



High Occupancy Vehicle Lanes

Santa Clara County, California

HOV Pooled Fund Study
2007 Annual Meeting
June 21, 2007

Presentation Outline

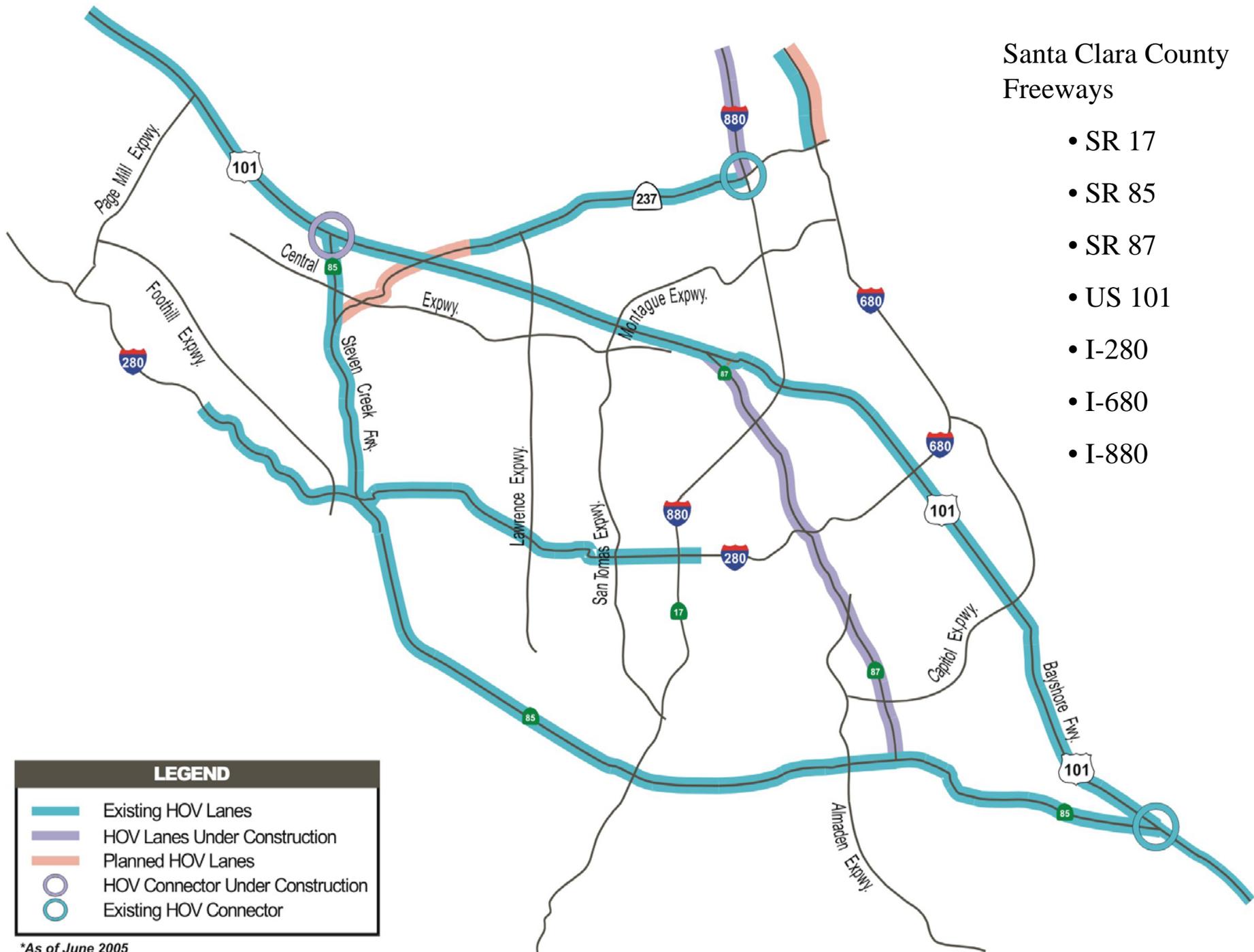
- Background information on Santa Clara County and VTA
- Planning, funding, development of carpool lanes in Santa Clara County
- Ten facts about carpool lanes in Santa Clara County

