

280

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BENEFITS OF ADVANCE PLANNING TO MEET TRANSPORTATION EMERGENCIES

modes

- 1 highway transportation
- 2 public transit
- 3 rail transportation
- 4 air transportation
- 5 other

subject areas

- 51 transportation safety
- 52 human factors
- 54 operations and traffic control
- 55 traffic flow, capacity, and measurements



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A report on Conference Session 82 of the 1983 Annual TRB Meeting, prepared by Samuel C. Tignor and Michael S. Della Rocca (Parson, Brinckerhoff, Quade and Douglas, Inc.). The session participants were J. J. O'Driscoll, Southern Railway Company, Lt. Henry C. Rockel, Maryland State Police; John C. Hess, Maryland Fire and Rescue Institute; David H. Roper, California Department of Transportation; John F. Temple, Florida Department of Transportation; Kay Colpitts, Montgomery County Department of Transportation, and Samuel C. Tignor, Federal Highway Administration.

BENEFITS OF ADVANCE PLANNING TO MEET TRANSPORTATION EMERGENCIES

The advance planning of an effective response to the various types of transportation emergencies that can occur is a challenging task. A substantial number of factors must be considered when advance planning is viewed in a generic sense. Among the most relevant are: modes of travel (auto, truck, rapid transit, rail freight, aircraft, waterways, buses, and pedestrians); location, time of day, and duration of the incident; size of the affected area and associated population; interagency coordination and response; and costs associated with advance planning, response, and restoration.

A highway incident is the most prevalent type of transportation emergency. In the United States, motorists suffer a loss of over 750 million vehicle-hours each year waiting for freeway incidents to be cleared. Nearly 400 million gallons of fuel are consumed during these delay periods. To the extent that advance planning can streamline the response to and mitigation of these and all other transportation emergencies, substantial benefits will accrue to direct and indirect users of transport facilities.

At the 1983 annual TRB meeting, the Committee on Travelers Services sponsored a conference session entitled "Benefits of Preplanning to Meeting Transportation Emergencies." A panel of seven speakers was assembled with a collective background in traffic operations and engineering, freeway incident management, crisis relocation planning, railway accident mitigation, law enforcement response, and fire and rescue response. Within the context of their area of expertise, each speaker discussed the benefits of advance planning to meet transportation emergencies, and generally presented a case study that demonstrated alternative approaches, concepts, and lessons learned.

This report summarizes the topics discussed at the conference session during the formal presentations and also in the subsequent question and answer period. Rather than simply provide a narrative explanation of each of the seven presentations, this report is organized according to common themes discussed by each speaker, including:

- o What are transportation emergencies?
- o What is advance planning?
- o Who should participate in advance planning for transportation emergencies?
- o What types of advance planning techniques result in effective responses?
- o What are the benefits to be derived from advance planning?

Each of these themes is discussed below.

What are Transportation Emergencies?

A general definition of a transportation emergency is an extraordinary event that causes congestion, delay, confusion, and/or general disruption of one or more modes of transportation. Such events may include spills, vehicle breakdowns, acts of nature, infrastructure defects, and accidents, among many others. An emergency may affect all modes of transportation - in fact, during the Air Florida crash of January 1982 in Washington, D.C., all modes but pipelines were impacted to some degree.

The types of transportation emergencies may vary considerably. Some are quite common - for example, about two million vehicular accidents occur on urban freeways each year. Depending on the nature and severity of the accident, impacts may be

quite localized, or may be spread over large geographic areas. Other transportation emergencies occur with far less regularity, such as the collapse of a highway bridge structure, but nonetheless cause significant problems for travelers and others in the vicinity.

Examples of transportation emergencies for modes other than the automobile include transit strikes, train derailments (passenger and freight), plane crashes and hijackings, and truck jackknifings. Emergencies for one mode of travel frequently impact directly on other modes. A disruption in commuter rail service may affect bus routes, pedestrian flows, and automobile traffic. In the extreme, transportation emergencies may result in long-term disruption of service, displacement of people from their residences, and loss of life.

What is Advance Planning?

Transportation emergency advance planning goes by many names. In the highway area, some of the forerunners have been known under the banners of freeway incident management, freeway surveillance and control, route diversion systems, and REACT teams. Some municipalities have written and tested emergency evacuation plans to respond to incidents such as chlorine tank car derailments and hurricanes.

With regard to transportation emergencies, advance planning addresses the question of what if. After an emergency has already happened, planning generally occurs prior to the implementation of an appropriate response. However, advance planning differs from normal planning in that it attempts to identify the likelihood of an incident occurring, the anticipated impacts of the emergency, and procedures to mitigate these impacts and return the affected environment to a state of normalcy.

Some types of transportation emergencies lend themselves to advance planning more than others. For example, it is practically impossible to predict where or when an airplane crash is likely to occur, and advance planning can only be done in a general sense. However, for specific highway facilities that repeatedly experience incidents in the same general location (such as a long narrow bridge), advance planning is somewhat easier to accomplish.

Factors influencing the extent to which advance planning can be effectively done are the probability of an emergency; its location, time of day, and duration; and the severity of the incident. The impact of a transportation emergency, weighted by the likelihood of its occurrence, generally determines if the costs associated with advance planning a response are worthwhile.

Who Should Participate in Advance Planning for Transportation Emergencies?

A common sentiment among the speakers at the conference session was that, to a large extent, the responsibility to plan in advance falls within the political base of the community. Disaster advance planning in general, and particularly with respect to transportation, is within the purview of local, state, and federal government. These entities must establish a legislative mandate for command and control during an emergency so that advance planning can occur in a productive manner. This does not necessarily mean that government agencies are in control at the actual time of an incident.

