

Task Two Literature Search for Federal Highway Administration (ITS-JPO)

Assessment of State of the Practice and State of the Art in Evacuation Transportation Management

Contract Number DTFH61-01-00183



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16. Abstract Much of what is known about evacuations is based on preparations for incidents, such as hurricanes, for which there is advance warning. With advance warning, evacuations can be planned and managed using procedures and systems that have been developed as a result of extensive and methodical pre-planning. This approach, however, does not adequately support management of incidents when there is no advance warning or when conditions are changing rapidly. Evacuations in response to these types of incidents tend to be monitored, but not well managed. The Federal Highway Administration (FHWA) recognized the importance of and need for new tools and processes to help agencies plan for and manage evacuations where there is little or no advanced warning. Consequently, the FHWA initiated a project to assess the state of the practice and state of the art in evacuation transportation management. This report was prepared to document a literature search to assess what is currently known about the management of evacuations and transportation management during evacuation situations, including the necessary support from public safety and other public organizations with a role in managing evacuations.					
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1 Executive Summary

Much of what is known about evacuations is based on preparations for incidents, such as hurricanes, for which there is advance warning. With advance warning, evacuations can be planned and managed using procedures and systems that have been developed as a result of extensive and methodical pre-planning. This approach, however, does not adequately support management of incidents when there is no advance warning or when conditions are changing rapidly. Evacuations in response to these types of incidents tend to be monitored, but not well managed.

Communities can plan for an incident and the associated evacuation; however, during no-notice evacuations, they generally have little time to assess the situation before starting the evacuation process. In a no-notice situation, the need to react is immediate—with little advance warning. The *American City and Country* article “Community Evacuation: Ensuring Safe Passage,” reported: “Some disasters come with notice, while others hit without warning. As a result, planners have to factor in lead times for communicating and implementing evacuations. For some planners, time is on their side. For example, in Grand Forks, emergency managers monitored the development of a major spring flood in 1997 by tracking winter snowfall and melting rates. ‘We geared up slowly and reported regularly to the public through the media,’ Bryon Sieber, Commander for Planning and Research at Grand Forks North Dakota Police Department, says. ‘The long lead time enabled us to plan a two-stage evacuation. The first stage was voluntary; second came an ordered evacuation.’”

No-notice evacuations result in the need to respond immediately. During the derailment of a train carrying chlorine gas in Graniteville, South Carolina, emergency officials had to respond quickly. As reported in the *ContraCostaTimes.com* article “Chlorine Spill Forces Evacuations,” “a rapid response by local emergency officials in the hours after two trains collided on Thursday morning helped evacuate hundreds of residents from a ‘hot zone’ of contamination around the still-volatile wreck. Officials continued to cordon off a mile radius around the now-deserted site, unable to staunch the flow of chlorine from one crushed rail car and worried about the possibility of leaks from two other cars loaded with toxic chemicals.”

The phrase “no-notice” evacuations at times may be misleading because some incidents can be anticipated although they may occur with no notice. For example, communities that are located in fire- and flood-prone areas should expect to see wildfires during any fire or flood season. Communities located next to main line railroad tracks that are used to transport hazardous materials might expect to see a hazardous waste or chemical spill. On the other hand, these communities would not expect to see acts of terrorism such as the 9/11 terrorist attacks on New York City and Washington, DC.

The Federal Highway Administration (FHWA) recognized the importance of and need for new tools and processes to help agencies plan for and manage evacuations where there is little or no advance warning. Consequently, the FHWA initiated a project to assess the state of the practice and state of the art in evacuation transportation management.

There are eight tasks for the FHWA Assessment of State of the Practice and State of the Art in Evacuation Transportation Management. Task 2 is a literature search, and this report is the second deliverable for the project.

This report is organized into the following sections:

1. Executive Summary
2. Introduction

3. Methodology for Literature Selection
4. Findings
5. Lessons Learned
6. Best Practices
7. Potential Tools.

The Booz Allen Hamilton (Booz Allen) team employed a three-step process to complete the literature review and research: (1) collection of relevant domestic and international evacuation reference materials, plans, policies, procedures, newspaper and magazine articles, journals, industry publications, and other documents; (2) review and analysis of the documents; and (3) compilation of the results of the analysis for presentation to the FHWA in a final report.

The first task of the literature search was to identify anecdotal information and documented assessments of evacuation experiences; lessons learned; and any guidance for transportation, public safety, and emergency management agencies that may have been developed for evacuation events. As a result, the team identified several documents that relate to no-notice evacuations regarding incidents such as the 9/11 terrorist attacks in New York City and Washington, DC; the blackouts of New York City and Detroit, Michigan; the firestorms of British Columbia, Canada; the southern California wildfires; the Northridge earthquake; the I-95 tanker explosion; and the Howard Street rail tunnel fire in Baltimore, Maryland. Although the focus of these documents was not necessarily on evacuations, they were included because information can be gleaned from them that is applicable to evacuation events. The team also identified and included relevant information from any type of evacuation experience.

From these reports and numerous other articles and publications, this literature search assessed what is currently known about the management of evacuations and transportation management during evacuation situations, including the necessary support from public safety and other public organizations with a role in managing evacuations.

1.1 Key Issues and Findings

The Booz Allen team identified the following key issues for developing and implementing transportation evacuation plans:

- Nature of the hazard
- Transportation objectives
- Infrastructure
- Coordination
- Communication
- Special needs
- Changing conditions
- Impacts to transportation systems.

Table 1-1 summarizes the finding for each key issue.