Background Information on Santa Clara County

- Most populous county in the Bay Area with over 1.8 million residents (25% of Bay Area 7.2 million)
- Nearly 1.2 million autos registered in County (25% of Bay Area 4.5 million autos)
- 262 miles of State highways in County (18% of Bay Area 1432 miles)
- 4.8 million miles of roadways in County (22% of Bay Area 21.4 million miles)
- City of San Jose is the most populous city in the Bay Area with a population of over 900,000 (10th largest in U.S. and 3rd largest in California)

Santa Clara County Freeways

- SR 17
- SR 85
- SR 87
- US 101
- I-280
- I-680
- I-880



Santa Clara County Expressways

- Almaden
- Capitol
- Central
- Foothill
- Lawrence
- Montague
- Page Mill/ Oregon
- San Tomas



LEGEND	
	Existing HOV Lanes
	HOV Lanes Under Construction
	Planned HOV Lanes
	HOV Connector Under Construction
	Existing HOV Connector

*As of June 2005

Background Information on VTA

- VTA is a special district formed by the merger of the Santa Clara County Transit District and the Santa Clara County Congestion Management Agency (CMA) in 1995
- VTA Board includes council members from the 15 cities and towns and County supervisors; 12 voting members in total

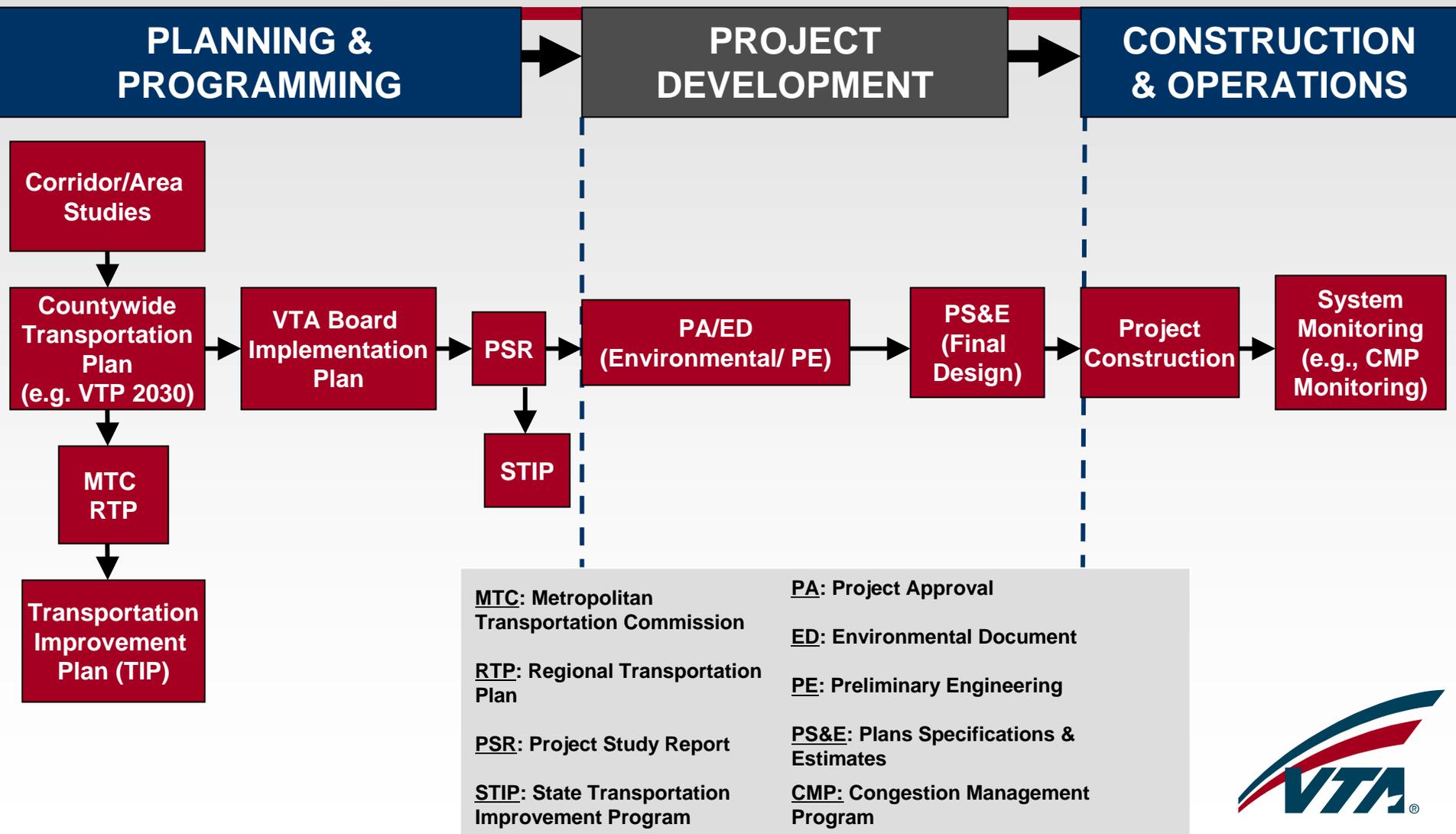
Background Information on VTA

- VTA is a one-stop agency that
 - operates and maintains transit services
 - serves as the county CMA
 - conducts countywide planning (roadways, transit, bicycling, pedestrian, and ITS)
 - coordinates activities with the Bay Area MPO
 - designs/constructs transit and highway projects
 - operates a transit oriented development program

Background Information on VTA

- Light rail service: first service in 1987; two main lines covering over 42 miles; 62 stations; 21 PnR lots with 6500 spaces; about 30 to 40 cars in service during peaks; 15-minute headways in peak; adult fare is \$1.75; 8.3 million riders in 2006 (over 26,000 per day)
