Advance Planning for Emergency Handling of Highway Traffic

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Advance planning for emergency detours on a highway system benefits the user and the personnel establishing the detours. Development of such plans requires preparation of maps, determination of critical points, location of detours for short- and long-term closures, review and coordination with involved law enforcement agencies, planning of news releases, establishment of cross-communications systems, and testing and revision of detour plans. Two major incidents proved the value of advance planning. In the case of a large forest fire, the planned detour was used. In another case, the advance planning process aided in improvising a new detour plan under emergency conditions. This occurred when a munitions explosion precluded the use of the planned detour. The handling of these emergencies demonstrated that advance planning of detours is beneficial whether preplanned or field improvised.

Advance planning for handling highway traffic when emergency closures occur is essential to the orderly movement of traffic. Closures can be caused by natural disasters, spectacular accidents, civil disorders, and organized blockades. Adequate advance planning for detours around these closures minimizes their effect on highway traffic and reduces the normal congestion that develops at these incidents.

District 03 of the California Department of Transportation is headquartered in Marysville, about 40 miles north of Sacramento. It includes 11 counties and 29 incorporated cities and is responsible for more than 1,400 miles of state highways. The district is divided into eight maintenance territories, each under the supervision of a maintenance superintendent.

Certain steps were followed for development of an adequate emergency plan. The first step was the appointment of a coordinator for plan development. He was responsible for preparing emergency detour plans for the entire highway system in the district.

Maps of the area were prepared on a large scale for the urban areas and a smaller scale for the rural areas. Critical locations, i.e., structures over large rivers and waterways, complex interchanges in urban areas, freeway-to-freeway separations, mountain passes, and any location that if closed would necessitate lengthy out-of-direction travel or other problems for the highway user, were identified on these maps.

Through the experience of maintenance and traffic engineering personnel, detours were planned around these critical locations, both for short-duration detours (1 to 3 hours) and for extended closures (days, weeks, or longer). The time element has a

bearing on the complexity or simplicity of the detour route and the ease of following temporary signing. The longer the closure is, the greater the need is for an easier route to follow. Detours were also planned for short and long segments of freeways.

These plans were reviewed and discussed in detail with local law enforcement personnel (city police or California Highway Patrol) and, in certain situations, local fire department personnel. Input from these meetings is paramount to effective cooperation and coordination. Who does what? Who, in each organization, should be contacted? Who is responsible for providing the needed material and equipment? What types of signs are needed, and how many? Adequate intersection signing and "reassurance signing" (between intersections) are essential. Locations of storage areas for signs, barriers, barricades, and other materials to establish detours can be selected.

Planning news releases is beneficial. Keeping the public informed is essential to effective use of the detour. An informed public will know why the detour is necessary and how long it will last and, therefore, will be less likely to complain about inconveniences or out-of-direction travel. Bringing the district and state public information officers into the picture early relieves the operation personnel of the responsibility for keeping the media informed. News reporters clamor for up-to-date information; they do not like "old news."

Testing the effectiveness of advance planning occurs almost daily in urban areas where accidents or incidents, i.e., multiple-vehicle collisions, tanker-truck fires, overturned propane transporters, spilled cargo, and similar mishaps, usually require detours. Review of how the detour worked after each emergency provides for continuous upgrading of the total plan. The real test comes when nature washes out bridges and also closes secondary roads planned as detours or when a major explosion devastates a large area, including the highway and the planned detour.

The forest fire that closed US-50 is a good example of a test of advance planning for emergency closures. US-50 is mainly a two-way highway and is the direct route from Sacramento to South Lake Tahoe. It provides access to mountain recreation areas and the gambling casinos of Nevada. On August 18, 1973, the California Highway Patrol reported that a forest fire in the Kyburz area, east of Placerville, was out of control and that it might be necessary to close US-50. About 1 hour later, the highway was closed. The 1-hour delay gave the maintenance superintendent of Placerville the opportunity to contact the U.S. Forest Service Fire Control Center and establish communications for support of the closure and frequent updating on the status of the fire. The superintendent alerted maintenance crews of the need for equipment and materials to establish screening points and traffic diversions to selected detours. The transportation district office was notified, and the public information officer was alerted to the situation and the need for dissemination of current information to the news media.

Temporary signs were prepared for the diversion and closure points. Figure 1 shows the general area and the affected routes and the location of the fire.

