

CHAPTER 6

6.9 TRANSPORTATION SYSTEM SECURITY

6.9.1. OVERVIEW

“The Federal Highway Administration and many other groups have been looking closely at homeland security and institutional strategies for providing metropolitan-level coordination of transportation system operations. A comprehensive national approach to incident management, applicable at all jurisdictional levels and across functional disciplines, would further improve the effectiveness of emergency response providers and incident management organizations, across a full spectrum of potential incidents and hazard scenarios. Such an approach would also improve coordination and cooperation between public and private entities in a variety of domestic incident management activities. Eastgate continues to coordinate with the principal agencies leading the charge on Homeland Security and Transportation System Security Initiatives, the Mahoning and Trumbull Counties Emergency Management Agency (EMA) Communication Centers, and ODOT. Our two county EMAs are prepared for incidents such as: terrorism, floods, hazardous materials spills, urban and open wild fires, tornadoes, aircraft accidents, earthquakes, and nuclear accidents.”^a Our local security-focused agencies continue to create scenarios in an effort to ensure preparedness for emergency incidents, either human-made or natural, throughout Eastgate’s two-county area. It should be noted that for Eastgate’s ITS Architecture Update and Strategic Plan Document (April 2011), one of the project identified and added as a result of our needs assessment exercise, was to study and develop a plan to evacuate Mahoning and Trumbull Counties in case of an emergency affecting the region. In order for a transportation security system to efficiently meet the demands of the local population, all related organizations must work together to achieve that ultimate goal, and for this reason, Transportation System Security will remain a very prevalent topic.

Eastgate continues to facilitate activities with local EMA initiatives and ODOT. At the request of the EMA, Eastgate periodically updates and identifies areas of interest with respect to highway, bridge, water, and other institutions of regional significance. A more recent example is that the EMA updated their Emergency Response Plan to include the location of those individuals with special needs. Because of confidentiality related issues, the EMA sent out a letter of assistance to all Social Service and Community Assistance Agencies requesting their help in locating those with special needs, either medical or just the need for assistance in the event of a necessary evacuation. Eastgate continues to offer its assistance to the EMAs and ODOT as necessary. The following narrative provides an overview of Transportation System Security factors that Eastgate, as the MPO and facilitator, considers in concert with our lead EMAs and ODOT.

6.9.2. ABOUT TRANSPORTATION SYSTEM SECURITY

According to the Transportation Planning Capacity Building Program, Transportation System Security can be defined as, “the freedom of intentional harm and tampering that affects both motorized and non-motorized travelers, and may also include natural disasters.”^b Metropolitan Planning Organizations (MPOs) are in a beneficial position in that they are able to promote interagency coordination between various modes of transportation, security-focused groups, government agencies and other related groups. MPOs are encouraged to implement security issues into their transportation planning and programming activities. In coordination with state departments of transportation, they are also able to fund projects and support programs that enhance secure travel.

^a Eastgate Regional Council of Governments, “Gap Analysis”. 2007.

^b Transportation Planning Capacity Building Program: “The Transportation Planning Process: Key Issues”.

6.9.3. HISTORY OF TRANSPORTATION SYSTEM SECURITY

Due to events like the September 11 terrorist attack and Hurricane Katrina, the vulnerability of the transportation system, especially with relation to evacuations, is receiving increased attention. There are three federal bills that primarily helped build the foundation for, and expansion of, current transportation security considerations.

Intermodal Surface Transportation Efficiency Act (ISTEA), and the Transportation Equity Act for the 21st Century (TEA-21): On December 18, 1991, ISTEA was enacted. This law provided authorizations for highways, highway safety and mass transportation. ^c On June 9, 1998, TEA-21 was enacted. This law was a reauthorization of ISTEA and extended the majority of the programs originally set by ISTEA.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU): On August 10, 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was enacted as a reauthorization of TEA-21. This law, totaling \$244 billion, guaranteed funding for highway, highway safety and public transportation. This marks the largest surface transportation investment in United States' history. ^d

SAFETEA-LU officially expired on September 30, 2009. However, this federal bill has been operating via a series of short-term legislative extensions. These extensions provide funding solvency through the end of 2011. At this time, a multi-year reauthorization bill remains a priority. ^e

6.9.5. SECURITY ISSUES

- Human-Made

The National Cooperative Highway Research Program released a report titled, "Incorporating Security into the Transportation Planning Process." This document explained:

"Transportation assets may be:

1. Direct targets of terrorism and extreme violence
2. Indirect targets of such acts
3. Compromised with respect to incident response"

Surface transportation has and will continue to be a common target for terrorists worldwide. This is due to the fact that transportation infrastructure serves high concentrations of people, provides essential services to people and can be used as a delivery and escape means for terrorists. Other types of human attacks are shown in the United States Department of Transportation Vulnerability Assessment Scenario List in Table 6.9.1 on the following page.