- Bus service: active fleet of 440 buses; 70 routes (includes 15 express bus and 1 rapid bus routes); 1378 round trip route miles; 4330 stops; 742 shelters; 8 PnR lots with 560 spaces; adult fare is \$1.75; 30.9 million riders in 2006 (100,000 per day)
- Paratransit service: contracted to local non-profit agency; provides transit to over 10,000 seniors and disabled adults
- Service provided in three languages: English, Spanish and Vietnamese
- Eco Pass Program: allows employers pay lump sum for transit passes for all employees
- 80% of county residents live within a quarter mile of a transit route
- Web site: www.vta.org

Highway Project Planning & Development Process



Ten Facts about Carpool Lanes

- Ten Facts about Carpool Lanes in Santa Clara County
 - **10.** Home to almost half of Bay Area carpool lanes
 - **9.** 85 of 360 on-ramps have HOV By-pass lanes
 - **8.** Another 50 lane miles of carpool lanes on County expressways
 - **7.** HOV Lane Performance measures use to redesignate some expressway HOV lanes
 - **6.** Three key issues identified with under-performing expressway HOV lanes

Ten Facts about Carpool Lanes

- Ten Facts about Carpool Lanes in Santa Clara County
 - **5.** Redesignation of expressway HOV lanes will result in funding loss to VTA
 - **4.** Annual monitoring of freeways by VTA conducted using aerial photography
 - **3.** County has system of well-connected freeway HOV lanes, including three freeway-to-freeway carpool connectors
 - **2.** Detailed study and development of pricing of carpool lanes underway in County
 - **1.** California Highway Patrol (CHP) would see the development of a way to determine to the number of occupants in a vehicle as a major win

Ten Facts about Carpool Lanes

- Fact #10: There are about 174 directional miles of freeway carpool lanes in Santa Clara County (almost half the Bay Area total)