At Placerville, eastbound traffic was diverted over Calif-49, either north to Interstate 80 at Auburn or south to Calif-88 at Jackson. Signs were placed in eye-catching locations preceding the diversion point to supplement the primary diversion point signing. At South Lake Tahoe, signs directed westbound traffic to Calif-88 and I-80 via Calif-89. Calif-89, -88, and -49 are two-lane highways in foothills or mountain regions, and the geometrics were not of a standard to handle the high-volume traffic that normally occurs on US-50. Allowing through traffic a choice of routes to circumvent the fire area tended to split the volumes into more acceptable numbers.

Next, closure and screening points were set up between the fire area and the diversion points (Fig. 1). These were required to handle local traffic to the small communities between Placerville and South Lake Tahoe. Manning of the points was jointly handled by California Highway Patrol and Department of Transportation maintenance men. Also, effective screening prohibited sightseers from filtering into the fire area and adding to the congestion of men and equipment assembled to fight the fire.

Information received from the screening and diversion points soon indicated that

initial signing needed to be supplemented by extra signs between Sacramento and Placerville and in the South Lake Tahoe area east of the point of diversion. This additional signing provided advance notice and gave the motorist more time to decide which route he wanted to use.

This detour plan remained in effect for 9 days, including 2 weekends, which gave us time to observe the operation under both weekday and weekend use. Minor modifications of the detour plan were made for future closures. Throughout the duration, communications with California Highway Patrol and the U.S. Forest Service personnel were maintained by twice daily meetings. In addition to keeping our operational crews informed, it also provided up-to-date information to the media through our public information officer.

Another major test of our planning occurred on April 28, 1973. On that date a munitions-laden freight train caught fire and exploded in the switching yards at Roseville, approximately 20 miles northeast of Sacramento. The yard is located adjacent to I-80, one of the state's primary east-west routes between the San Francisco Bay area and Reno, Nevada. This multilane freeway normally handles an average daily traffic of 45,000 vehicles. Figure 2 shows a map of the general Roseville area.

April 28 was not a normal day. It was a springlike Saturday and the opening day of trout season, and the weekend traffic developed earlier and in larger numbers than usual. A majority of state maintenance men took advantage of their weekend off and the beginning of fishing season and were part of the general exodus to the high country. This contributed to a shortage of available manpower.

Tremendous explosions ripped through the railyard situated less than ¼ mile north of I-80. The first blast occurred at approximately 8:28 a.m., and the resultant detonation and debris from it and subsequent explosions forced the immediate and complete closure of I-80 and many other local streets and highways.

Previously adopted emergency plans and use of prearranged detour roads and traffic shifts were, of necessity, superseded by on-the-spot decisions regarding affected areas and the question of future major explosions of train cargo. Because of the many uncertainties, local residents were evacuated from ever-widening areas. This decision was responsible for establishing flexible traffic controls and communications able to meet the maximum safety requirements of the roadway users. It also provided free unrestricted access and maneuverability for the various emergency forces and their equipment to enter the critical areas.

Soon after the first blast, a coordinated command post was established by the California Highway Patrol approximately 1 mile southwest of the explosion location. This center was used by all the forces cooperating in the emergency situation. Through use of this combined center, it was possible to coordinate all group activities and press releases on an informed and timely basis.

Word of the initial explosion and its potential effect on the state highway was received by department of transportation maintenance supervisors approximately ½ hour after its occurrence. Within another ½ hour, these field supervisors had established direct contact with the California Highway Patrol command post and had informed the district office in Marysville. The district office organized a communications center for the department of transportation, manned by staff personnel, and effectively coordinated activities within the three maintenance territories affected by the explosion. This involved locating manpower and shifting of equipment from various areas to fill the needs established by the field operations. The district center was also responsible for keeping the headquarters office informed and assisted with the dissemination of statewide press information.

Once the decision was reached to close I-80, maintenance crews and the highway patrol coordinated to establish the necessary diversion points and detour routes. Eastbound freeway traffic was diverted at an interchange located about 3 miles west of the explosion site. There, motorists were detoured over a multilane county road (roughly paralleling I-80, approximately 1 to 2 miles to its south) and were directed back to the freeway at an interchange about 2 miles east of the railyard. Shifting and handling of

Figure 1. Map of area affected by Kyburz fire.

