to Dec. 31, 2011
- 131 weekdays and 53 weekend days

\[
\text{Speed} = \frac{\text{Total vehicle miles traveled}}{\text{Total vehicle hours traveled}}
\]
Caltrans categorized degradation into three classes:
  - Slightly degraded
  - Very degraded
  - Extremely degraded

<table>
<thead>
<tr>
<th>Federally &quot;Degraded&quot;</th>
<th>Degradation Severity</th>
<th>Percent of 180 days failing to maintain 45mph for either Morning or Evening peak hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extremely Degraded</td>
<td>75% or higher</td>
</tr>
<tr>
<td></td>
<td>Very Degraded</td>
<td>50%-74%</td>
</tr>
<tr>
<td></td>
<td>Slightly Degraded</td>
<td>10%-49%</td>
</tr>
</tbody>
</table>
### 2011 Statewide HOV Network Degradation Summary

<table>
<thead>
<tr>
<th></th>
<th>First 180-day Period January to June 2011</th>
<th>Second 180-day Period July to December 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Degraded</td>
<td>43%</td>
<td>49%</td>
</tr>
<tr>
<td>Not Degraded</td>
<td>57%</td>
<td>51%</td>
</tr>
<tr>
<td>Morning Peak Hour Degradation</td>
<td>20%</td>
<td>23%</td>
</tr>
<tr>
<td>Morning Peak Hour Severity</td>
<td>13% Slightly Degraded 7% Very or Extremely Degraded</td>
<td>19% Slightly Degraded 4% Very or Extremely Degraded</td>
</tr>
<tr>
<td>Evening Peak Hour Degradation</td>
<td>24%</td>
<td>40%</td>
</tr>
<tr>
<td>Evening Peak Hour Severity</td>
<td>19% Slightly Degraded 15% Very or Extremely Degraded</td>
<td>25% Slightly Degraded 15% Very or Extremely Degraded</td>
</tr>
</tbody>
</table>
Statewide Degradation Summary by Peak Hour
(July 1 - December 31, 2011)

- Morning only degraded: 153.4 lane-miles (12%)
- Morning & evening degraded: 141.2 lane-miles (11%)
- Evening only degraded: 362.0 lane-miles (27%)
- Not degraded: 669.9 lane-miles (50%)
Statewide Degraded HOV Lane-Miles Summary by District (July 1 - December 31, 2011)

Note: 1326.5 lane-miles total; numbers may not add up due to rounding
Potential Causes of Degradation

Potential Causes

- Congestion in general purpose (GP) lanes
  - Weaving conflict at ingress/egress (I/E) locations → congests the HOV lane due to speed differential
  - Lane drops create congestion on the mainline which effects the HOV operation
- Construction activities
- Faulty vehicle detector system
- Major Bottlenecks on the mainline
- Merging Problems
- HOV volume exceeds capacity
- HOV violations
Caltrans has been working very closely with FHWA for many years towards understanding the causes and identifying most effective strategies to remedy degradation levels.

The proposed Action Plans Strategies were developed by the District with input from Caltrans HQ and FHWA-California Division.

Remediation Strategies

- **Short Term**
  - Improve mainline operation by removing lane drops through Restriping
  - More assertive ramp and connector metering operation
  - In partnership with Metro, Enhance Freeway Service Patrol (FSP) operation/deployment.
  - Work with CHP to improve enforcement and incident management
  - Improve HOV vehicle detection infrastructure

- **Long Term**
  - HOV Direct Connectors
  - Increase occupancy in conjunction with HOT conversion in HOV facility where adding an additional lane is feasible (I-105)
In 2011, California HOV lanes carried about 13% of the traffic on the freeway during the morning peak hour and 15% during the evening peak hour.

Overall increase in congestion in the latter half of the year, particularly after school begins in the late summer.

Recurrent congestion or other factors could be causing degradation.

The 2011 HOV Degradation Report and Action Plan were developed in compliance with federal laws.

The 180-day timeframe to remediate degradation begins when the report was submitted to the FHWA, on August 1st, 2013.

Our long record of working closely with FHWA will help us to continue to find efficient and effective solutions to HOV degradation challenges.
Awaiting for official response from FHWA. Anticipated to be received in September 2013

2012 Degradation Report is currently in progress

Additional studies may be needed.
THANK YOU

QUESTIONS OR COMMENTS?

Ali Zaghari
Deputy District Director, Caltrans District 7
Division of Traffic Operations
Email: Ali.Zaghari@dot.ca.gov