



DISTRICT 12 HOV **DEGRADATION**



Orange County Transportation Authority
Board of Directors Meeting

April 8, 2013

- 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

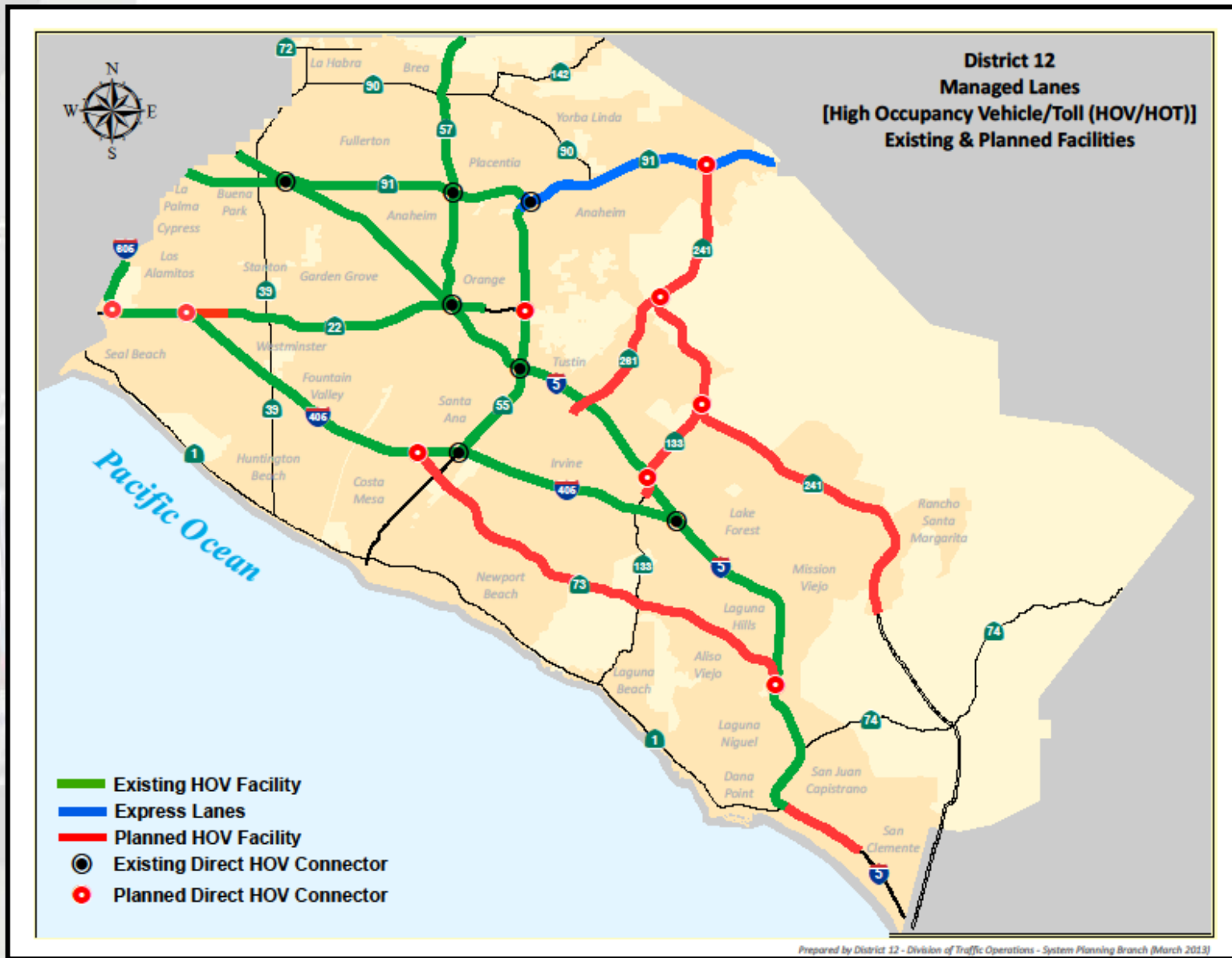
Peak Period (Congested) Vehicles and People Throughput

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:

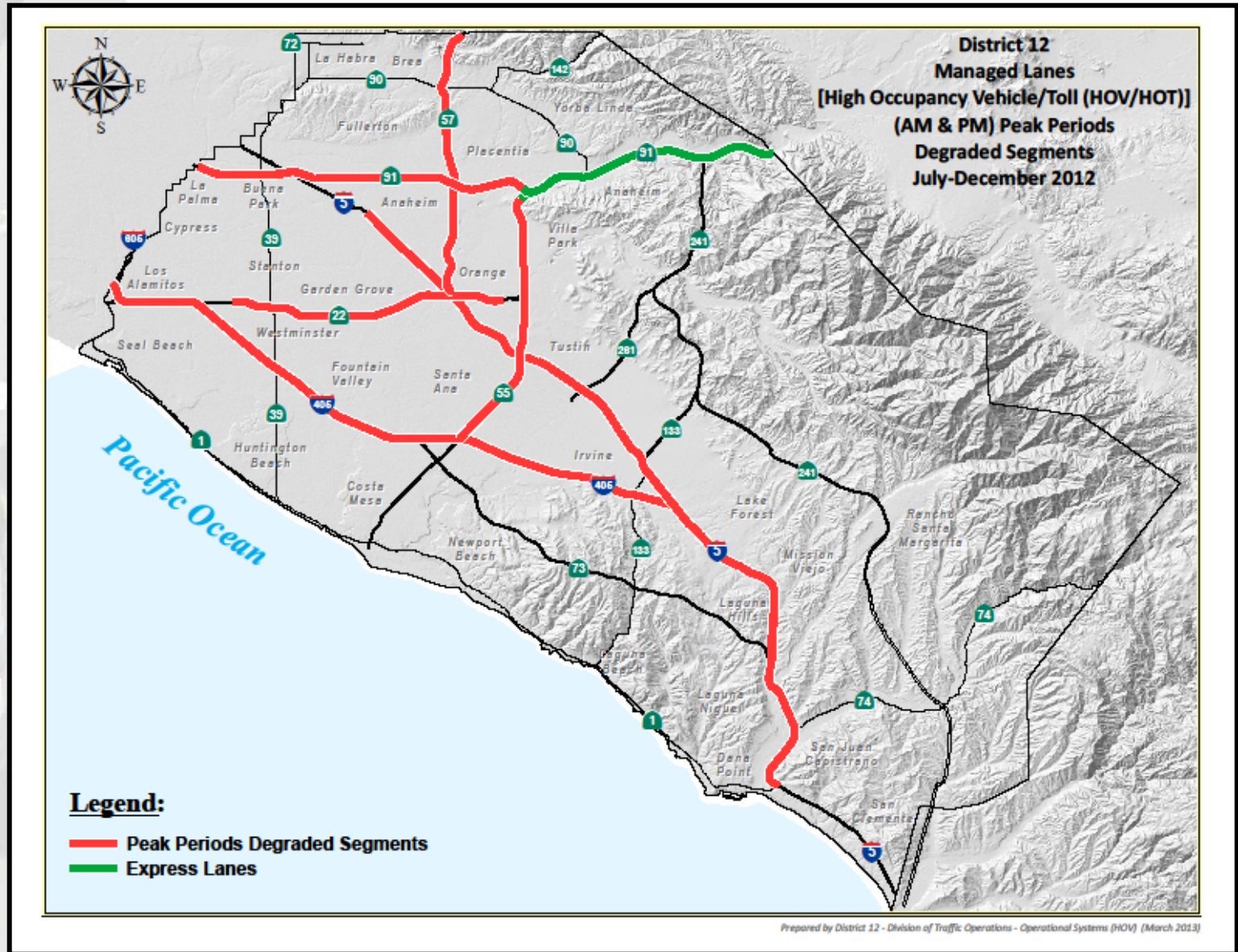
- Peak hour volume for 2 HOV lanes = $2 \times 1,700 \times 2.2 = 7,480$ people/hour

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
1. Increase enforcement	Address perceived lack of enforcement by public Serves as deterrent to violators	Limited congestion relief Require supplemental funding for periodic enforcement
2. Increase HOV violation fine	Reduce violation	Limited congestion relief
3. Prohibit Inherently Low Emission Vehicles (ILEV)	Minimal congestion relief in the HOV lanes	Increase congestion in GP lanes Counter to air quality strategies
4. Provide direct access to HOV lanes and connectors	Reduce weaving maneuver Remove pressure on nearby interchanges	Additional capital costs
5. Peak period 3+	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
1. Raise occupancy (3+) (one lane)	Eliminate degradation	Empty lane syndrome Near-term congestion in GP lanes Perceived take-away
2. Raise occupancy (3+) and convert to HOT (one lane)	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
3. Add second HOV lane (2+) (two lanes)	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
4. Add second HOV lane and convert to HOT (2+) (two lanes)	Same as (2) and (3) Allows 2+ to stay in HOT lanes	Same as (3) Tolling resistance
5. Add second HOV lane and convert to HOT Raise Occupancy to (3+) (two lanes)	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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