Facility	From	To	Location	Directional Miles
SR 85	US 101	US 101	San Jose	48
			Los Gatos	
			Campbell	
			Saratoga	
			San Jose	
			Cupertino	
			Sunnyvale	
			Los Altos	
SR 87	US 101	Taylor Street	San Jose	18
US 101	Whipple Avenue	Santa Clara County Line	Redwood City	14
			East Menlo Park	
	Santa Clara County Line	Cochrane Road	East Palo Alto	70
			Palo Alto	
			Palo Alto	
			Mountain View	
			Sunnyvale	
SR 237	McCarthy Boulevard	Mathilda Avenue	Santa Clara	12
			San Jose	
			Milpitas	
			Sunnyvale	
I-280	Magdalena Avenue	Meridian Avenue	Los Altos Hills	22
			Los Altos	
			Cupertino	
			Sunnyvale	
			Santa Clara	
I-880	SR 237	Dixon Landing	Milpitas	4



Ten Facts about Carpool Lanes

- Fact #9: There are 360 on-ramps on the 7 Santa Clara County freeways.
 - **Of these, 85 have an HOV Bypass lane**
 - Of these, 36 are at metered ramps and 49 are at unmetered ramps

Related Fact #9a: 116 of the ramps have meters operational (almost half of all operational meters in Bay Area).

- Another 101 ramps have partial or full installation of metering equipment that could be activated
- There are about 235 operational ramp meters in the Bay Area

Ten Facts about Carpool Lanes



- Fact #8: There are another approximate 50 lane miles of carpool lanes on County expressways.
 - Located to the right
 - First HOV lane in 1982 on San Tomas Expressway
 - 2003 County study recommended conversion of some HOV segments to general purpose use



Ten Facts about Carpool Lanes

- Fact #7: Decision to redesignate some Expressway HOV lanes based on HOV Lane Performance Measures documented in Section 5 of Comprehensive County Expressway Planning Study (www.expressways.info).
 - Minimum vehicular flow rate
 - Minimum person flow rate
 - Minimum lane productivity ratio
 - Maximum violation rate
 - Minimum travel time savings (compared to GP lanes)

Table 5-2: HOV Lane Performance Measures

Performance Measure	Freeway Standard	Expressway Standard	How Expressway Standard Determined
Total vehicles per peak hour	Minimum of 800	Minimum of 400	Converted the freeway standard to take into account the lower capacity on expressways due to slower speeds and signals.
Total persons per peak hour	Minimum of 1,800	Minimum of 880	Based on the average occupancy of 2.2 people per vehicle in the expressway HOV lanes.
Lane Productivity (ratio of people in HOV lane to mixed-flow lane)	No standard set; however, could be considered at least 1.0 ⁽¹⁾	Minimum of 0.80 to 0.90	Around this range of productivity, the impact of converting the HOV lane to mixed flow would lead to no net increase in capacity if a significant number of HOV users return to single-occupant vehicles.
Violation Rates	No higher than 10%	No higher than 15%	A higher violation rate standard was set due to the right lane position of the HOV lane.
Travel Time Savings	At least 1 minute per mile savings over mixed-flow lane	Travel time to be equal or better than mixed-flow lane	Due to differing operating conditions, a minimum travel time savings standard comparable to the freeway standard cannot be established. ⁽²⁾ However, lack of any travel time benefit is indicative of operational problems.

Notes:

- 1) The "Lane Productivity" measure was established by MTC for use in the regional *2002 HOV Lane Master Plan Update*. The report notes that all freeways in the Bay Area, except one, has a productivity ratio of at least 1.0 and several of the freeway HOV lanes have productivity ratios of 2.0 and 3.0 (i.e., double and triple the people in an HOV lane compared to a mixed-flow lane).
- 2) With signals approximately every half mile, the primary benefit of expressway HOV lanes is shorter queues at the signal as opposed to freeway travel where the primary benefit is being able to travel at a faster speed.

