Freight Transportation and Emergency Management: Profiles of Three Stakeholder Groups

Prepared for the
Intermodal Freight Transportation Institute (IFTI)
University of Memphis

Prepared by
Malcolm E. Baird, Ph.D., P.E.
Vanderbilt Center for Transportation Research (VECTOR)

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Preface

This paper was prepared for the Intermodal Freight Transportation Institute (ITFI) at the University of Memphis to help advance research, education, and outreach related to intermodal freight transportation. The primary audience for the paper includes IFTI faculty, staff, and students as well as representatives of the public and private organizations that support IFTI.

The paper is part of an ITFI initiative to improve mutual understanding between the public and private sectors relative to intermodal freight transportation. Many of the referenced documents are available online. Links are provided, and the links were current as of September 2009.

The report was funded in part by federal funds from the U.S. Department of Transportation (USDOT) and an unrestricted gift to Vanderbilt University from the Ingram Barge Company. A number of individuals provided invaluable information and insight for the report. Appreciation is expressed to the University of Memphis, the USDOT, and Ingram Barge and to the individuals who assisted in preparing and reviewing the paper.

The author is solely responsible for the content, findings, and conclusions.

Abstract

This paper offers profiles of three stakeholder groups with important interests in freight transportation and emergency management in the United States:

- Public agencies responsible for emergency management
- Public agencies responsible for transportation
- Freight transportation businesses

Each group is described in terms of mission, budgets, numbers of employees, stakeholders, institutional arrangements, and the respective forums for collaboration, research, and professional development. The components of the "national transportation system" are described as a preface to the sections on the transportation agencies and fright transportation businesses. Much of the information is elementary for individuals already familiar with one or more of these groups. The intent is to provide basic information and suggested sources for more in depth information to help each group better understand the perspectives of other groups who share important responsibilities.

Most of the paper describes the stakeholders separately; however, the paper is intended to encourage and facilitate more comparison, interaction, and advancement of mutual objectives.

Freight Transportation and Emergency Management: Profiles of Three Stakeholder Groups

The purpose of this paper is to provide a profile of three stakeholder groups with important interests in freight transportation and emergency management in the United States:

- Public agencies responsible for emergency management
- Public agencies responsible for transportation
- Freight transportation businesses

Much of the information presented may seem elementary to individuals already familiar with one or more of these groups. The intent is to provide basic information to help each group better understand the perspectives of the other groups who share important responsibilities for freight transportation and emergency management.

PUBLIC AGENCIES RESPONSIBLE FOR EMERGENCY MANAGEMENT

This group of stakeholders is comprised of the Federal Emergency Management Agency (FEMA), the state emergency management agencies, and local emergency management agencies that serve cities and counties throughout the U.S. These are the agencies with names ending with "emergency management agency"—the *Federal* Emergency Management Agency (FEMA), the (*Name of State*) Emergency Management Agency, and the (*Name of City or County or City/County*) Emergency Management Agency. However, the "EMAs" are not solely responsible for emergency management in the U.S. The roles of some of the organizations that share these responsibilities are also addressed in this section.

First, however, the use of the phrase "emergency management" may need some clarification. Most of the emergency management agencies at all levels of government work with "disasters" more than "emergencies," and most of their work involves "coordination" more than "management." They manage processes, communications, and emergency operations centers, and they administer grants; but arguably, their most important work is in coordinating the resources, plans, and priorities of other agencies.

Most emergencies in the U.S. are handled entirely by local public safety agencies, often referred to as "first responders"—law enforcement, fire and rescue services, emergency medical services, and emergency communications (911 and emergency dispatching). Specialized responders also assist the public safety agencies.

For highway emergencies many state DOTs and local governments operate "freeway service patrols" or "emergency response units." Private companies provide towing and recovery services

to clear the roadways. Hazardous material specialists respond when overturned vehicles and spilled cargo threaten public health, safety, and the environment.

Other modes of transportation also have internal resources for emergencies. Major airports have their own police officers and aircraft rescue and fire fighting (ARFF) resources. Major railroads also have their own police forces and other emergency response capabilities. The U.S. Coast Guard provides security and emergency response for deepwater ports. Businesses in transportation and other industries deal with a wide range of emergencies on their own properties using their own resources. A myriad of businesses offer consulting and restoration services.

Many different circumstances determine whether and when an emergency management agency (EMA) is involved in a particular event. EMAs often facilitate notification of affected parties even for relatively minor events. Many EMAs often have special responsibilities for events involving hazardous materials regardless of the scope. In general, however, EMAs are not directly involved in routine *emergencies* and are almost always involved in *disasters.* EMAs become essential when the public safety agencies and other responders need assistance that is not readily available. According to one educator and researcher:

> When a disaster occurs . . . police, fire, and emergency medical service (EMS) personnel cannot always cope with the resulting widespread impacts unless an emergency manager and numerous others are available to acquire resources for first responders and take care of broader response and recovery needs in the community (e. g., warning, sheltering, debris management, donations management, rebuilding, etc.). (McEntire 2007)

No standard definition has been adopted for "emergency management," but the following are representative. The first is from a textbook, *Introduction to Emergency Management:*

> Emergency management is an essential role of government. The Constitution tasks the states with responsibility for public health and safety—hence the responsibility for public risks—with the federal government in a secondary role. The federal role is to help when the state, local, or individual entity is overwhelmed. This fundamental philosophy continues to guide the governmental function of emergency management. (Haddow 2008)

Another introductory text, *Living with Hazards, Dealing with Disasters*, offers this:

> Emergency management is the management of risk so that societies can live with environmental and technical hazards and deal with the disasters they cause. (Waugh 2000)

In 2007, Dr. Wayne Blanchard of FEMA's Emergency Management Higher Education Project convened a working group of emergency management practitioners and academicians to consider principles of emergency management. The group agreed on eight principles, and the following is an excerpt from the introduction to those principles:

Definition: Emergency management is the managerial function charged with creating the framework within which communities reduce vulnerability to hazards and cope with disasters.

Vision: Emergency management seeks to promote safer, less vulnerable communities with the capacity to cope with hazards and disasters.

Mission: Emergency management protects communities by coordinating and integrating all activities necessary to build, sustain, and improve the capability to mitigate against, prepare for, respond to, and recover from threatened or actual natural disasters, acts of terrorism, or other man-made disasters. (IAEM 2007)

A list of the eight principles with explanatory information for each is available from the International Association of Emergency Managers. Link

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) was created in 1979 by an Executive Order from President Carter that merged programs and activities from a number of federal agencies that had responsibilities related to natural disasters and civil defense. FEMA absorbed responsibilities and resources from the Departments of Defense, Housing and Urban Development, and Commerce as well as the General Services Administration and other federal agencies.

FEMA remained an independent agency until an Executive Order from President Bush in 2003 created the Department of Homeland Security (DHS) and merged FEMA and a number of other already established agencies into the new department. More details about FEMA's status within DHS are discussed below, but first a cursory description is provided for the other components of DHS.

The DHS website includes the following statement of the department's mission:

> Our mission gives us five main areas of responsibility:
>
> 1. Guarding against Terrorism
> 2. Securing our Borders
> 3. Enforcing our Immigration Laws
> 4. Improving our Readiness for, Response to and Recovery from Disasters
> 5. Maturing and Unifying the Department (DHS 2009)

Figure 1 is an organizational chart for the Department of Homeland Security. In addition to more than a dozen staff and support offices (including the Federal Law Enforcement Training Center, the Domestic Nuclear Detection Office, and the National Cyber Security Center) the department

has seven line organizations with nationwide responsibilities for law enforcement, security, and emergency management:

- Transportation Security Administration (TSA)
- United States Customs and Border Protection (CBP)
- United States Citizenship and Immigration Services
- United States Immigration and Customs Enforcement (ICE)
- United States Coast Guard (USCG)
- Federal Emergency Management Agency (FEMA)
- United States Secret Service

Two of these organizations (TSA and the Coast Guard) were moved to the new Department of Homeland Security (DHS) from the Department of Transportation in 2003.

