Major-Incident-Response Team Relieves Traffic Jams in Los Angeles

A traffic control major-incident-response (MIR) team formed in 1973 has been successful in reducing traffic jams in the Los Angeles, California, area and in increasing motorist safety on the city's 700 miles of freeways.

In a recent typical emergency, a brush fire in a hilly residential area brought traffic to a halt when flaming material fell on the roadway. Within minutes, a fast-moving MIR team of traffic controllers worked out several preplanned alternate routes, set up changeable message signals, and rerouted traffic through alternate roadways. In a matter of minutes, what could have been a disaster became a routine traffic delay.

Speedy response is the key to keeping traffic congestion to a minimum, says David H. Roper, Deputy District Director, California Department of Transportation (Caltrans). Roper, who is a member of TRB's Committee on Freeway Operations (A3A09), says that 1 min of delay in responding to a major traffic incident results in 4 min of congestion. So a 5-min response time means that traffic will be flowing freely again in 20 min, while a 15-min response time means that the freeway will be tied up for 1 h.

The MIR team consists of 19 members of the staff of Caltrans' Traffic Operations Center or Maintenance Communications Center in downtown Los Angeles. Team members work at the District 07 office during normal work hours. In off hours, the team members respond from their homes; they cover the three Counties of Ventura, Orange, and Los Angeles, with emphasis on the more heavily traveled freeway routes in and around Los Angeles.

Each team member is provided with a take-home sedan or pickup truck, equipped with multichannel radios, detour signs and stands, traffic cones, flashing lights, and first-aid equipment. In addition, pickup trucks carry panels and materials to make temporary display signs for traffic diversion.

A sign truck from Caltrans' MIR team alerts night-time motorists of an accident ahead on a Los Angeles freeway.

A changeable-message sign truck is stationed on the shoulder of the San Diego Freeway. Electronic signs are programmed with up to five words, and messages can be changed readily to keep motorists up to date on changing conditions.

Caltrans' Operation Center in Los Angeles features a map of the area's 700 miles of freeways. Green, yellow, and red lights indicate status of traffic flow on each segment.

A key to the success of the system has been the use of changeable-message-sign trucks. Electronic signs are mounted on pickup trucks and programmed with five-word, seven-character messages about weather conditions, lane closures, and length of traffic delays. Continuous-sequence messages are illuminated on a bulb-matrix panel with a high degree of visibility. The message panel is elevated 8 ft off the ground; it measures 8 ft x 2.5 ft. Messages can be reprogrammed as conditions change. Temporary fabric and metal sign panels are placed along the alternate routes to direct motorists.

"Major incidents" are defined as those that are expected to block two or more lanes of traffic for 2 or more hours. When such an incident occurs, the first person on the scene, usually an officer of the California Highway Patrol (CHiP), reports the location, analyzes the situation, and estimates the duration of the problem.

Based on this information and the nature of the incident, the MIR team leader selects the members of the team and responds to the call, monitoring the situation on the way by radio. On arrival at the scene, a command post is set up in the team leader's vehicle, where representatives of the various agencies involved can discuss appropriate actions to relieve the situation. Decisions involve maintenance, safety, and engineering; they can also involve CHiP, local police, and maintenance crews from Caltrans.

"Face-to-face discussion, involving those responsible for the multitude of actions that must take place, brings about a planned effort that best solves all problems while using joint authorities," says Senior Engineer Robert Zimowski, the District 07 engineer in charge of the MIR operation. "Cooperation and coordination are the key to success—and it works."

The success of the MIR program rests with immediate identification of alternate routes, which involves a great deal of preplanning. Says Zimowski, "As a first step in our planning phase, we physically inventoried all existing surface streets that might serve as alternate routes for every section of freeway in the Los Angeles area. Street

The MIR fleet consists of pickup trucks and sedans, a CHiP patrol car and helicopter, and an L.A. City Fire Department sedan. Close cooperation among all agencies involved is the focus of the MIR program's success.

widths, curvatures, grades, conditions of surfacing, intersections, side friction, and turning radii were all recorded. At the same time, we identified missing links that might be constructed to close gaps in desirable alternate routes. We could then select a best and second-best alternate route for each possible freeway closure."

Caltrans also gathered demand information for each freeway by breaking the 24-h day into various segments and by assigning a demand value to each time period, based on traffic flow. In their planning, Caltrans engineers took the position that they would use whatever capacity remained on the freeway (measured by the number of lanes remaining open) to the maximum extent possible. With information gathered during the preplanning stage, the MIR teams are able to assess the total capacity needed by implementing an alternate route.

In order to monitor all the interchanges on the freeway network, District 07 has developed 3000 maps of Los Angeles, Ventura, and Orange Counties, which show primary and secondary diversion routes, staff requirements and locations, required signing, closures, responsible individuals and telephone numbers, and any special notes unique to the incident area.

By using the appropriate map or maps as a guide, the MIR team places one or more changeable-message-sign trucks ahead of the diversion to alert oncoming motorists. Temporary signing is placed along the alternate route to direct motorists around the incident location and back to the freeway. Where necessary, traffic officers direct traffic off the freeway and through intersections. With traffic detoured around the incident, cleanup and maintenance operations can get under way.

Says Zimowski, "Side benefits have emerged from this alternate route program. The knowledge of available routes and contacts with people in the field have been put to use in planning detours necessary for construction and maintenance activities on the freeway. Many of the same procedures and techniques used in incident management apply to planned closures, and the public can realize similar savings in time, in increased safety, and in reduction of frustration."

Such planned closures include special events at the Los Angeles Coliseum, the Rose Bowl, Anaheim Stadium, and the Santa Anita Race Track. MIR teams were present at Edwards Air Force Base recently to handle the crowd of 200 000 people who witnessed the return of the space shuttle.

During the nine years that the MIR program has been in operation, the team has responded to more than 1600 major incidents. This has resulted in a cumulative delay savings of 400 000 vehicle-hours. "These delay savings are only part of the picture", says Roper. "The larger savings are accidents that did not happen, with an accompanying reduction in delay and the lessening of driver aggravation. A good example of this type of saving occurred in 1978, when in one day beach-bound traffic created a congestion problem that created six end-of-queue accidents. The MIR team was contacted to assist the following weekend in the area. Before arrival, one incident occurred. However, once the equipment and personnel were operational, no further incidents occurred. It is difficult to say that five accidents were prevented, but obviously accidents did not occur, congestion was lessened, and people got where they wanted to go without delay."

A Caltrans report on the program points out, "Preplanning for major freeway incidents by planning of alternate routes and providing for on-site management of incidents won't solve all of our congestion problems related to incidents. In many cases it will do little more than make the best of a bad situation. With relatively long-term incidents, it provides the starting point and allows us some time in which to make more extensive arrangements. It can bring some sense of order to what is often a chaotic situation. Providing the whole package, including preplanning, the command post with the atmosphere for overall incident management, the hardware, and the traffic expertise, represents a sound approach to solving an all-too-common problem."