



# **DISTRICT 12 HOV** **DEGRADATION**



**Orange County Transportation Authority**  
Board of Directors Meeting

April 8, 2013

## **Moving Ahead for Progress in the 21st Century**

- Enacted on July 6, 2012
- Requires a degradation study per 23 USC § 166 (d)
- Requires State DOTs to remedy degraded HOV/HOT lanes (180 days)
- Potential sanctions: Loss of Federal funding and project approvals

### **Definition of HOV & Degraded Segment:**

- High-Occupancy Vehicle lane, or carpool lane
- Speed falls below 45 mph for 10% or more of the morning or evening weekday peak hour periods over a consecutive 180-day period

**HOV lane demand is exceeding capacity resulting in degradation. People are using HOV lanes.**

# Benefits of HOV Lanes

- **Saves travel time and improves trip reliability**
- **Provides commuters an alternative**
- **Moves more vehicles (during peak, congested conditions)**
  - 1 GP lane carries 1,400 vehicle per hour per lane (vphpl) (2,000 at free flow)
    - *AVO\* is 1.1*
  - 1 HOV lane carries 1,500 vphpl
    - *AVO is 2.2*
  - 2 HOV lanes carry 1,700 vphpl
    - *AVO is 2.2*
- **Moves more people**
  - 1 GP lane = 1,540 people/hour/lane
  - 1 HOV lane = 3,300 people/hour/lane
  - 2 HOV lanes = 3,740 people/hour/lane



\*AVO = Average Vehicle Occupancy

## Peak Period (Congested) Vehicles and People Throughput

Lane Type	No. of Lane(s)	Vehicle Production (Throughput) (veh/hr)	Occupancy Rate	People/hr
HOV	1	1,500	2.2	3,300
GP	1	1,400	1.1	1,540
HOV	2	1,700	2.2	7,480*
GP	2	1,400	1.1	3,080
GP	3	1,400	1.1	4,620
GP	4	1,400	1.1	6,160
GP	5	1,400	1.1	7,700

Notes:

•Peak hour volume for 2 HOV lanes =  $2 \times 1,700 \times 2.2 = 7,480$  people/hour