DHS now has more than 225,000 employees. FEMA accounts for only about 3,700 of the total (plus about 4,000 "standby disaster assistance employees"). The largest components of DHS in terms of numbers of employees are U.S. Customs and Border Protection (approximately 58,000 employees), the US Coast Guard (approximately 43,000 military and 7,300 civilian), the Transportation Security Administration (approximately 52,000), and Immigration and Customs Enforcement (approximately 20,000). (DHS 2009b)

Returning now to 1978 when FEMA was created:

> Most of FEMA's administrative apparatus came from combining the three largest disaster agencies: the Federal Preparedness Agency, Defense Civil Preparedness Agency, and Federal Disaster Assistance Administration. Thirteen separate hazard-relevant programs were moved to FEMA, including most of the programs and offices created in the 1970s. (Drabek 1991)
>
> These moves gave FEMA responsibility for nearly all federal emergency programs of any size, including civil defense, warning dissemination for severe weather threats, hazard insurance, fire prevention and control, dam safety coordination, emergency broadcast and warning system, earthquake hazard reduction, terrorism, and technological hazards planning and response. Where FEMA did not absorb a program in its entirety, interagency agreements were developed giving FEMA coordinating responsibility . . .
>
> Although FEMA remained the designated federal *lead agency* in most cases, there were 12 other independent agencies with disaster responsibilities. . . [and] because disaster related federal relief programs were so scattered through the government, many small programs remained in their home agencies. (Lindell 2006)

(After 1978, significant additions to FEMA's responsibilities occurred as a result of the Superfund Amendments and Reauthorization Act (SARA Title III) in 1986, the Robert Stafford Disaster Relief and Emergency Assistance Act of 1988, and other federal legislation.)

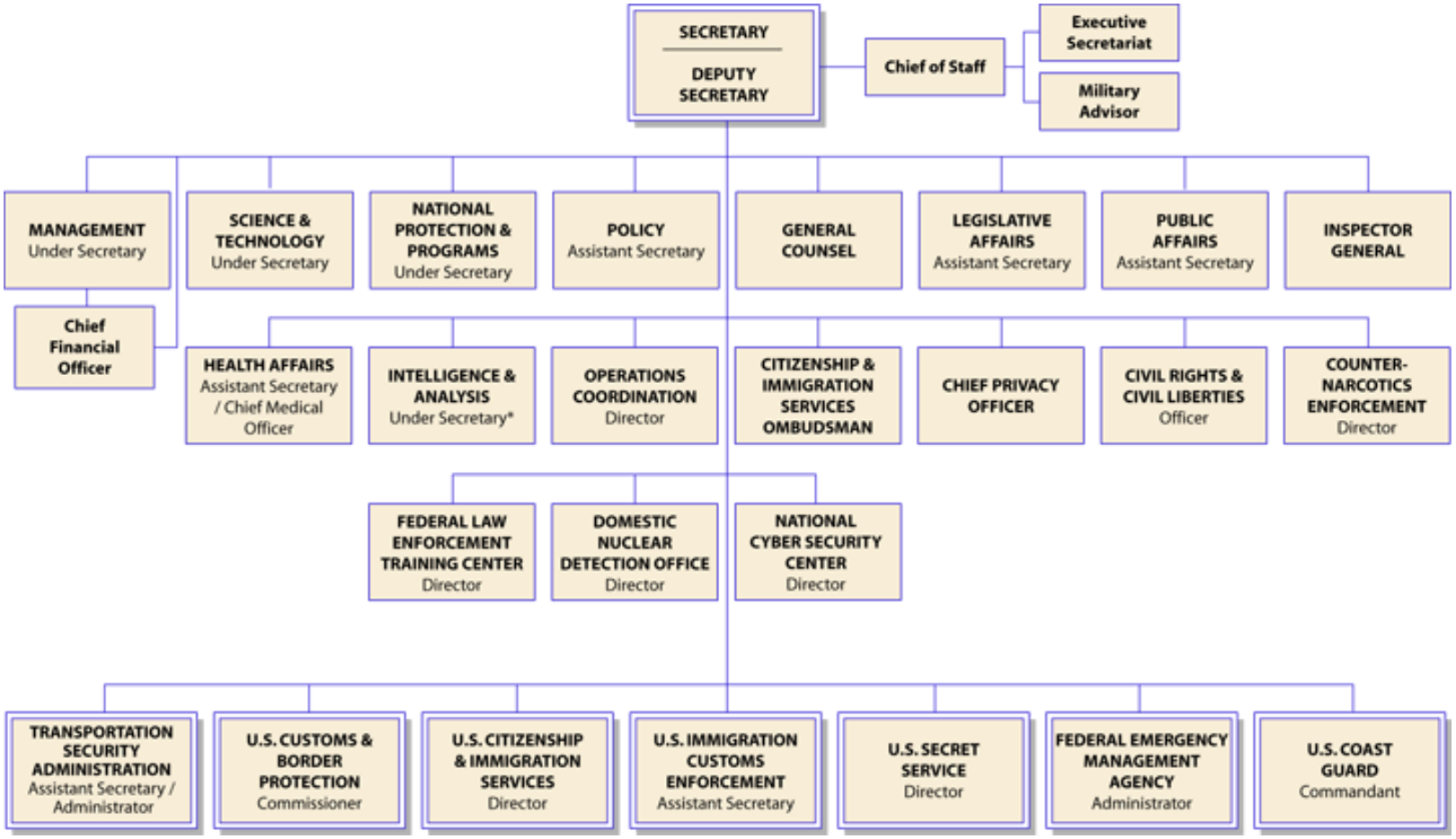


Figure 1. Organization Chart for the Department of Homeland Security (DHS)

http://www.dhs.gov/xlibrary/photos/orgchart-web.png

Much of the impetus for the creation of FEMA and for FEMA's approach to emergency management was a result of initiatives by the National Governor's Association (NGA) to address problems with coordination of both federal and state programs, including separate approaches being used for "civil defense" and "natural disaster" preparedness. A seminal report by the NGA, published in 1978, called for an approach referred to as "Comprehensive Emergency Management (CEM)," described in *Fundamentals of Emergency Management* as follows:

> CEM refers to the development of a capacity for handling emergency tasks in all phases—mitigation, preparedness, response, and recovery—in connection with all types of disaster agents by coordinating the efforts and resources of a wide variety of nongovernmental organizations (NGOs) and government agencies. CEM is distinguished from previous conceptualizations . . . by two important characteristics. First, CEM emphasizes comprehensiveness with respect to the performance of *all disaster relevant activities* by dictating a concern for mitigation, preparedness, response, and recovery. The second distinguishing feature of CEM is its concern with the management of *all types of emergencies* whether technological, natural, or willful (including state sponsored and terrorist attacks). (Lindell 2006)

The CEM approach, subsequently referred to as the "all-hazards" approach, has been the cornerstone for emergency management theory and practice in the U.S. over the past thirty years. The central precepts have been "all hazards" (natural, technological, and other man-made) and "all phases" (mitigation, preparedness, response, and recovery).

Moving FEMA to the new Department of Homeland Security in 2003 revived some of the same issues that were involved with the creation of FEMA in 1978—revolving around differences between (and preferences for) the CEM "all hazards" approach and the need for special focus on "security."

One of the changes made after FEMA moved to DHS was that CEM functions were divided between two components of the department—FEMA and the new DHS Preparedness Directorate (PD). Another change was that official publications and statements started using the terms "prevention" and "protection" along with mitigation, preparedness, response, and recovery.