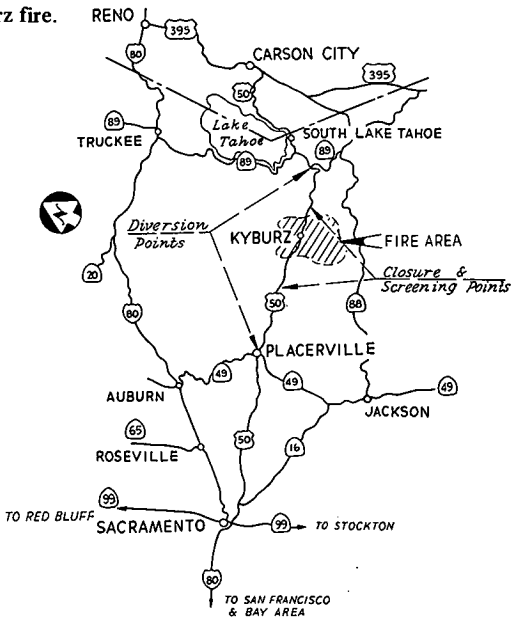
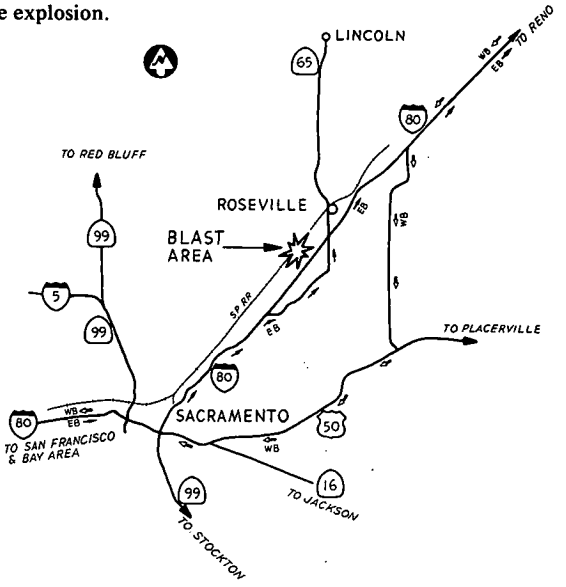


Figure 2. Map of area affected by Roseville explosion.



traffic were accomplished through a combination of control devices including barriers, state trucks with warning lights, temporary signing, law enforcement officers, department of transportation employees, and local volunteers. Basically this detour remained in effect all of the 28th and part of the 29th.

Coincident with the eastbound diversion was the initial rerouting of I-80 westbound traffic at an interchange just east of Roseville. The closure at this location was in effect for only a short while and then lifted, and traffic was able to use the freeway to the point where the detoured eastbound traffic was returning to I-80. Westbound motorists left the freeway and used the same county road that was handling the detouring eastbound traffic. Problems developed because of the numerous crossroad situations, local traffic conditions, and the over-capacity volumes using this county highway.

To alleviate the congestion and conflict between the overloaded, two-directional detour flow, we decided to completely separate the opposing traffic. Consequently a new diversion point was established about 5 miles east of the initial westbound closure location. There, interchange facilities were again used to direct these westbound motorists from the freeway onto a county road system. We used improvised signing and other traffic control devices, liberally supplemented by maintenance employee and law enforcement officer guidance, to direct motorists south over the county road, some 10 to 12 miles to US-50, a multilane freeway. On this major highway, the through motorist could then go directly west to Sacramento and points beyond. Local traffic had a choice of various street patterns leading to the perimeters of the closed section of I-80 and the adjacent restricted community areas.

The splitting of the detour traffic was paramount in alleviating what could have been a severe congestion and delay problem. Although westbound traffic was forced to use rural and somewhat substandard facilities (which at times carried over-capacity volumes), vehicle flow was smooth and there were no significant backups or snarls.

Did the advance planning pay off? Yes and no. Yes, the emergency detours used for the Kyburz fire were preplanned. They were basically the same used each winter when US-50 is occasionally closed by severe storms and heavy snowfall.

No, we did not follow the planned detour for the closure at Roseville because the explosion impacted a greater area than we had anticipated and closed our planned detour as well as the freeway. Yes, it did provide a communication system between law enforcement personnel and maintenance operations people. Yes, detour planning experience proved its value when the maintenance personnel, California Highway Patrol, and sheriff's office improvised other detours over secondary roads not affected by the explosions at the railyard. Despite the fact that the preplanned detour was not followed, the advance planning process did prepare the personnel involved to react swiftly and capably in an emergency. Their training resulted in efficiently establishing detours that satisfactorily carried high-volume Interstate highway traffic without major congestion or long delays. This is the proof that advance planning for emergency handling of highway traffic pays dividends.