- Direct Attacks

Transit facilities are common targets of direct attacks in that they host large numbers of people and can be used to transport terrorist-related means. Highways are generally safe in that operators are typically dispersed on roadways, causing damage potential to be somewhat limited. However, bridges and tunnels are particularly vulnerable because they represent chokepoints: offering high casualty and broad, lasting infrastructure damage potential.

^c National Transportation Library: "Intermodal Surface Transportation Efficiency Act of 1991: Summary".

^d Federal Highway Administration: "A Summary of Highway Provisions in SAFETEA-LU".

^e United States Chamber of Commerce: "Update SAFETA-LU Reauthorization".

Table 6.9.1 – Scenarios Considered in the U.S. DOT Vulnerability Assessment

Physical Attacks

<ul style="list-style-type: none"> • Car bomb at bridge approach • Series of small explosives on highway bridge • Single small explosive on highway bridge • Single small explosive in highway tunnel • Series of car bombs on adjacent bridges or tunnels • Bomb(s) detonated at pipeline compressor stations • Bomb detonated at pipeline storage facility • Bomb detonated on pipeline segment • Simultaneous attacks on ports • Terrorist bombing of waterfront pavilion • Container vessel fire at marine terminal • Ramming of railroad bridge by maritime vessel 	<ul style="list-style-type: none"> • Attack on passenger vessel in port • Shooting in rail station • Vehicle bomb adjacent to rail station • Bombing of airport transit station • Bombing of underwater transit tunnel • Bus bombing • Deliberate blocking of highway-rail grade crossing • Terrorist bombing of rail tunnel • Bomb detonated on train in rail station • Vandalism of track structure and signal system • Terrorist bombing of rail bridge • Explosives attack on multiple rail bridges • Explosive in cargo of passenger aircraft
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Biological Attacks

<ul style="list-style-type: none"> • Biological release in multiple subway stations • Anthrax release from freight ship 	<ul style="list-style-type: none"> • Anthrax release in transit station • Anthrax release on passenger train
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Chemical Attacks

<ul style="list-style-type: none"> • Sarin release in multiple subway stations 	<ul style="list-style-type: none"> • Physical attack on railcar carrying toxics
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Cyber and C3 Attacks

<ul style="list-style-type: none"> • Cyber attack on highway traffic control system • Cyber attack on pipeline control system • Attack on port power/telecommunications 	<ul style="list-style-type: none"> • Sabotage of train control system • Tampering with rail signals • Cyber attack on train control center
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Source: National Research Council, *Improving Surface Transportation Security, A Research and Development Strategy*, Washington D.C: National Academy Press, 1999.

• Indirect Attacks

Indirect attacks cause collateral damage particularly to transit infrastructure in metropolitan areas. They are more common than direct attacks and primarily affect freight and highway passenger infrastructure. An example would be how the September 11 terrorist attacks not only resulted in a significant loss of life, more than 3,000 people, but the attack also caused millions of dollars in transit and road damage, destroying tunnels, stations, vehicles and supporting infrastructure.

• Response Capabilities

When surface transportation modes are disrupted, it has a prominent affect on emergency response capabilities. Choke points are especially vulnerable, particularly when situated near a major metropolitan area

or over bodies of water. Fixed guideway systems are also vulnerable considering the difficulty of rerouting from their fixed path. Highway systems are extremely vulnerable considering how they can easily result in gridlock conditions. Gridlocks result in a potentially high-casualty target for terrorists as well as an extremely difficult area for emergency vehicles or evacuation means to navigate.^f

- Security Issues – Natural Disasters

Natural Disasters are emergency events caused by forces of the natural environment. They are not caused by humans, yet cause significant damage. According to the Federal Emergency Management Agency, there are three planning approaches that relate to emergency management planning.