According to the Congressional Research Service (CRS), "Some contended that, as a result of these mission and organizational shifts, FEMA's capabilities deteriorated as functions, resources, and responsibilities moved to other DHS units. Others argued that an emphasis on terrorist-caused incidents within DHS dominated planning and allocation decisions and contributed to FEMA's diminished capabilities." (Bea 2006)

The issues surrounding FEMA's absorption into DHS were magnified by the federal government's dismal performance in the days after Hurricane Katrina struck New Orleans and the Gulf Coast. Congress apparently concluded that some of the federal problems in dealing with Katrina were

attributable to changes that had been made to FEMA's structure and authority after becoming part of DHS.

One of the results was the *Post-Katrina Emergency Management Reform Act of 2006, which* made significant revisions to FEMA's structure and mission. Although FEMA was left within DHS, the Post-Katrina Act "reorganize[d] DHS with a reconfigured FEMA . . . with consolidated emergency management functions, elevated status within the department, and enhanced organizational autonomy." (Bea 2006)

Because of the Post-Katrina Act, the FEMA Administrator was elevated to the Deputy Secretary level with increased scope of responsibilities, and a statutory advisory relationship to the President, the Homeland Security Council, and the Secretary, particularly during disasters. Like the U.S. Coast Guard and the U.S. Secret Service, FEMA is now classified as a distinct entity within DHS. (Bea 2006)

Most of the programs that had been transferred from FEMA to the Preparedness Directorate within DHS were transferred back to FEMA, including the U.S. Fire Administration, the Office of Grants and Training, the Office of National Capital Region Coordination, and the Center for Faith-Based and Community Initiatives, emergency alert systems, continuity of operations, and continuity of government activities. The Post-Katrina Act also included provisions to expand and strengthen the role of FEMA at the regional level.

According to the CRS report:

> The Post-Katrina Act . . . [restored] to FEMA the responsibility to lead and support efforts to reduce the loss of life and property and protect the nation from all hazards through a risk-based system that focuses on expanded CEM components. The statute also adds a fifth component — protection — to the four CEM components, but does not define the term. (Bea 2006)

The U.S. Code defines FEMA's current mission as follows:

> The primary mission of the Agency is to reduce the loss of life and property and protect the Nation from all hazards, including natural disasters, acts of terrorism, and other man-made disasters, by leading and supporting the Nation in a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation. (6 USC Sec. 313, December 1, 2009)

The current organizational chart for FEMA is shown as Figure 2, and comprehensive information about FEMA services and programs is available on FEMA's website. Figure 3 is a screenshot of the FEMA home page.

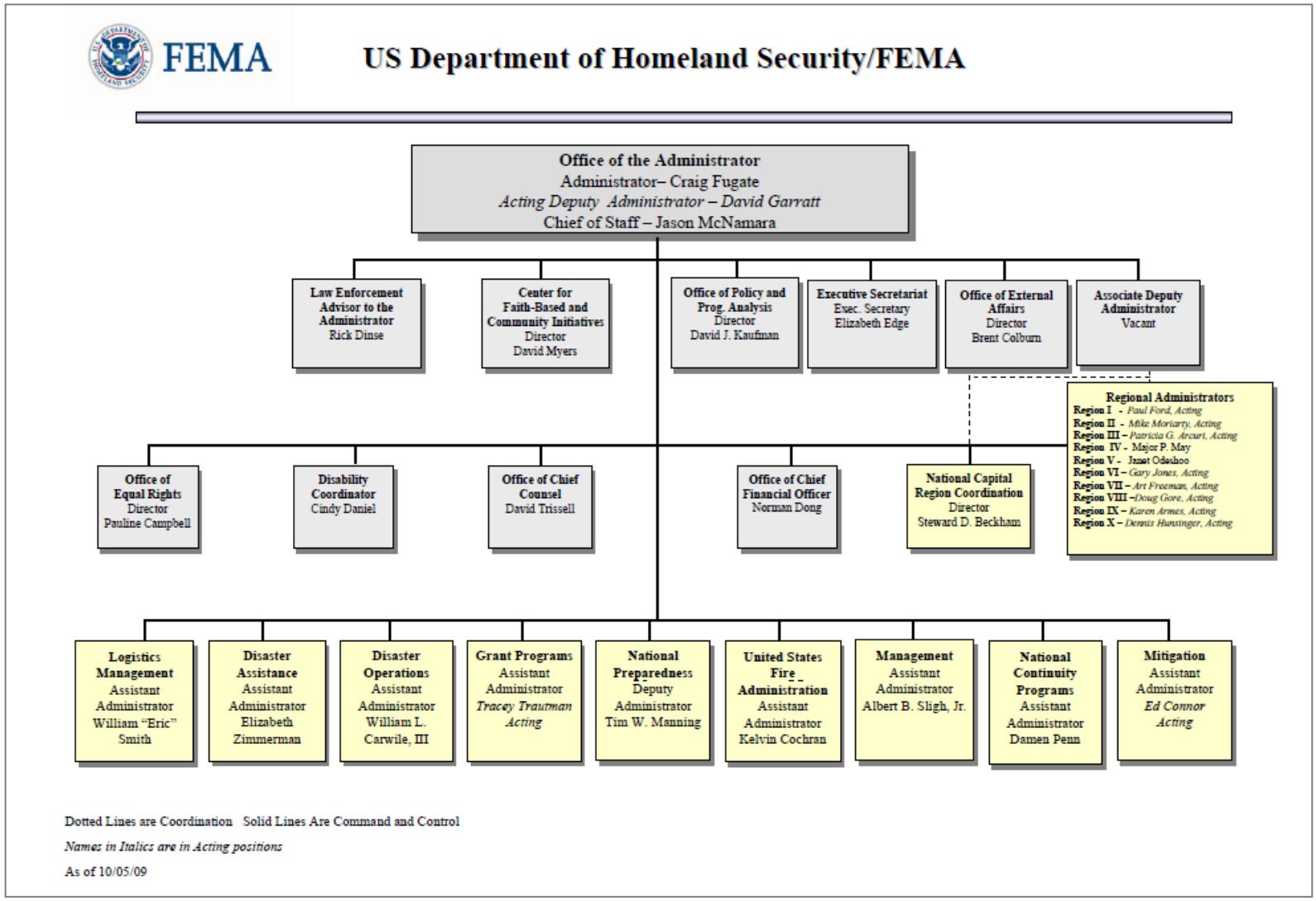


Figure 2. Organizational Chart for the Federal Emergency Management Agency (FEMA) http://www.fema.gov/pdf/about/org_chart.pdf

Figure 3. Federal Emergency Management Agency (FEMA) Home Page
http://www.fema.gov/

Two other FEMA web pages provide links to valuable information for education and research. The page for the FEMA Emergency Management Institute (EMI), headquartered at Emmitsburg, Maryland, is shown as Figure 4. (The National Fire Academy and other offices under the FEMA National Fire Administration (NFA) are also located at Emmitsburg.)

The second web site is a unique source of information to support higher education and research—the FEMA EMI Emergency Management Higher Education Program. The address for that site is http://training.fema.gov/EMIWeb/edu/ . The links that are included on the Higher Education home page are duplicated here as Figure 5 to highlight the range of available information and materials.

