

demand management needs of the future. An HOV system provides commuters with the incentives of reduced travel times, improved trip reliability, and reduced costs. Further, it will encourage ridesharing.

The 14 million people living in the Los Angeles Basin own 6 million cars. Travel between counties in the area is so essential that transportation planning must consider the surrounding counties, which includes an area of approximately 12 thousand square miles. The total population of the region is expected to increase to between 21 and 23 million over the next 16 years. The number of daily vehicle trips will top 60 million, in 1990. HOV lanes and busways are two techniques that can be used to turn the Los Angeles mobility problem around. Everyone benefits from HOV lanes and busways through improved air quality, reduced congestion, and energy savings. In the long run this will help improve the quality of life in the region.

Developing, Implementing, and Operating an HOV Program for the Los Angeles Area

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Good morning and welcome to Los Angeles. There are over nine million people living in Los Angeles County. Approximately three million people commute to the central business district (CBD) on a daily basis. The freeway system in the county is over 500 miles, which represents only half of the system projected in the mid-1950s. The number of vehicles continue to increase in the region. As a result of these two factors, Los Angeles has some of the busiest freeways in the world.

The development of the HOV system in Los Angeles began in the early 1970s with the opening of the El Monte Busway. As Jerry mentioned, the Santa Monica Diamond Lane project, which converted an existing general purpose lane into an HOV lane, probably set HOV lane

development in Los Angeles back ten years. If this project had not failed, the development of the HOV system would have occurred much sooner. The next HOV lane was opened about ten years later. Since then, research and engineering studies have guided the development of an HOV system in the region.

A video on the HOV system in Los Angeles was presented. The major highlights from this video included the following.

- The El Monte Busway opened in 1974. Initially opened to buses only, carpools of three or more passengers (3+) were allowed to use the busway starting in 1976. The facility is 11 miles in length and cost \$60 million to construct. The facility provides an HOV lane in each direction of travel. The HOV lanes are separated from the adjacent general purpose lanes by a 14-foot buffer.

- A circular bus station is located at the eastern end of the busway, providing direct access to the busway. A major park-and-ride lot is located around the station. A fly over access ramp is provided at Del Mar Avenue. The station at California State University, Los Angeles features a split roadway and a sky bridge.

- The extension of the busway into downtown Los Angeles, which was built 12 years later, cost \$18 million. It provides access to the downtown street system without returning to the freeway.

- The Route 91 demonstration project re-stripped the median to provide an HOV lane. The eastbound lane cost \$250,000 for eight miles when it opened in 1985. The westbound lane opened in 1993 and cost \$1.1 million.

- The Route 405 (San Diego Freeway) HOV lane opened in 1993. All lanes are 11-foot and the buffer is a 1-foot double yellow line. This facility is being extended north through the interchange with I-105.

- The I-105 (Glen Anderson or Century Freeway), which is 17.3 miles long, will probably be the last new freeway to be constructed in Los Angeles. The facility cost \$2.3 billion. It includes three general purpose lanes, one HOV lane, and a rail line in each direction. There are also six enforcement areas and six ingress/egress points in each direction. There are also direct connections to the future Harbor Freeway Transitway. These are referred to as the fifth level of a four level interchange.

- The HOV lanes on the Route 210 Foothill Freeway opened in January 1994. The 16 mile project cost \$15.4

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