- Scenario-Based Planning

This approach can be considered a “mock exercise.” It consists of creating a scenario for a threat or hazard. Then planners analyze the impact of the situation and determine the relevant course of action. Planners use this tactic to develop planning assumptions, particularly to provide relevant annexes to a basic plan.

- Function-Based Planning

This approach determines the basic functions that a community must perform during emergency events. This tactic determines the function that needs to be performed as well as identifying the government agencies or departments responsible for performing it.

- Capabilities-Based Planning

This approach determines a community’s ability to take a particular course of action. This tactic answers the question, “Do we have what we need to perform this function?” It is often considered a combination of scenario and function-based planning due to its “scenario-to-task-to-capability” focus.

It is very common to use a hybrid approach, combining all of the planning tactics. This approach converts requirements generated by a scenario into goals and objectives that drive the planning process. It results in a plan that clearly defines roles, relationships and responsibilities, as well as identifying the course of action that must be taken. FEMA strongly recommends the hybrid planning approach.^g

6.9.5. MOCK EXERCISES

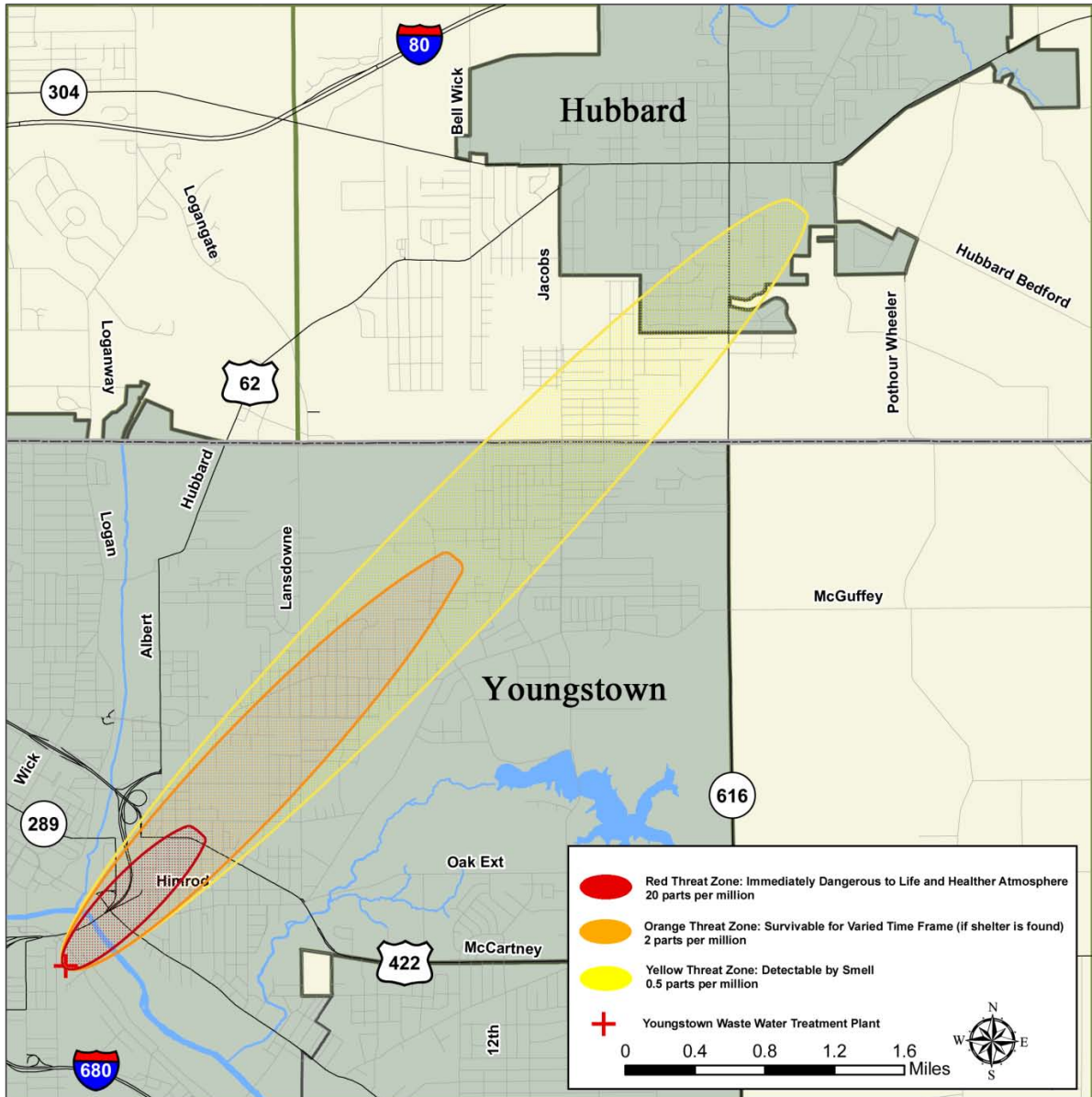
Over the years Eastgate has, and continues to participate in many of the local EMA’s “incident operation procedures”. These procedures act as a “mock exercise” and bring together various agencies that would be involved in an actual emergency.