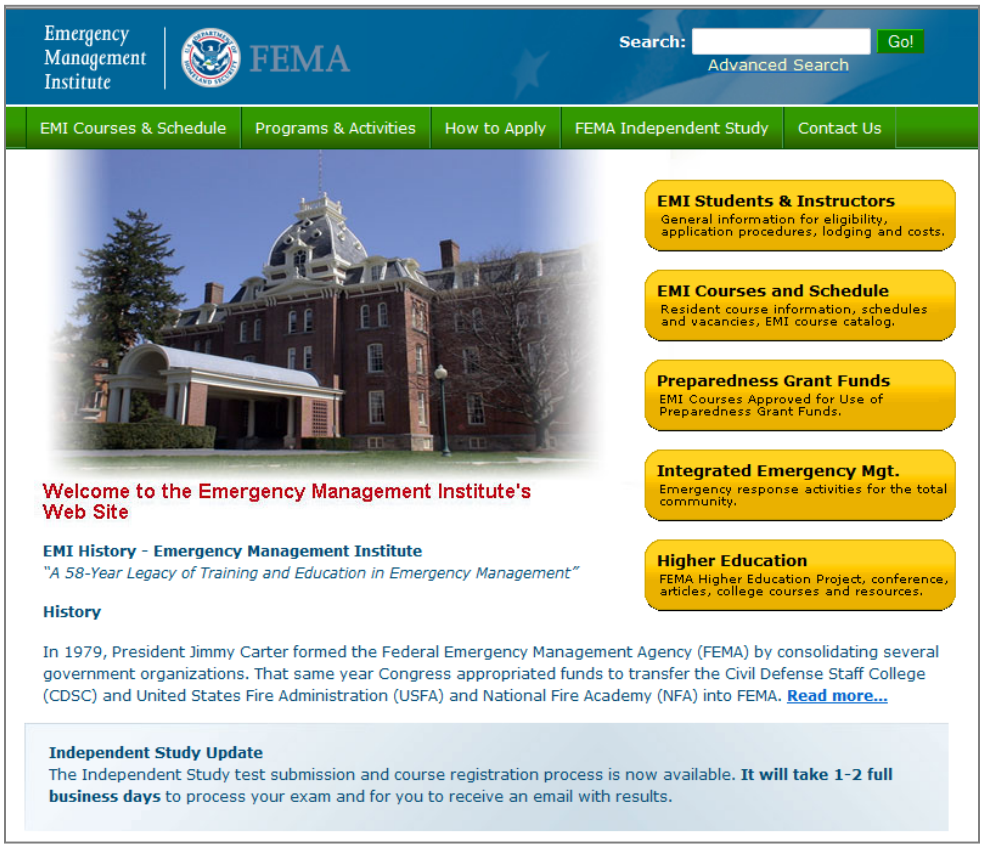


Figure 4. Home Page for the FEMA Emergency Management Institute (EMI)

http://training.fema.gov/EMIWeb/edu/

FEMA Emergency Management Higher Education Program	
The College List EM Hi Ed Pgm. Description Hi Ed Presentation Free College Courses, Textbooks, Materials AD-Level EM & Homeland Security Related Training Courses Syllabi Compilation Growing Your EM Program Experiential Learning EM Terms & Definitions Needs Assessment Tools EM Job Market Data EM Competencies and Curricula Body of Knowledge Proposals Compendium	Articles, Papers and Presentations Surveys EM References EM Principles Student's Corner Practitioner's Corner Hi Ed Conferences EM Hi Ed Reports Foundation of EM HiEd FAQ & Intern Q & A EM Faculty Positions FEMA Contractor Information Collegiate CERT Hi Ed Links

Figure 5. Links on the FEMA Higher Education Project Home Page Link

FEMA also has ten Regional Offices, and those offices have specific responsibilities defined in the Post-Katrina Act. Region IV, headquartered in Atlanta, is FEMA's largest geographic region.[1] Region 4 has more than 100 full-time employees and "a cadre of over 550 Disaster Assistance Employees or 'reservists' experienced in areas ranging from the delivery of disaster assistance to public information and more." Link Figure 6 shows the organization of the FEMA Region IV Office.

<table>
<tr><td colspan="2">Regional Administrator's Office
• Deputy Regional Administrator
• Special Assistant to the Administrator
• External Affairs Director
• Emergency Analyst</td></tr>
<tr><td>Disaster Assistance Division
• Director
• Chief, Individual Assistance Branch
• Chief, Infrastructure Branch</td><td>National Preparedness Division
• Director
• Chief, Program Coordination Branch
• Chief, Technological Services Branch</td></tr>
<tr><td>Mitigation Division
• Director
• Chief, Risk Analysis Branch
• Chief, Hazard Mitigation Assistance Branch
• Chief, Floodplain Management and Insurance Branch</td><td>Administration and Resource Planning Division
• Director
• Chief, Information Technology Services Branch
• Chief, Administrative Services Branch
• Grants Management Branch</td></tr>
</table>

Figure 6. Organization FEMA's Region IV Office
Link (December 1, 2009)

Virtually every department and agency of the federal government has a potential role in emergency management depending on circumstances. Federal involvement is guided by the *National Response Framework (NRF)* and the *National Incident Management System (NIMS),* both of which were prepared by FEMA but rely on numerous other federal agencies to implement. More information about the key documents and supporting material is available at http://www.fema.gov/emergency/nrf/ and http://www.fema.gov/emergency/nims/ respectively.

FEMA administers a suite of federal grant programs related to emergency management, but other federal agencies also administer related programs. Information about grants administered by FEMA and other federal agencies is available through the *Catalog of Federal Domestic Assistance (CFDA),* at https://www.cfda.gov/. Another helpful source is a report by the Congressional Research Service (CRS), titled *Federal Disaster Recovery Programs: Brief Summaries.* (Carolyn Torsell, Congressional Research Service, RL 31734, January 30, 2009). Link

[1] Tennessee and all of the adjacent states except Arkansas and Missouri are part of Region IV. Arkansas is located in Region V and is served by FEMA's Denton, Texas office. Missouri is in Region VII and is served by FEMA's Kansas City Office.

State Emergency Management Agencies

Each of the 50 states has a designated emergency management agency, and those agencies have much in common. Many of their activities are in response to federal requirements and prerequisites for federal grants to state and local agencies. The state EMAs serve in critical positions in all aspects of emergency management, as expressed by Durham and Suiter:

> Local government has traditionally focused on preparedness and response, and the federal government on preparedness and recovery; state government serves as the pivot in the intergovernmental system. As one former governor explained, "The state has to become the key instrument for collecting information and assessing the problem, and deciding the course of action. . . . The state is the quarterback." In its pivotal role, the state is in a position to determine the emergency management needs and capabilities of its political subdivisions and to channel state and federal resources to local government, including training and technical assistance, as well as operational support in an emergency. (Durham 1991)

Some of the similarities and differences among state EMAs are described below, beginning with Table 1, which contains the mission statements found on the web sites for the EMAs in Tennessee and the eight adjacent states. The table also includes links to the web sites for each of the EMAs.

Without knowing more about the internal processes used to develop the mission statements, the significance of the statements to the respective organizations is uncertain. However, each statement presumably indicates the way the organization views itself and expects to be viewed by external stakeholders. Comparing the nine statements does not point to any fundamental differences among the agencies. Some general observations about similarities:

- All but one of the statements incorporate references to the traditional four phases of emergency management (mitigation, preparedness, response, and recovery) although not all in the same order
- Possibly reflecting increased concerns for terrorism, the word “protect” is used in four of the nine, although none use “protect” as a “phase,” and none use the word “prevent”
- Two of the statements indicate that the basic mission is to “provide a management system,” and another indicates to “provide an . . . approach”
- Several refer to helping local governments, and one refers to assisting with disasters and emergencies “which a local emergency response agency determines is beyond its capabilities.”