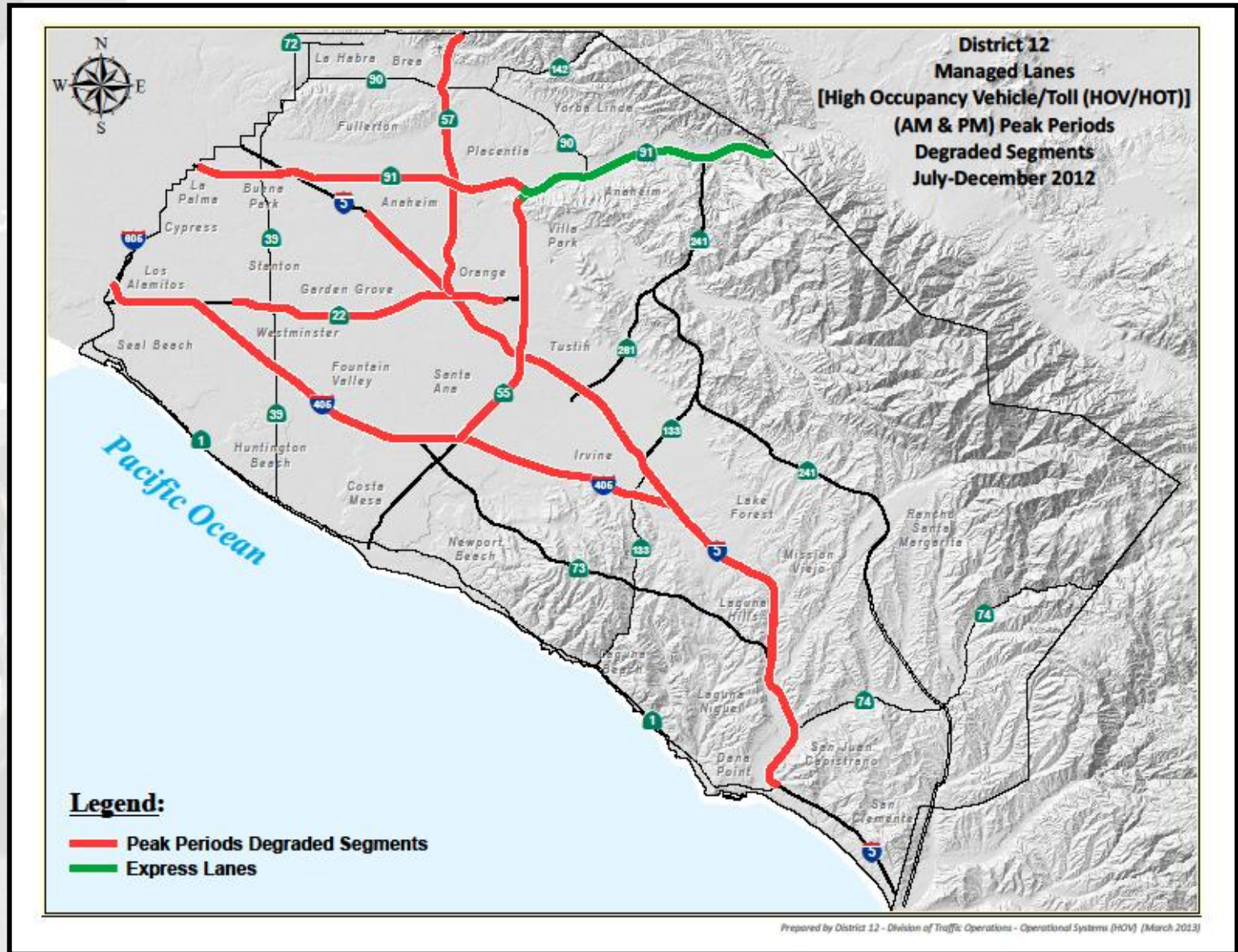
# Orange County HOV Lane Map



Prepared by District 12 - Division of Traffic Operations - System Planning Branch (March 2013)



# Orange County HOV Lane Degradation Map



Prepared by District 12 - Division of Traffic Operations - Operational Systems (HOV) (March 2013)

# Least Effective Solutions to Address Degradation and Corridor Throughput

SOLUTION	PRO	CON
<b>1. Increase enforcement</b>	Address perceived lack of enforcement by public Serves as deterrent to violators	Limited congestion relief Require supplemental funding for periodic enforcement
<b>2. Increase HOV violation fine</b>	Reduce violation	Limited congestion relief
<b>3. Prohibit Inherently Low Emission Vehicles (ILEV)</b>	Minimal congestion relief in the HOV lanes	Increase congestion in GP lanes Counter to air quality strategies
<b>4. Provide direct access to HOV lanes and connectors</b>	Reduce weaving maneuver Remove pressure on nearby interchanges	Additional capital costs
<b>5. Peak period 3+</b>	Relieve congestion in the HOV lanes	Empty lane syndrome Increase congestion in GP lanes Implementation challenges

## Most Effective Solutions to Address Degradation and Corridor Throughput

1. **Raise occupancy (3+) (one lane)**
2. **Raise occupancy (3+) and convert to HOT (one lane)**
3. **Add second HOV lane (2+) (two lanes)**
4. **Add second HOV lane and convert to HOT (2+) (two lanes)**
5. **Add second HOV lane and convert to HOT, raise occupancy to (3+) (two lanes)**



# Most Effective Solutions to Address Degradation and Corridor Throughput

SOLUTION	PRO	CON
<b>1. Raise occupancy (3+) (one lane)</b>	Eliminate degradation	Empty lane syndrome Near-term congestion in GP lanes Perceived take-away
<b>2. Raise occupancy (3+) and convert to HOT (one lane)</b>	Same as (1) Improved travel time reliability Move more vehicles Manages congestion Potential revenue for corridor	Same as (1) May eliminate future ML options Tolling resistance Limited funding
<b>3. Add second HOV lane (2+) (two lanes)</b>	Same as (1) Improved travel time reliability Improved incident response Move more people and vehicles Allows 2+ to stay in lanes	Limited funding Potential right-of-way impact Near-term empty lane syndrome
<b>4. Add second HOV lane and convert to HOT (2+) (two lanes)</b>	Same as (2) and (3) Allows 2+ to stay in HOT lanes	Same as (3) Tolling resistance
<b>5. Add second HOV lane and convert to HOT Raise Occupancy to (3+) (two lanes)</b>	Same as (1) and (2) Improved incident response Move more people Greater options for single occupant vehicles	Same as (1), (3) and (4)

# Recommendations to Address Degradation & Corridor Throughput

## Long-Term

- **Add HOV lanes or HOT lanes (creating a two-lane system)**

As project opportunities arise

Subject to funding availability

## Short-Term

- **Convert existing HOV lanes to HOT lanes and increase occupancy from 2+ to 3+**

Where long term options are not feasible

Where GP capacity is added to corridor (ideal)

Create a two-lane system when available

# THANK YOU

## QUESTIONS OR CONCERNS?

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