



# Project Summary

Texas Department of Transportation

## 0-5929: Managing the Movements of Hazardous Material Shipments Through Texas Population Centers

### *Background*

Vital aspects of everyday life depend heavily on products officially classified as hazardous materials. The term 'hazardous materials' generally refers to hazardous substances such as petroleum, natural gas, synthetic gas, acutely toxic chemicals, and other toxic chemicals. Their uses range from everyday household and personal uses to industrial production at various stages – for example, drinking water purification and automotive fuel.

Every day almost a million shipments of hazardous materials move safely and securely along our nation's transportation system, via any combination of modes. Only a small fraction of total shipments interrupt their planned journey due to an incident that may severely threaten public and environmental safety. However, this threat of very severe, sometimes even catastrophic, consequences – while rare – elevates the concern over transportation of hazardous materials through population centers. Furthermore, concern now exists over possible intentional hazmat releases as a means to invoke human, economic, and environmental damage.

It is vital for the transportation planning community at all levels to fully understand methods to effectively manage the movement of hazardous materials, thereby improving prevention and mitigation operations, increasing safety, and reducing risk without undue burden to commerce.

### *What the Researchers Did*

This research project accomplished the following activities:

- examined the quantities, origins, and destinations of hazardous materials flows in Texas by mode of transportation,
- reviewed the respective roles of stakeholders,
- investigated the hazmat route relocation potential of multimodal corridors and other rail routes, and
- provided guiding principles on effective state and sub-state strategies for the management of hazardous materials movements.

### *Research Performed by:*

Texas Transportation Institute (TTI),  
The Texas A&M University System

### **Research Supervisor:**

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**Project Completed:** 8-31-08

## What They Found

Flammable liquids such as crude oil, diesel fuel, and gasoline represent the largest hazardous materials class of products transported nationally and in Texas. Gases, such as chlorine used in drinking water purification, placed a distant second, while the remaining hazardous materials made up less than 10 percent of the total tons shipped.

In Texas, all modes are active in the transport of hazardous materials. Almost exclusively moving hazardous materials, pipelines stretch throughout the state and connect Texas to the rest of the nation and even Mexico and Canada. Following pipeline volumes, trucks play a major role in virtually every hazardous materials commodity. Additionally, rail and marine contribute significantly in the movement of hazardous materials, including such commodities as basic chemicals.

The research team determined several management strategies available to communities and planners. Generally these strategies fall within four categories:

- **Route and/or Operational Strategies** – such as designating hazardous materials routes,
- **Planning Strategies** – such as land use planning and corridor management and preservation,
- **Safety Strategies** – such as alternatives to hazardous materials, and
- **Infrastructure Strategies** – such as relocating rail operations to new infrastructure.

The conclusions for this research project include:

- The public is largely unaware of their coexistence with hazardous materials on a daily basis.
- Generally, hazmat will – and in most cases must – pass by and through communities to reach the ultimate consumer.
- Many actions to reduce the risk or improve safety exist or are possible in various ways, such as alternative processes or chemicals.
- Freight planning initiatives nationally and statewide are enhancing and will continue to enhance safe and efficient movement of hazardous materials.
- National and state hazard management activities provide a good framework for agencies to work together to reduce all hazard risks, including hazardous materials.

## What This Means

A guidebook of management strategies is being developed under this project. It will provide tools and activities that planners at all levels can utilize to reduce the potential negative effects of shipping hazardous materials through urban centers. Additionally, planners and officials will be able to utilize the data evaluation to better understand the overall movements of hazardous materials in Texas.

### *For More Information:*

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