

million. A rail line is located in the median of this facility through part of the project.

- The Harbor Freeway Transitway is currently under construction. This facility includes a 1.3 mile elevated "T" section that will carry two northbound and two southbound bus and carpool lanes. It also includes on-line transit stations. The Harbor Freeway Transitway is scheduled to open in July of 1995.

- The Los Angeles Route 14 HOV lane was initiated during the recent Northridge Earthquake. Carpools are allowed to use the outside shoulder of what was a truck connector in the northbound direction. In the southbound direction, the number one freeway lane was used as an HOV lane when the facility was reopened. HOV use on these lanes has exceeded 2,000 vehicles per hour.

There are approximately 65 miles of existing HOV lanes in the Los Angeles County, with an additional 40 miles under construction. Further, 115 miles of HOV lanes are in the design stage and 125 miles are in the planning process. Other measures are also being used to provide an integrated transportation system. Other elements include ramp metering, HOV bypass lanes, traffic system management and traffic operations systems, IVHS technologies, freeway service patrols, bus, rail, and carpools.

These efforts have been planned, funded, implemented, and are being operated through the joint efforts of Caltrans, MTA, counties, local governments, and other groups. This coordinated approach will continue to be needed to ensure that the system is developed and operated efficiently. Some of the challenges currently being faced in the area include obtaining media, political, and public support, right-of-way acquisition, maintaining traffic flow during construction, and nighttime construction. I am sure many other states are facing similar issues. I hope we will have the opportunity to discuss them during the conference this week and share ideas on ways to address them.

## Orange County's HOV Program

*Joseph Hecker, California Department of Transportation*



On behalf of the Orange County portion of Caltrans, it is a pleasure to welcome you to this conference. I appreciate the opportunity to provide you with an overview of the HOV facilities in Orange County. Until 1988, Orange County was part of the 3-county Los Angeles Caltrans District. In 1988, Orange County became a separate district.

Orange County is located approximately 20 miles to the South of Los Angeles. Given the diverse home and work locations of commuters, and the numerous attractions in the area, traffic congestion is a major problem at all times. The rapid growth in population and the corresponding growth in vehicle registration has created a great demand for additional roadway capacity. For example, it has been estimated that the annual average daily traffic increased by 250 percent between 1966 and 1986.

Both Caltrans and the Orange County Transportation Authority (OCTA) recognized the need to explore long-term solutions to this rapid growth. HOV systems were viewed as important elements of this plan. The requirements of the Clean Air Act Amendments of 1990, as well as the financial cost of expanding existing facilities, provided additional challenges in this effort. Caltrans and OCTA responded with a county-wide interconnected HOV system. The focus of this system was to provide travel time savings and more reliable trip times to HOVs. Thus, freeway-to-freeway connectors and drop ramps were given equal priority with additional lanes. All of the freeways in the county will eventually have HOV lanes, and most will have freeway-to-freeway HOV direct connections.

Currently, 110 directional miles of HOV lanes are in operation on freeways in the county, along with 92 HOV bypass lanes at entrance ramp meters. One HOV drop

ramp is in operation, two are under construction, and four more are in the planning stage. There are four freeway-to-freeway HOV connectors under construction and eight in planning. HOV lanes are in operation on I-405, I-5, Route 55, and Route 57. The HOV lanes in the I-405 corridor extend 48 directional miles, which makes it one of the longest full-time HOV lanes in the county. There are also 62 directional miles of HOV lanes under construction. These facilities should be operational by mid-1996. An additional 50 miles, which is currently in design, should be operational by 2000. With the addition of the HOV lanes being planned on three toll facilities, the county should have a total of 353 directional miles of HOV lanes in operation by 2001.

The requirements placed on air quality non-attainment areas, of which the greater Los Angeles metropolitan area is the only extreme classification, limit the types of freeway projects that can be constructed. The HOV lanes are being used to help address these issues. A combination of federal and state funding is being used, along with private funding for the toll road projects. The toll road projects include the use of congestion pricing techniques to encourage carpooling, vanpooling, and transit use.

To date, the HOV projects in the county have been developed and implemented through the joint efforts of Caltrans, the OCTA, the Transportation Corridor Agency (TCA), FHWA, FTA, and the private sector. This joint effort has been successful at developing a long-range approach to addressing the mobility needs in the area. This has helped Orange County become a transportation leader. A short video highlighting the HOV system from the perspective of a user was shown.

### **HOV System Operations and Plans for the Bay Area**

*H. David Seriani, California Department of Transportation*



Thank you, Art. It is a pleasure to have the opportunity to discuss the HOV facilities in the San Francisco Bay area this morning. For those of you who are not familiar with the Bay area, it consists of nine counties. San Francisco—which is located just south of the famous Golden Gate Bridge—Marin, Napa, and Sonoma to the north; San Mateo, Santa Clara, and Santa Cruz to the south; and Alameda and Contra Costa to the east. Caltrans District 4 covers the nine county area. Approximately 155 lane-miles of the HOV lanes are in operation in the District, with another 65 lane-miles under construction. Some 12 lane-miles of the existing HOV lanes are being modified. In addition, about 78 lane-miles are programmed within the next five years.

All of the HOV lanes in District 4 are contiguous part-time lanes with no buffers between the HOV lane and the mixed flow lanes. The lanes revert to general purpose use—open to all vehicles—during the non-peak hours. The minimum occupancy requirements for all of the HOV facilities—except the San Francisco/Oakland Bay Bridge—is two or more persons per vehicle (2+). Toll free passage for vehicles with three or more persons (3+) is allowed on the Golden Gate Bridge from 5:00-9:00 A.M. and from 4:00-6:00 P.M. In addition, there are about 26 lane-miles of HOV lanes in operation on expressways. These are under the control of Santa Clara County. An additional 51 lane-miles are planned on the Santa Clara County Expressway by the year 2005. In addition, there are 11 HOV bypass lanes in the District, with another 56 HOV lanes programmed for the future.

The District 4 HOV program started in 1970 on the Bay Bridge. Originally opened as a bus-only lane, carpools were soon allowed to use the lane. Three major freeways—Routes 80, 580, and 880—serve the Bay Bridge, which is a double deck bridge with the westbound lanes on the upper deck and the eastbound lanes on the lower deck. There are five lanes in each direction of travel. Annual average daily traffic for the bridge is about 250,000. In 1982, metering lights were installed just downstream of the toll plaza to help control peak-period demand.

The Bridge has four HOV lanes in the westbound direction—two on the left side and two on the right side of the toll plaza. These lanes carry about 38 to 50 percent of all the people over the Bay Bridge in the morning peak hours. The HOV lane users bypass the metering lights and congestion at the toll plaza, saving about 15 to 20 minutes. In addition, HOVs do not have to pay the toll charge. The left hand side lanes revert back to normal toll operation in the off-peak hours, and the right hand side lanes are bus-only lanes during the off-peak hours. The Metropolitan Transportation Commission (MTC) is considering increasing the toll on this bridge.