Experiences from the Northridge Earthquake: Applying HOV Treatments in an Emergency

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The Caltrans Response

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I would like to provide an overview of the Caltrans response to the Northridge earthquake. Although it was a major earthquake, the impact on the freeway system would not have been all that bad except for the fact that I-5, the major interstate route between Canada and Mexico, was severed at the interchange with State Route 14. This is a location where, because of the topography, there is no parallel arterial or freeway. Interstate 5 also is a major north/south truck and car corridor in this region. The severing of this route caused trucks to be rerouted throughout the Southern California area and resulted in major problems for commuters living in the area north of Los Angeles. At that location, I-5 carries approximately 130,000 vehicles a day. Trucks account for some 15 to 20 percent of this traffic. Other facilities that were affected include State Route 14 and State Route 118 which carry approximately 180,000 vehicles a day, respectively. Both of these routes are primarily commuter freeways. On the other hand, the Santa Monica Freeway (I-10) carries some 340,000 to 370,000 vehicles a day depending upon the location. It is located in the heart of the west side of downtown Los Angeles, and there is a substantial grid network of alternate routes in the Santa Monica Freeway Corridor primarily high standard arterials and some parallel freeways which are not present in the I-5 Corridor.

The I-5 Freeway was also severed at Gavin Canyon just north of SR 14. Major sections of State Route 118 immediately east of I-405 were also severely damaged. Also the eastbound roadway suffered major damage and collapsed on a viaduct section; the westbound roadway was temporarily shored, resurfaced and reopened in a relatively short time to carry both east and west traffic.

One of the innovations on I-10 was the utilization of an eastbound off-ramp which was quickly repaired and opened in the opposite direction for utilization by westbound HOVs. Two alternate routes were provided where I-10 was severed at La Brea Avenue.

The utilization of truck route/bypass lanes at the I-5 and State Route 14 interchange area provided two lanes in each direction almost immediately for traffic detoured by way of State Route 14. With a little creativity, the northbound direction was expanded to include an HOV lane and two general purpose lanes. Southbound State Route 14 was restriped to provide one HOV lane (and two SOV lanes) which provided a quick bypass so that traffic could more efficiently utilize the southbound truck lanes which remained opened. In addition, a superseded parallel state highway known as Sierra Highway, which was essentially a four lane facility, remained open to traffic. Traffic flow was modified to provide initially three lanes in the peak direction and one lane in the opposite direction. However, as soon as the truck bypass lanes were opened, Sierra Highway was permanently converted to three southbound lanes and one northbound lane thus balancing total capacity. The key here was the ability to convert to HOV operations an HOV lane in each direction on the truck bypass. In the northbound direction, a three mile HOV lane was created, and in the southbound direction, a 10-mile HOV lane was created. These lanes were extremely effective, providing about a 15 to 20 minute savings in travel time to HOVs. All of these changes were accomplished through the coordinated efforts of Caltrans, City and County of Los Angeles and the city of Santa Clarita.

On I-5, a two-lane detour was created which utilized the superseded state highway arterial (known as the Old Road) which provided for two lanes of traffic in each direction as compared to the eight lane I-5 freeway. No HOV lanes were in use on this bypass.

HOV lanes were used on State Route 118 because restoration of original capacity was able to be provided in less than a month and a parallel arterial system existed. This section of State Route 118 was essentially a six-lane facility. By restriping and reshoring the westbound viaduct, six lanes of traffic (three lanes in each direction) were provided, essentially restoring the original capacity, while the eastbound viaduct was being rebuilt.

Two detours were established on the Santa Monica Freeway between Washington Boulevard and La Brea Avenue. An HOV detour utilized the Santa Monica Freeway right up to the location of the structure collapse. Westbound HOVs utilized a converted eastbound offramp/ connector and were essentially taken off the freeway at one offramp and immediately back on the converted eastbound offramp. Eastbound HOVs were taken off at La Brea Avenue and returned at Washington Boulevard. A more circuitous detour was necessary for SOVs that were diverted off the freeway at La Brea Avenue approximately one mile upstream of the HOV lane determination. Eastbound HOVs were also exited at Robertson where they traversed local arterials leading to the freeway at Washington Boulevard. Overall, there was a savings of approximately 15 to 20 minutes for HOVs during the peak commute period.

The public adapted well to the installation of HOV lanes, both on I-10 and I-5/SR 14 truck lanes. On the SR 14 truck lanes, peak HOV volume frequently ranged from 2,000 to 2,200 vehicles per hour per lane during peak periods. On I-10, HOV usage ranged from 700 vehicles per hour to 1,400 vehicles per hour during peak periods. Mixed flow lanes on the State Route 14 truck bypass frequently ranged as high as 2,400 vehicles per hour per lane. The overall savings to the public utilizing HOV lanes averaged approximately 20 minutes.

The Los Angeles County Metropolitan Transportation Authority Response

Arthur T. Leahy, Los Angeles County Metropolitan Transportation Authority

The earthquake occurred at 4:31 A.M. on January 31, 1994. That was a holiday Monday morning. By 5:30 A.M., an emergency command center had been established at the LACMTA. Staff from all departments—including operations, equipment maintenance, facility maintenance, engineering, safety, communications, and the news bureau—gathered at the center to share information and to start identifying response strategies. The group examined the extent of damage to facilities and equipment, available communications, and alternatives.

A number of immediate actions were initiated. First, all bus and rail operators were mobilized. This effort followed the previously developed emergency plan, so LACMTA personnel knew what to do. An assessment of all facilities was initiated to determine the extent of damage and necessary repairs were identified. These efforts were coordinated with those of other agencies through the command center in the basement of City Hall.

Although the first day was very difficult with reoccurring aftershocks, 96 percent of the normal bus service was operated. Ridership was about 20 percent below normal, but it was important for transit dependent groups. Responses from riders indicated that the service was critical for traveling to and from work. This provided a reassurance to the public that the city was still functioning.

The Metro Blue Line was also in operation that day. The system was inspected after each aftershock to ensure that all the structures were still sound. The Red Line subway was not in operation, however, due to the inspections needed after each aftershock. A bus bridge was established replicating the route of the Red Line. On Tuesday, the day after the earthquake, all bus and rail service was in operation. Ongoing communications were maintained with Caltrans and local jurisdictions. This was critical since many of the bus route were impacted by detours and conditions on the freeways and local streets. Approximately 75 detours were in place within 24 hours of the earthquake.

During the weeks after the earthquake, the MTA actively participated in an interagency planning committee. This committee was chaired by a representative from the governor's office. A great deal of support was provided by the governor's office, as well as federal officials. Other representatives on the committee were from Caltrans, the City of Los Angeles, law enforcement agencies, and the other transit agencies in the area. The purpose of the committee was to plan and coordinate street and highway detours, bus service changes and new services, and coordinating public information. Daily updates and press releases were used to help communicate with residents and travelers.

In closing, the experience of the LACMTA indicates the importance of having an emergency plan that all employees are familiar with. It is also critical to update these plans after they are used in an emergency. The plan worked well and all employees knew what they should do. The single largest key to success was probably the close coordination and communication among the different