One such example is when the Mahoning County Hazmat Team created a chlorine gas-leak scenario at the Youngstown Wastewater Treatment Plant. It was based on 2,000 pounds of chlorine gas being released within 10 minutes, with a wind speed of 3.35 mph heading North West. It was considered a low-risk scenario with high consequences. Based on the wind speed and direction and for potential evacuation purposes, Figure 6.9.1 represents a visual trajectory portrayal of what areas would be affected by the chlorine gas-leak.

^f National Cooperative Highway Research Program: “Incorporating Security into the Transportation Planning Process”.

^g FEMA, “Developing and Maintaining Emergency Operations Plans”.

Figure 6.9.1 – Mock Chlorine Gas-Leak Map



Source: Mahoning County Hazmat Team, “Mock Chlorine Gas-Leak Map”. 2010.

- Security Planning Process

There are five key areas that are vital to transportation system security planning. Integrating all areas allow communities to work with their local EMAs in an effort to produce the most effective emergency operations plan and to advance overall preparedness.

- Prevention

Prevention is a two-fold component. It typically consists of tactics that can reduce, or stop altogether the risk of a human-caused incident. It also helps to prevent, or lessen in severity, secondary incidents that may follow the primary incident. Prevention methods are also beneficial in that they help a community identify information requirements that support the overall planning process. Monitoring and surveillance technologies play a vital role in the prevention phase.

- Protection

Protection reduces or lessens a threat to people, property and the environment. The protection of key resources and critical infrastructure is extremely important to local communities, national security, economic vitality and public health and safety. It consists of actions to safeguard various entities from exposure, injury or destruction due to any form of threat- human-made or natural. These actions may occur prior to, during or following an incident and prevent, minimize or contain the overall impact.

Response:

Response is the collective term for actions taken in the immediate aftermath of an incident. These actions are primarily aimed at saving and sustaining lives, meeting basic needs, reducing loss of property and the effect on critical infrastructure and the environment. Response operations reduce the physical, social, psychological and economic effects of an emergency situation. Other important response actions are the efficient rerouting of emergency vehicles and ensuring communication systems are intact. Figure 2 on the following page represents an example of traffic being rerouted off of the Interstate 80 mainline in the vicinity of the Ohio and Pennsylvania state line, and was taken from ODOT District 4's Trumbull County Freeway Incident Management Report . This rendering identifies the following: County, Route, Reference Number, Direction, Incident Location by Route/Road, Interchange Number/State Line Mile (SLM) by State, Primary Routing, and Emergency Closure Telephone Numbers by agency. This particular representation was prepared in 2003; however District 4 has indicated that they intend to update this information in the near future.