Figure 5-1: HOV System Recommendations



Ten Facts about Carpool Lanes

- Fact #6: Three key issues identified with under-performing Expressway HOV lanes.
 - Lack of access control and close spacing of intersections/on-ramps leading to weaving conflicts and high violation rates
 - Parallel freeway HOV lanes that offer more travel time savings and convenience for longer commutes
 - Travel time advantage with right-hand HOV lane concept due to lane sharing with right-turning vehicles in lane near intersections

Ten Facts about Carpool Lanes

- Fact #5: Redesignation of expressway HOV lanes will result in funding loss to VTA.
 - VTA receives federal Fixed Guideway Funds for operating buses in HOV lanes.
 - Converting HOV lanes will result in loss of operating revenue for VTA transit
 - Loss of \$40,000 per year for Lawrence Expressway HOV segment removal
 - Loss of \$220,000 per year for Montague Expressway HOV segment removal

Ten Facts about Carpool Lanes

- Fact #4: Annual monitoring of freeways by VTA conducted using aerial photography
 - Congestion Management Program (CMP) monitoring of CMP network
 - Annually report Level of Service (LOS) based on density
 - Count cars from aerial photographs to determine density
 - LOS reported for freeway GP lanes and for HOV lanes segments

Morning Commute

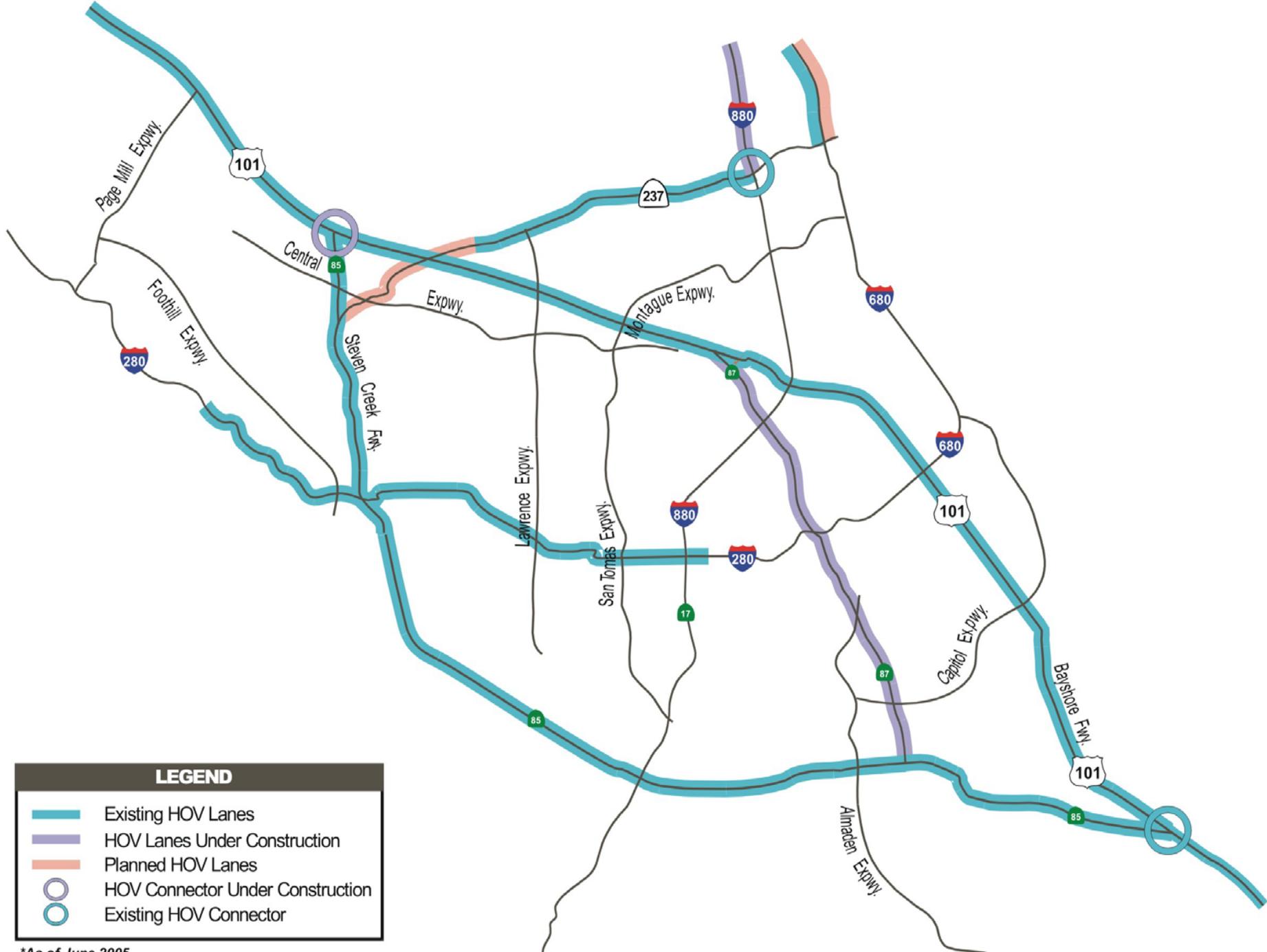
SR 85

HOV Lane Connector

GP Lane Connector

US 101





LEGEND

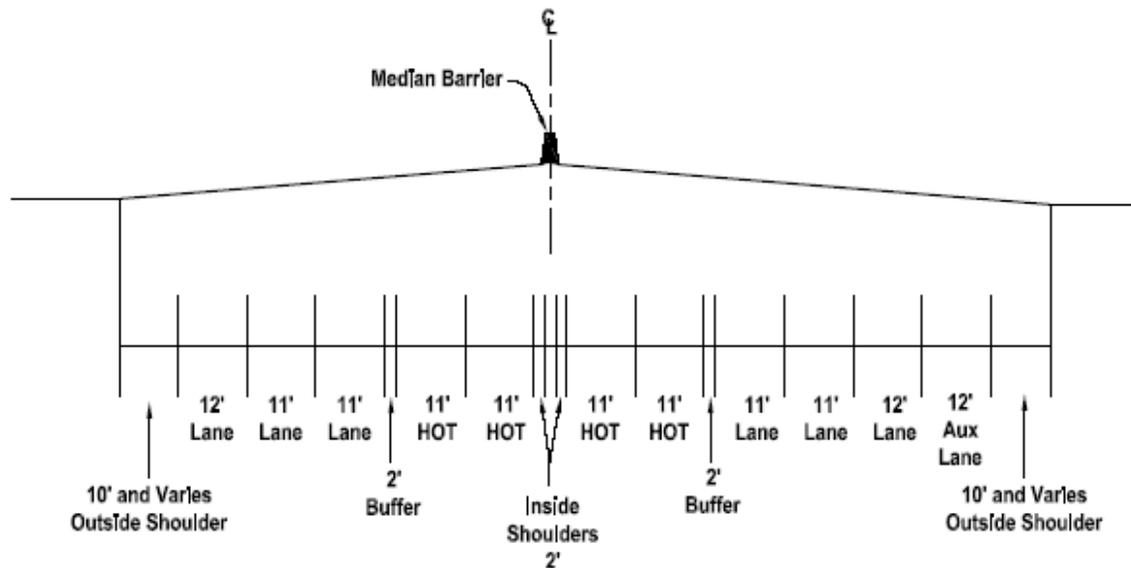
