

# 1 Executive Summary

The goal of this project, *Application of Technology to Transportation Operations in Biohazard Situations*, was to develop a more comprehensive and actionable understanding of the role of transportation agencies during a biohazard situation. The documents and tools produced during this project are intended to help state and local transportation agencies perform the roles expected of them during all phases of a biohazard incident. Those roles can differ significantly from the ones they typically perform during other types of emergencies.

As described in the Background and Purpose section of this report, this project had six components:

- Task 2, *Literature Review*, May 17, 2005.
- Task 3, *Workshop Summary*, August 3, 2005.
- Task 4, *Transportation Biohazard Operational Concept*, August 31, 2005.
- Task 5, *Transportation Activities & Applications of Technology*, November 22, 2005.
- Task 6, *Transportation Operations during Biohazard Events Learning Tool*, December 2, 2005.
- Task 7, *Final Report*, December 2, 2005.

Findings from each product are summarized below. The full versions of these products appear in later sections of this report.

## 1.1 Literature Review

The *Literature Review* provides background information on biohazard agents and incidents; the vulnerability of different transportation modes to biohazards; existing programs, plans, and guidance related to biohazards; and existing emergency response models and tools that are applicable to biohazard situations.

Important findings of the *Literature Review* include the following:

- Biohazards differ greatly in their environmental persistence, contagiousness, and incubation period. These differences have significant implications for the role of transportation agencies in responding to a biohazard event.
- The response to a biohazard release will differ significantly depending on when the release is discovered. The response to a release that is promptly detected will be very different from the response to a biohazard release that is identified only after people become symptomatic (possibly weeks after the release).

## 1.2 Workshop

Representatives of the Wisconsin Department of Transportation, other federal, state, and local agencies, and transportation researchers participated in a scenario-based biohazards workshop on July 18, 2005. Participants discussed the transportation-related needs of public health, law enforcement, and other responding agencies under three different biohazard scenarios. Workshop participants assessed whether transportation agencies were prepared to fill those needs. Some common themes that emerged from these discussions include the following:

- Local, regional, and state planning and decision-making processes should include transportation agencies so that they can provide advice and recommendations regarding the transportation-related aspects of the response to a biohazard incident.
- Transportation agencies need to more fully develop agreements and protocols for working with law enforcement to enforce travel restrictions, curfews, and quarantines, and to support voluntary travel restrictions or “snow day” conditions.
- Transportation agencies that use the services of private contractors need to consider addressing the use of the contractors’ assets during a biohazard incident or other emergency in the service agreements with those contractors.
- Emergency management personnel may not be aware of all of the available transportation resources for communicating with the public.
- ITS technologies could improve the performance of transportation agencies during a biohazard event, but those technologies are not currently available in all areas.

### **1.3 Operational Concept**

The *Operational Concept* describes the emergency management framework and how transportation agencies fit into that framework. It also outlines the activities that a transportation agency could be asked to perform during all phases of a biohazard event. In particular, the *Operational Concept* identifies the following types of public health response activities that are likely to require support from transportation agencies:

- Distribution of mass prophylaxis,
- Control of the affected area and population,
- Care of casualties,
- Emergency management operations, and
- Resource and logistics support.

This document can serve as a guide and template for state and local transportation agencies as they prepare their own operational concept for biohazard situations.

### **1.4 Technology Application Plan**

The *Technology Application Plan* assesses the activities identified by the *Operational Concept* and proposes communications and ITS technologies that can assist a transportation agency in carrying out those activities. The plan identifies five categories of ITS technologies that can enhance the capabilities of transportation agencies during a biohazard situation:

- Surveillance and detection (e.g., closed-circuit television cameras, roadway detectors);
- Communications (e.g., mobile data terminals, computer-aided dispatch);
- Traveler information (e.g., variable message signs, Highway Advisory Radio);
- Environmental management (e.g., road weather information systems); and
- Traffic management (e.g., alternate signal control, signal preemption technology).

## 1.5 *Learning Tool*

The *Learning Tool* synthesizes the information and findings from the previous tasks and presents them in an engaging format suitable for distribution via CD-ROM or the FHWA website. This tool provides a way for transportation professionals to learn about biohazards and the steps transportation agencies can take to prevent, prepare for, respond to, and recover from biohazard incidents.

## 1.6 *Final Report*

In addition to the documents and tool described above, this *Final Report* includes a set of recommended practices for state and local transportation agencies, recommendations to FHWA on how to assist state and local transportation agencies, and areas for additional research. The recommended practices for transportation agencies are organized by phases of the emergency management process.

Key recommendations for state and local transportation agencies include:

- Transportation agencies and other providers of transportation services should increase employee awareness of biological threats and train them on the appropriate actions to take in the event of suspicious conditions, packages, or behavior in transportation facilities.
- Transportation agencies should identify how their existing ITS and communications technologies can be used in response to a biohazard incident, and should also identify critical needs for additional capabilities.
- Protocols and procedures to restrict mobility in areas that may be contaminated due to a biohazard incident should be developed and disseminated to transportation and emergency response officials.
- Adequate communications links should be created among transportation agencies at all levels (e.g., state, regional, and local) to handle needs that may arise in a biohazard situation.
- Contingency plans should be developed in case contaminated transportation facilities (e.g., traffic management centers, transit stations, and air cargo facilities) are closed for a long period of time.

Key recommendations for FHWA to assist state and local transportation agencies include:

- Disseminate this report and the *Learning Tool* developed under this project.
- Provide assistance in developing operational concepts.
- Coordinate and promote emergency response exercises that include biohazard scenarios and test the interoperability of ITS and other communications systems.

Key areas of additional research needs include:

- How transportation agencies have responded to actual biohazard events and training exercises, including the role that ITS played.
- The optimal implementation and use of key ITS technologies, including:

- Vehicle-based data acquisition (vehicle probes),
  - Real-time biohazard detectors,
  - Remote data collection, and
  - Digital technologies for geospatial, spatial, and temporal imaging.
- Development and testing of system interoperability, including functional requirements and standards for system.