For example, railroads generally are responsible for protective measures along their right-of-way during train derailments. However, effective advance planning best occurs when a single agency serves as a focal point, and government organizations are best suited to that task when large portions of the general public are likely to be affected.

Several examples will serve to demonstrate who is typically involved in advance planning for transportation emergencies. In the state of Florida, the Howard Frankland Bridge is a 3-mile long structure that is part of the heavily traveled Interstate 275 linking Tampa and St. Petersburg. In the mid-seventies, a multiagency, multidisciplinary incident management team was organized to analyze the operational problems existing on the bridge and to identify low-cost alternatives that might prove beneficial. Traffic engineers from the city governments of Tampa and St. Petersburg, and from their respective county governments, served with state traffic engineers on the team. Law enforcement was represented by Florida Highway Patrol officers, who were primarily responsible for bridge surveillance, and by members of the counties' sheriff offices and Tampa Police Department. Also participating were fire department officials from the two counties and other officials involved with the dispatching of ambulance services. Finally, to round out the team, officials of the American Automobile Association participated.

In March of 1979, the states of Maryland and Virginia were involved in responding to a transportation emergency when a structural defect was found during a routine, annual inspection of the Governor Harry W. Nice Memorial Bridge. An important element in the successful response to this incident was the involvement of the print, television, and radio media. Advance planning had already resulted in the preparation of a roster of radio and television stations to be contacted, as well as area newspapers. An expeditious notification of the public resulted from this preparation, indicating the value of including the media in advance planning efforts.

A third example of who should participate in advance planning is provided by analyzing the Southern Railway Company's past efforts. In this instance, a private entity took the lead and assisted local government in advance planning for hazardous materials accidents along its rail freight lines. Southern Railway went to nearly 1500 fire services companies to explain probabilities and risk, train individuals, and develop a written guide kept at fire stations.

What Types of Advance Planning Techniques Result in Effective Responses?

Techniques that facilitate an effective response to transportation emergencies are generally related to the type of incident expected to occur. Many implementation procedures for a hurricane evacuation are not necessarily appropriate to a transit strike, for example. However, certain procedures are common to most advance planning efforts.

All panelists present at the conference session agreed that advance planning must identify lines of authority and communications channels. If a transportation emergency has been detected or is expected to occur, the appropriate team(s) must have a clear understanding of their roles and responsibilities if the response is to be effective. These predesignated assignments may be a

matter of law or simply an understanding based on past performance, but are essential to a successful operation. This is particularly true when information is disseminated to the public; conflicting instructions from multiple sources are quite detrimental, thereby prohibiting an efficient response.

Many transportation emergencies are responded to utilizing a command post or operations center concept. Key members of the response team are organized at a central location to facilitate interagency communication and coordination. For example, the California Department of Transportation freeway incident management program uses command centers to collectively identify specific implementation plans (i.e., alternate routes); decide when changes are needed; identify manpower and equipment needs and make assignments; and determine how and when to end control. Incident Response Teams, consisting of approximately 20 volunteers and 10 vehicles from different agencies, are given instructions and are monitored from the command center.

Practice makes perfect is an adage that certainly applies to advance planning for transportation emergencies. Disaster response exercises are a key component of advance planning. They identify potential communications and response problems likely to occur during an actual incident, encourage cooperation among agencies prior to the need for a response, and involve and train actual personnel likely to participate during an emergency. Drills and exercises may be conducted within a particular organization, or among some or all of the involved entities. In some instances, such as exercises for nuclear power plant evacuations, the transportation response is tested to the point of deploying buses to run test routes. Of course, for incidents that occur on a regular basis, each actual response serves as an exercise or test for the next occurrence.

What are the Benefits to be Derived from Advance Planning?

Advance planning responses to meet transportation emergencies provides many tangible benefits, to both direct and indirect users of the affected facility, and also to the agencies participating in the response. Among the benefits attributable to advance planning are:

- o reduced delays to travelers,
- o faster medical attention,
- o shorter disruption in area transportation,
- o energy savings, and
- o improved coordination among involved agencies and the private sector.

This latter benefit of advance planning - improved coordination - is the least quantifiable, but perhaps the most substantial of the benefits provided. At the Maryland State Police, advance planning has assured that the basic framework exists for the required coordination among the various agencies involved in a given response. This process has also assured that the essential communication links are known to emergency response personnel. In addition, the cooperative effort established in advance planning for a particular type of emergency generally is maintained when a different, and perhaps larger, problem is encountered.

At the Florida Department of Transportation, a similar team effort was used to prepare a response plan for traffic incidents on the Howard Frankland Bridge. The incident management team meetings

proved to be a valuable forum in which the perceptions and ideas developed in one agency could be shared and discussed among other agencies who perhaps, because of their level and manner of involvement, had different perceptions of the problems, and their potential solutions. Because of this constructive interaction, team members grew to better understand the true nature and scope of the problems and why some previous band-aid remedies had been ineffective.

It is possible to quantify benefits that accrue from advance planning. Los Angeles has been developing methods to reduce incident delay on their 650-mile freeway system for about 10 years.

The California Department of Transportation currently responds to 10 or more major incidents per month. Their advance planning efforts have resulted in effective response procedures that have reduced average monthly delay by 15%.

Transportation emergencies certainly will continue to occur as time moves on. However, as discussed at this conference session, advance planning can effectively mitigate many of the negative impacts attributable to these emergencies. The Travelers Services Committee will continue to act as a forum for any individual or agency with an interest in ways to effectively plan responses to transportation emergencies.