Also, none use terms such as “customer” or “partner” or “stakeholder,” but three include phrases that help define their customers without using the word:

- disaster victims as well as . . . local government
- state and local governments, qualifying not for profit organizations and Arkansas citizens
- all Missourians

Table 1. Mission Statements from State Emergency Management Agencies, Tennessee and the Eight Adjacent States

Tennessee Link	TEMA is responsible for ensuring the establishment and development of policies and programs for emergency management at the state and local levels. This responsibility includes the development of a statewide capability to mitigate against, prepare for, respond to, and recover from the full range of emergencies, both natural and technological. The Goal: To make Tennesseans safe from disaster; to reduce the physical harm and financial losses suffered from those events.
Alabama Link	It is the mission of the AEMA to assist the needs of disaster victims as well as assisting local government in preparedness, response and recovery. The mission of the Alabama Emergency Management Agency during a disaster is to assist disaster victims and first responders. On a day-to-day basis, AEMA works with local emergency managers to create preparedness, response & recovery before and following a disaster. Alabama's partnership with neighboring states is really important. Typically what effects one state will likely have an impact on others. Within the state, AEMA works to build partnerships and continue fostering relationships with primary state agencies. A major disaster will require assistance from federal agencies, therefore AEMA meet & coordinate with our federal partners during non-disaster times. The overall mission of this agency is to ensure the safety of Alabama residents, but it's important that everyone understands they have a key role to play in this process and it starts with them being prepared.
Arkansas Link	Mission Statement: To provide a management system that effectively and efficiently provides preparedness for, mitigation of, response to and recovery from the effects of natural and man-caused disasters for state and local governments, qualifying not for profit organizations and Arkansas citizens.
Georgia Link	GEMA's mission is to provide a comprehensive and aggressive all-hazards approach to mitigation, preparedness, response, recovery and special events. The purpose of our mission is to protect life and property and to prevent and/or reduce the negative impact of natural and man-made events in Georgia.
Kentucky Link	Provide a comprehensive Emergency Management System to protect life and property, public peace, health, safety and the environment of the Commonwealth of Kentucky through an ALL HAZARDS approach to mitigation, preparedness, RESPONSE and RECOVERY from disasters and emergencies which a local emergency response agency determines is beyond its capabilities.
Mississippi Link	Our mission is to ensure that Mississippi is prepared to respond to emergencies, recover from them, and mitigate against their impacts.
Missouri Link	To protect the lives and property of all Missourians when major disasters threaten public safety in any city, county or region of Missouri. SEMA responds to two types of disasters - natural and manmade. Natural disasters are major snow and/or ice storms, floods, tornadoes and/or severe weather, as well as the threat of a serious earthquake along Missouri's New Madrid Fault. Manmade disasters, also known as technological emergencies, may include hazardous material incidents, nuclear power plant accidents and other radiological hazards. SEMA is also responsible for developing a State Emergency Operations Plan which coordinates the actions of Missouri state government departments and agencies in the event of any emergency requiring use of State resources and personnel.
North Carolina Link	In cooperation with our partners, we are committed to enhancing the quality of life in North Carolina by assisting people to effectively prepare for, respond to, recover from, and mitigate against all hazards and disasters.
Virginia Link	The Virginia Department of Emergency Management – Protecting the lives and property of Virginia's citizens from emergencies and disasters by coordinating the state's emergency preparedness, mitigation, response and recovery efforts.

Another way to compare the state EMAs is to examine their organizational placement within the respective state governments, as shown in Table 2. The single most common arrangement is for the EMA to be part of the state's military department, reflecting the historical importance of "civil defense" in the development of emergency management. Other states have located the agency within the Governor's office perhaps because of the overarching responsibilities of the EMAs and/or the role of the Governor in disaster declarations and dealing with extreme events. Placing the EMA within the state's public safety or law enforcement agency may reflect an emphasis on efficient organization of state resources into a relatively small number of departments. Placement within the state's homeland security department may have involved some of the same considerations as occurred at the national level, attempting to integrate the all-hazards approach with measures to counter the new threats of terrorism.

Table 2 . Organizational Structures for State Emergency Management Agencies

Governor	Adjutant General/ Military Affairs	Homeland Security	Public Safety	State Police	Other
13	18	4	12	2	4
Alabama Arkansas California Connecticut Florida Georgia Illinois Louisiana Mississippi New York Oklahoma Pennsylvania Northern Mariana Islands	Alaska Arizona Idaho Iowa Kansas Kentucky Maine Maryland Montana Nebraska North Dakota Oregon Rhode Island South Carolina Tennessee Washington Wisconsin U.S. Virgin Islands	Delaware Indiana District of Columbia Guam	Massachusetts Minnesota Missouri Nevada New Hampshire North Carolina Ohio South Dakota Texas Utah Vermont Virginia	Michigan New Jersey	Colorado Hawaii New Mexico West Virginia

Note: Wyoming not included
Source: National Emergency Management Association, January 2008, http://www.nemaweb.org/default.aspx?ID=2076 (November 1, 2009)

Table 3 examines more closely the relationships between emergency management and homeland security in Tennessee and the adjacent states. The most common arrangement among these nine states is to have two separate agencies. In two other states (Arkansas and Georgia) the responsibilities for homeland security are assigned within the EMA. In the remaining two states (Missouri and North Carolina) both homeland security and emergency management are housed within state agencies with overall responsibility for public safety.

Table 3. Organization for Emergency Management and Homeland Security at the State Level Tennessee and Adjacent States

State	Responsibilities	
	Emergency Management	Homeland Security
Tennessee	Tennessee Emergency Management Agency (Tennessee Military Department)	Tennessee Department of Safety (separate office for homeland security)
Alabama	Alabama Emergency Management Agency	Alabama Department of Homeland Security
Arkansas	Arkansas Department of Emergency Management	
Georgia	Georgia Emergency Management Agency	
Kentucky	Kentucky Division of Emergency Management (Dept. of Military Affairs)	Kentucky Office of Homeland Security
Mississippi	Mississippi Emergency Management Agency	Mississippi Office of Homeland Security
Missouri	Missouri Department of Public Safety	
North Carolina	North Carolina Department of Crime Control and Public Safety	
Virginia	Virginia Department of Emergency Management (reporting to Public Safety)	Office of Commonwealth Preparedness (Office of the Governor)

Source: Websites for each state.

Table 4 also focuses on Tennessee and the adjacent states. The table shows that the EMAs are relatively small agencies, in terms of both operating budgets and personnel. For comparison, the FY 2009-2010 budget for the State of Tennessee has almost 4,900 positions for the Tennessee Department of Transportation (TDOT) and more than 1,700 for the Tennessee Department of Safety. However, the table also shows that, regardless of the budgets or numbers of staff or organizational placement, the Governor appoints the director of the EMA in eight of the nine states.

Another way to compare the EMAs is to examine how the states administer the National Flood Insurance Program (NFIP), which is administered at the federal level by FEMA as one of their "mitigation" programs. As shown in Table 5 only three of the nine states have assigned the state's role in the NFIP to their emergency management agencies. The NFIP program was enacted by Congress in 1972, and one source refers to the assignment of the program to other than EMAs as an "illustration of the fragmented and piecemeal approach to emergency management that evolved during the 1960s and 1970s." (Haddow 2008)

Table 4. State Emergency Management: Agency Structure, Budget and Staffing

State	Appointed By	Organizational Structure	Operating Budget	Full-Time Employee Positions
Tennessee	Governor	Adjutant General/Military Affairs	$4,000,000	109
Alabama	Governor	Governor's Office	$2,900,000	103
Arkansas	Governor	Governor's Office	$2,593,474	82*
Georgia	Governor	Governor's Office	$2,382,120	109
Kentucky	Adjutant	Adjutant General/Military Affairs	$3,137,299	82
Mississippi	Governor	Governor's Office	$6,000,000	120
Missouri	Governor	Public Safety	$3,000,000	70
North Carolina	Governor	Public Safety	$9,280,307	178
Virginia	Governor	Public Safety	$13,700,000	124

* Includes both homeland security and emergency management positions
Source: National Emergency Management Association, January 2008