- Recovery

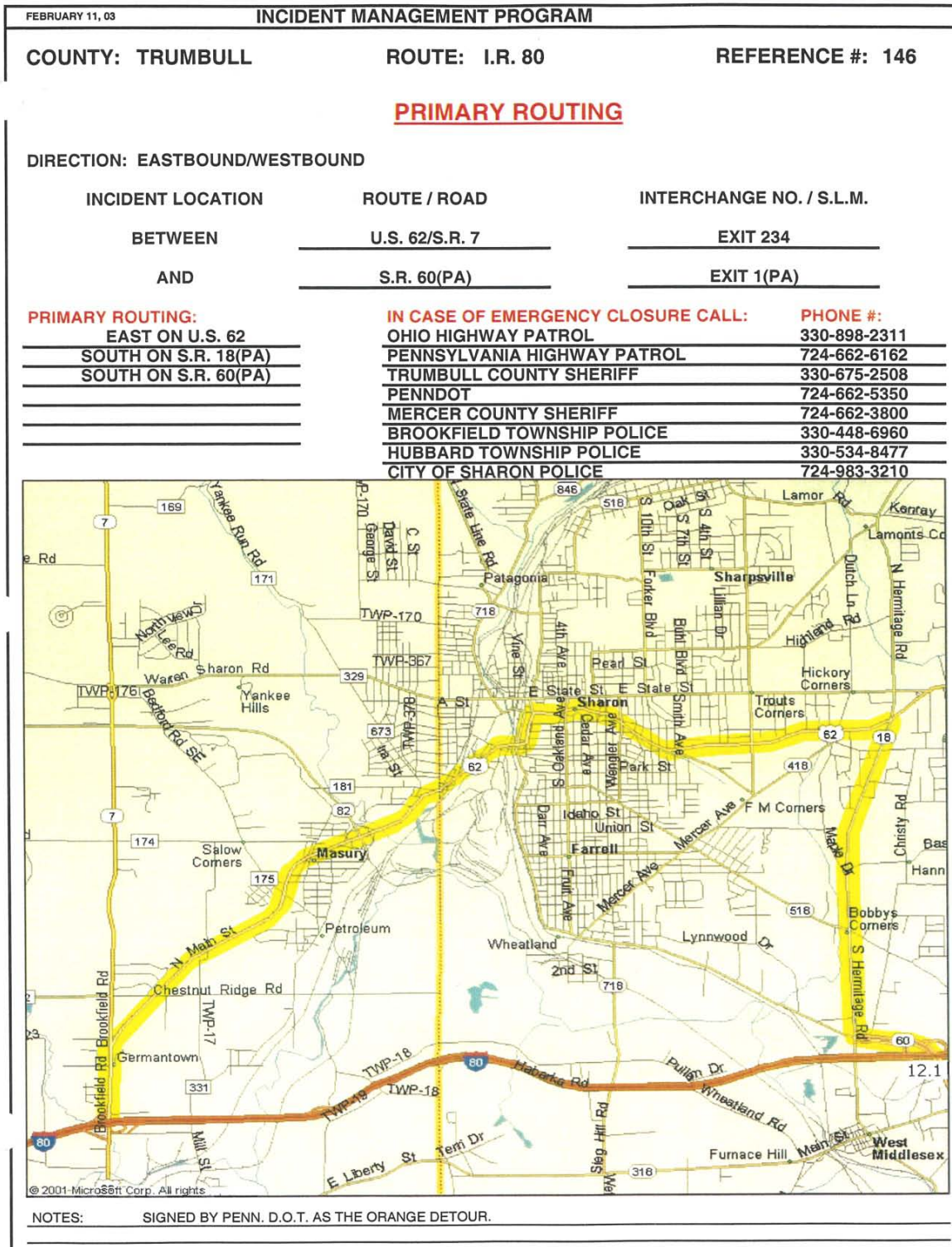
Recovery consists of short-term and long-term efforts to rebuild communities after an incident. When recovery planning, it is important to ensure that it is an easy transition from the response phase to the recovery phase. Short-term consists of reestablishing transportation routes and restoring interrupted services. Long-term consists of creating recovery plans that maximize results through the use of resources and incorporation of the national recovery doctrine.

- Mitigation

Mitigation focuses on the impact of a hazard. It involves structural and non-structural approaches with the intention of eliminating or lessening the presence of a hazard, people's exposure or interactions with people, property or the environment. It differs from other tactics in that it puts emphasis on the reduction of long-term risks through sustained actions.^h

^h FEMA, "Developing and Maintaining Emergency Operations Plans", Michael D. Meyer, Ph.D., P.E., "The Role of a Metropolitan Planning Organization in Preparing for Security Incidents and Transportation System Response.

Figure 6.9.2 – Interstate 80 Incident Routing



Source: Ohio Department of Transportation- District 4. "Trumbull County: Freeway Incident Management." (February 2003)

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