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*As of June 2005

Ten Facts about Carpool Lanes

- Fact #2: Detailed study and development of pricing of carpool lanes underway in County.
 - Feasibility study completed in 2005 that examined all freeway HOV lanes
 - Work advancing on study of SR 85 and US 101; if both freeways are priced, would have almost 70 directional miles of HOV/HOT lanes
 - Conducting preliminary engineering that would be completed in Fall 2008
 - Freeway-to-freeway pricing would take advantage of already constructed direct carpool lane connectors (\$210 million for two interchange improvements funded by county sales tax measure; design and construction by VTA)
 - Long-term plan would be two HOV/HOT lanes in each direction with striped separation from GP lanes similar to Southern California HOV lanes

Ten Facts about Carpool Lanes



CONCEPTUAL 2 HOV/HOT LANES CONFIGURATION

Ten Facts about Carpool Lanes

- Fact #1: California Highway Patrol (CHP) would see the development of a way to determine the number of occupants in a vehicle as a significant achievement.
 - A major issue for CHP is stopping a vehicle in a carpool lane that turns out to have the requisite number of passengers
 - The equipment for detecting the number of passengers would need to fit into a small space in the CHP squad cars
 - Finding a solution for this problem would be viewed as a major win by CHP



Not much room
available in patrol
vehicle



The End