Table 5. State Coordinating Agencies for the National Flood Insurance Program

State	Overall Responsibilities of Designated State Agency for National Flood Insurance Program		
	Natural Resources	Economic/Community Development	Emergency Management
Tennessee		Department of Economic & Community Development	
Alabama		Department of Economic & Community Affairs	
Arkansas	Natural Resources Commission		
Georgia	Department of Natural Resources		
Kentucky	Division of Water (Energy and Environment Cabinet)		
Mississippi			Emergency Management Agency
Missouri			Emergency Management Agency
North Carolina			Division of Emergency Management
Virginia	Department of Conservation & Recreation		

Source: Association of State Floodplain Managers, December 1, 2009. Link (December 1, 2009)

As stated at the beginning of this section, the EMAs are similar in many respects because they must comply with federal requirements and prerequisites. FEMA also influences the state EMAs through guidelines, suggestions, models, and dissemination of "best practices" information. Table 6 compares the Emergency Support Functions (ESFs) in the National Response Framework (NRF) with the ESFs in the state-prepared emergency plans for Tennessee, Arkansas, and Mississippi. The states are not required to mirror the federal ESFs. (FEMA 2009) However, Table 6 shows only minor variations in the ESFs used at the federal level and those used by the three states.

Finally, Table 7 compares the organizational structure of the state EMAs in Arkansas, Mississippi, and Tennessee. Examining the information in Table 7 and the websites for the three EMAs provides more detail about the functions of state EMAs. For instance, the Arkansas Department of Emergency Management (ADEM) site includes detailed organizational charts and shows that ADEM's three largest branches in terms of numbers of positions are Training and Exercise (ten positions), Communications (nine positions) and Planning (eight positions). Most of the positions in the ADEM Communications Branch are classified as Duty Officer, to staff the 24/7 emergency communication center and to help activate the state's Emergency Operations Center (EOC) when necessary. (Link to "ADEM Org. Chart")

The Mississippi Emergency Management Agency (MEMA) describes their Communications Section as the "designated state warning point," and adds the following:

> Operating 24 hours a day, seven days a week, the Communications Section has the responsibility for alerting state and local officials to all natural or man-made incidents throughout the state. These alerts include such things as severe thunderstorms, tornadoes, hurricanes, earthquakes or hazardous materials incidents.
>
> Communications capability includes satellite, low band and UHF radios. A computerized alphanumeric paging system and wireless e-mail devices allow for rapid notification of all MEMA personnel as well as personnel in all 82 counties. Through MEMA, the National Alert Warning System has been increased to 100 locations that include state, federal and local jurisdictions. A high-speed digital fax system has enhanced the ability to rapidly communicate . . .
>
> The use of Web EOC, an incident management software system, extends the State EOC to all 82 counties through a Web-based tracking system. The system allows for the immediate tracking of resources, requests and personnel for any events that affect the state. Link

These websites also describe certain functions that reflect situations not common to all states. All three of these states, for instance, have nuclear power plants within their borders. This requires special planning and training and participation in periodic exercises along with FEMA and sometimes the Nuclear Regulatory Commission. Arkansas also participates in a special federal program known as the Chemical Stockpile Emergency Preparedness Program (CSEPP) because of materials at the Pine Bluff Arsenal. Link

Closer examination also points to close relationships between the state EMAs and the local governments and local EMAs. The Tennessee EMA for instance has about 1/3 of their positions assigned to region offices. Also, TEMA describes their training branch as "responsible for the training of emergency

Table 6. Emergency Support Functions (ESFs) Used in the National Recovery Framework and Selected State Emergency Plans

National Response Framework	Tennessee Emergency Management Plan	Arkansas Emergency Operations Plan	Mississippi Comprehensive Emergency Plan
ESF #1 – Transportation	ESF 1 - Transportation	ESF 01 - Transportation	ESF #1 – Transportation
ESF #2 – Communications	ESF 2 - Communications	ESF02 - Communications	ESF #2 – Communications
ESF #3 – Public Works and Engineering	ESF 3 - Infrastructure	ESF03 - Public Works and Engineering	ESF #3 – Public Works and Engineering
ESF #4 – Firefighting	ESF 4 - Firefighting	ESF04 - Firefighting	ESF #4 – Firefighting
ESF #5 – Emergency Management	ESF 5 - Information and Planning	ESF 05 - Emergency Management	ESF #5 – Emergency Management
ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services	ESF 6- Human Services	ESF 06 - Mass Care, Housing and Human Services	ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services
ESF #7–Logistics Management and Resource Support	ESF 7 - Resource Support	ESF 07 - Resource Support	ESF #7 – Resource Support
ESF #8 – Public Health and Medical Services	ESF 8 – Public Health and Medical Services	ESF 08 - Health and Medical	ESF #8 – Public Health and Medical Services
ESF #9 – Search and Rescue	ESF 9 - Search and Rescue	ESF 09 - Search and Rescue	ESF #9 – Urban Search and Rescue
ESF #10 – Oil and Hazardous Materials Response	ESF 10 - Environmental Response	ESF 10 - Oil and Hazardous Materials	ESF #10 – Oil and Hazardous Materials Response
ESF #11 – Agriculture and Natural Resources	ESF 11 - Food	ESF 11 – Agriculture and Natural Resources	ESF #11 – Animals, Agriculture, and Natural Resources
ESF #12 – Energy	ESF 12 - Energy	ESF 12 - Energy	ESF #12 – Energy
ESF #13 – Public Safety and Security	ESF 13 - Law Enforcement	ESF 13 - Public Safety and Security	ESF #13 – Public Safety and Security
ESF #14 – Long-Term Community Recovery	ESF 14 - Donations and Volunteers	ESF 14 - Long-Term Community Recover and Mitigation	ESF #14 – Long-Term Community Recovery
ESF #15 – External Affairs	ESF 15 - Recovery	ESF 15 - External Affairs	ESF #15 – External Affairs

Sources: *National Recovery Framework, Tennessee Emergency Management Plan, Arkansas Emergency Operations Plan,* and *Mississippi Comprehensive Emergency Plan.*

management professionals in TEMA, as well as hundreds of other responders throughout the state and county governments who must respond to emergencies and assist in the recovery." Also, "trainers from local jurisdiction departments or agencies often assist [TEMA] to add to its capabilities." Link

Finally, the ADEM website provides an informative review of the history of state-level emergency management in Arkansas. The review begins with the creation of the State Civil Defense Agency in 1953.

Table7. Organizational Structure for Three State Emergency Management Agencies

Arkansas Department of Emergency Management (ADEM)	Mississippi Emergency Management Agency (MEMA)	Tennessee Emergency Management Agency (TEMA)
ADEM has four divisions reporting to the Director's Office: – Preparedness Division – Administration Division – Disaster Management Division – Information Technology Division ADEM organizational charts are available at: Link http://www.adem.arkansas.gov/	MEMA is divided into five offices: Mitigation - helps prevent damage and loss of life and property in future disasters Preparedness -in charge of all emergency plans and training programs in the state Recovery - in charge of all recovery operations such as public assistance reimbursement Response - in charge of coordinating the state's response to any natural or man-made emergency through the State Emergency Operations Center Support Services - in charge of all financial and personnel issues for the agency MEMA has nine districts with an area coordinator . . . as a liaison between the county emergency operations centers and MEMA. http://www.msema.org/index.html	Director of TEMA Assistant Agency Director for Response Assistant Agency Director for Preparedness Executive Command Staff Executive Administration Officer Executive Officer Finance Officer Public Information Officer Human Resources Manager Administrative Asst. to the Director TEMA Departments - Branches Operations and Communications Branch Planning, Exercises and Mitigation Branch Training Branch Grants and Programs Branch Agency Support Branch TEMA has three Region offices. http://www.tnema.org/about/structure.html

Local Emergency Management Agencies

The local emergency management agency often serves multiple roles. One source (*Emergency Management: Principles and Practice for Local Government)* includes this description:

> Emergency management fulfills two roles within the structure of local government: first, it is part of local government's overall administrative functions. Specifically, the emergency management department takes the lead in mitigation, preparedness, response, and recovery. Second, the emergency management department leads organizational efforts to ensure business continuity for the local government. The development of redundant communications systems and the safe caching of vital records are examples of such activities. (Edwards 2007, 40)

In addition to the two roles described above, the local EMA must represent their community in dealing with the state EMA and with FEMA. The local EMA must also work daily to build and maintain effective working relationships with law enforcement agencies, fire and rescue services, emergency medical services, and other first responders.

Table 8 presents mission statements from a dozen local emergency management agencies. These were selected randomly from internet searches, with a goal of including EMAs from a representative group

Table 8. Missions Statements from Selected Local Emergency Management Agencies

Agency (State)	Description of Mission (from Agency's Web Site)
Memphis and Shelby County (TN) Emergency Management Agency Link	Mission: To provide the most efficient and effective coordination of resources available in the mitigation of; planning and preparation for; response to and recovery from emergencies and disasters. We assist local, state, and federal agencies with response, or EOC activation, for major fires, hazardous material incidents, bomb threats, special rescue operations, aircraft disasters, . . . evacuations, terrorist events and any other emergency or disaster operation that requires a multi-agency/multi-jurisdictional response. EMA has a National Weather Service satellite downlink and is responsible for activating the tornado sirens for Memphis, Millington, Lakeland, and the un-incorporated areas of Shelby County. Other duties that are handled by our Emergency Technicians are dispatching for Housing and Community Development, Code Enforcement Officers, after hours dispatching for Traffic Signal Maintenance, Animal Shelter, and monitoring Flood Control alarms.
Jackson-Madison County (TN) Emergency Management Agency Link	The mission of the Jackson-Madison County Emergency Management Agency is to protect and preserve life and property through the development and establishment of comprehensive emergency management policies and programs for all local levels. It is also to ensure the safety and welfare of the populace by developing and maintaining a capacity to mitigate against, prepare for, respond to, and recover from any natural, technological, or man-made emergency.
Mayor's Office of Emergency Management, Metropolitan Nashville-Davidson County (TN) Link	The mission of the Metro Nashville Mayor's Office of Emergency Management is to develop, coordinate and lead the local emergency management program, enabling effective preparation for and efficient response to emergencies and disasters in order to save lives, reduce property loss and stop human suffering. To accomplish this mission, the Emergency Management Office: – Develops plans and procedures to ensure the highest level of mitigation, preparedness, response and recovery. – Maintains a comprehensive, risk-based, multi-hazard emergency management and training program. – Coordinates federal, state and local resources for mitigation, preparedness, response and recovery operations.
Rutherford County (TN) Emergency Management Agency Link	The Rutherford County Emergency Management Agency is charged with the overall responsibility of coordinating the county's preparedness for and response to disasters. Geographically, its authority extends to the entire county as defined by TCA 58-2-110. The mission of the Emergency Management Agency is to develop a comprehensive emergency management program that seeks to: mitigate the effects of various hazards, to prepare for measures which will preserve life and minimize damage, to respond during emergencies, to provide assistance, and to establish a recovery system to return the community to a normal status after an event. This agency combines the local resources of Rutherford County . . [and three cites] along with State and Federal resources to mitigate, prepare for, respond to, and recover from the effects all types of emergencies including natural or man-made disasters, technological accidents, national security threats, and other disrupting incidents that may impact our area or the general population.
Cleveland-Bradley County (TN) Emergency Management Agency Link	The mission of the Cleveland-Bradley County Emergency Management agency is to provide the highest level of emergency preparedness to the citizens of Cleveland and Bradley County as they face new challenges in the 21st century. Working as inter-agency coordinators in partnership with local, state, federal and private entities, we seek to provide comprehensive emergency response, hazard planning and disaster mitigation to Cleveland and Bradley County.

Jefferson County (AL) Emergency Management Agency Link	The overall goal of the Emergency Management Agency may be stated as follows: To save lives and protect property by developing programs and emergency operational capabilities that mitigate, prepare for, respond to, and recover from any emergency or disaster. Local government is recognized as the first line of official public responsibility for emergency management activity. The role of the Jefferson County EMA, as the focus of the planning effort, is to develop and maintain an ongoing program of mitigation, preparedness, response, and recovery. The emergency management agency serves the chief executive by working with the departments of local governments and private sector organizations in the development of plans and capabilities. . . .
Garland County (AR) Department of Emergency Management Link	The GCDEM mission statement can best be summed up with only four words: – MITIGATION: Participate in state-sponsored mitigation activities. – PREPAREDNESS: Enhance existing preparedness activities… – RESPONSE: Provide coordination and support to local, state and federal response activities to insure most effective and efficient use of local personnel, equipment and resources. – RECOVERY: Provide necessary support to local government, state and federal disaster recovery operations and activities.
Little Rock (AR) Emergency Management Division Link	The LRFD Emergency Management Division is responsible for emergency preparedness and disaster planning, as well as coordinating efforts of multiple agencies during disaster response and recovery efforts. This division is also charged with the operation and maintenance of the City's Outdoor Warning System. Along with the emergency management functions . . . it is also responsible for the management of the City's state and federal disaster preparedness and Homeland Security Grants, including the CERT Program.
The Atlanta-Fulton County (GA) Emergency Management Agency Link	Some primary responsibilities include: – Maintain the Emergency Operations Center . . . in a constant state of readiness – Coordinate with the incorporated municipalities, Fulton County, and the City of Atlanta to maintain the Emergency Operations Plan (EOP) – Develop, coordinate and conduct emergency management training exercises – Provide a liaison to local, state and federal authorities during major disasters – Develop, coordinate and maintain mutual aid agreements – Provide 24-hour emergency notification to multiple response agencies – Develop and deliver emergency management presentations, brochures, pamphlets . . . and other information for civic organizations, business and industry, emergency response agencies, government, media and the public
Louisville and Jefferson County (KY) Emergency Management Agency Link	The Louisville Metro Emergency Management Agency (EMA) is responsible for preparation, mitigation, response, and recovery from natural and manmade disasters through advance coordination with local, state and federal agencies. The agency follows the operational guidelines in the *Emergency Operations Plan* in disaster management.
DeSoto County (MS) Emergency Management Agency Link	The Emergency Management Agency is charged with the development and maintenance of a Comprehensive Emergency Management Program in coordination and planning with local, state, federal and private agencies in order to protect life and property from natural and manmade hazardous events. The program seeks to mitigate the effects of an occurrence, respond during emergencies and provide necessary assistance, and to establish a recovery system in order to return the community to its normal state of affairs as soon as possible. This agency is also charged with establishing, maintaining, and operating an Emergency Operations Center from which officials can conduct [emergency/disaster] operations . . .
Warren County (MS) Emergency Management Agency Link	The Warren County Emergency Management Agency is responsible for maintaining an all hazard capability to save lives and protect the property of the citizens of Warren County through mitigation, preparedness, response and recovery.

of communities in the IFTI area. Of the twelve EMAs selected, five are joint city/county agencies in the core of large urban areas (Atlanta, Birmingham, Louisville, Memphis, and Nashville). Two more of the selected EMAs serve rapidly developing counties in metropolitan (DeSoto County, Mississippi, and Rutherford County, Tennessee). The remaining five serve smaller urban areas and rural counties in Arkansas, Mississippi, or Tennessee.

EMAs for rural areas are almost certainly underrepresented in this group since they are less likely to have a web page. In addition, many smaller communities do not have separate EMAs or full-time staff. The responsibilities may be delegated to another public official (e.g. fire or police chief, public works director) or even an experienced volunteer.

Assessment of the twelve mission statements in Table 8 reveals the following:

- Seven of the twelve refer to the traditional phases of emergency management in a single phrase— "mitigate , prepare, respond, and recover" or some variation of the same
- Eight of the EMAs use the word "coordinate" at least once in their mission statement; several others use "assist" or "provide assistance to"
- Words such as "the public," "citizens," and "local, state, and federal agencies" are used to describe the EMAs' customers
- Three of the missions statements refer to operation of the local Emergency Operations Center (EOC)
- Two refer to training others as part of the EMA's mission
- Two refer to the operation of outdoor warning systems (warning sirens)

Nine of the statements refer to "preparedness;" ten to "mitigation; and ten to "recovery." All twelve refer to "response" as part of their mission statement.

Arguably, "response" is the phase for which EMAs have the most direct authority. Regardless, in most communities "response" is the phase for which the EMA is most accountable. The authors of a textbook, *Introduction to Emergency Management,* quote an unnamed but "well-respected" state emergency manager as saying "I won't lose my job if I don't mitigate, but I will lose my job if I don't respond." (Haddow 2008, 387) This quote is attributed to a state EMA director, but it seems applicable for most local directors as well.

State Emergency Response Commissions (SERCs) and Local Emergency Planning Commissions (LEPCs)

Under the federal Emergency Planning and Community Right-To-Know Act (EPCRA), an amendment to the Superfund Amendments and Reauthorization Act of 1986 (SARA), each state is required to create a State Emergency Response Commission (SERC) and those state commissions are then required to designate Local Emergency Planning Commission (LEPCs). The SERCs and LEPCs have a range of responsibilities related to hazardous materials.

The duties of the SERC under EPCRA involve appointment and oversight of the local groups, record keeping and reporting relative to hazardous materials within the state (including information about spills and releases), and reviewing local emergency response plans. In most states, the state EMA provides staff support for the SERC, and many stakeholders may assume that the EMA is the same as the SERC.

The EPA is the primary federal agency for implementation of EPCRA/SARA provisions, and the EPA Region 6 website provides this description of the purpose of LEPCs:

- Development, training, and testing of the hazardous substances emergency response plan for the community
- Development of procedures for regulated facilities to provide informational and emergency notification to the LEPC
- Development of procedures for receiving and processing requests from the public under EPCRA
- Provision for public notification of LEPC activities
- A major role for LEPCs is to work with industry and the interested public to encourage continuous attention to chemical safety, risk reduction, and accident prevention by each local stakeholder. Link

In most states an LEPC has been established for each county although multi-county LEPCs are permissible. Since the functions of EMAs, also usually organized on a county level, are so closely related to LEPCs it seems not surprising that many local EMAs provide staff support for the LEPC, and the distinctions between the two organizations may be imperceptible. According to a white paper titled *The Practical Evaluation of Local Emergency Planning and Preparedness,* by the National Association of SARA Title III Program Officials:

> LEPCs are frequently organized within the offices of a first response agency or local government office of emergency management. In such cases it can be difficult to identify where the parent agency's activities end and the LEPC's begin. The functions are obviously complementary and therefore that distinction is frequently misleading or of little importance in the day-to-day planning and preparedness of the community. (NASTTPO 2009)

Non-Governmental Organizations (NGOs) and Other Volunteer and Private Organizations

Private, non-profit organizations, businesses, and individual volunteers are important partners in emergency management. These organizations are mentioned here because one of the important responsibilities for EMAs is to coordinate with and among these other organizations. Also, without these organizations, the demands on EMAs and other public agencies could be overwhelming.

The emergency management community frequently uses the term "non-governmental organizations" to refer to private, non-profit organizations such as the American Red Cross and other organizations that work closely with EMAs to provide "mass care" support during disaster response and recovery. The Red Cross, which has the legal status of "a federal instrumentality," began providing disaster assistance long before the federal government. Congress chartered the Red Cross in 1905. (Haddow 2008, 170)

Other national organizations that are organized and trained to assist with disasters include the Salvation Army and other faith-based organizations. Examples include the Seventh Day Adventists (manages donations), Mennonite Disaster Service (rebuilds low-income homes), Church of the Brethren (provides childcare), Southern Baptists (provides mobile kitchens, showers, and labor) and Habitat for Humanity (rebuilds low-income homes). (Phillips 2007)

The National Voluntary Organizations Active in Disaster (NVOAD) serves as a coordinating agency to help ensure the most effective use of all volunteers. In September 2009, NVOAD's web site listed 50 national members and state/local VOADs in all of the states.

At the state and local level, EMAs also work closely with the Civil Air Patrol, volunteer rescue squads, and other organizations that have special skills and resources for emergency response.

In addition to the NGOs, FEMA has fostered the Citizen Corps, a "grassroots strategy to bring together government and community leaders to involve citizens in all-hazards emergency preparedness and resilience." With the support of state and local EMAs, volunteers have been organized and trained to enhance personal and family preparedness and to address special needs through the following programs:

- Community Emergency Response Teams (CERT)
- Fire Corps
- Medical Reserve Corps (MRC)
- USAonWatch (UOW)-Neighborhood Watch
- Volunteers in Police Service (VIPS)

More information about Citizens Corps is available at http://www.citizencorps.gov/, and more information about the partner programs is available at http://www.citizencorps.gov/programs/.

EMAs also work with organizations and coordinating groups that focus on homeland security, including the InfraGard program, regional coordinating groups including the Urban Area Security Initiatives (UASIs), and interagency groups to facilitate information sharing for law enforcement and security.

Emergency management agencies also work closely with the private sector. Increasingly, EMAs are forging multi-faceted partnerships with private companies. Private companies own many components of our national "critical infrastructure and key resources (CIKR)." These assets need to be protected and, in the event of damage, restored as quickly as possible. (More information about CIKR, including Homeland Security Presidential Directive 7, is available from the Department of Homeland Security. Link**)**

In addition, private companies can provide resources and expertise to help with disaster response and recovery, especially those companies that have direct knowledge of the impacted area and also have significant resources that can be mobilized from other, unaffected areas. Economic recovery of the community will depend largely on how quickly and how completely private employers are back in

business, and that will depend in part on decisions made by the emergency management agency. These interdependencies and mutual interests provide a solid foundation for cooperation.

Further, private companies in the transportation business have close working relationships with many of the NGOs that are critical to emergency response. For instance, the 10-K report filed with the Security and Exchange Commission by Federal Express for 2008 includes the following:

> We work with the following global organizations to assist in relief, recovery and disaster-preparedness planning efforts:
>
> - *American Red Cross:* We have provided in-kind shipping, financial support and volunteers to the American Red Cross for more than a decade. We are the organization's largest transportation donor and are recognized as the backbone of its U.S. disaster logistics system.
> - *Salvation Army:* We provide support for Salvation Army Disaster Response Services. We have provided the Salvation Army with the funding to purchase 13 Emergency Services Response Units — canteen trucks that are deployed during emergencies and disasters and are capable of feeding thousands of people per day.
> - *Heart to Heart International:* Through our relationship with Heart to Heart International, we have moved disaster relief supplies to many countries throughout the world. (FedEx 2009)

Collaboration, Research, and Professional Development

Emergency management agencies and emergency managers collaborate in a number of ways and build networks for their parent governments to work together. Mutual aid agreements are important to emergency preparedness, and one such agreement has national significance. The Emergency Management Assistance Compact (EMAC) provides a legal foundation and standard procedures for sharing of resources across state boundaries. Issues such as liability and reimbursement are resolved so that emergency response can occur immediately. EMAC, which has been ratified by Congress, is administered by the National Emergency Management Association (NEMA).

NEMA describes itself as "the professional association of and for emergency management directors from all 50 states, eight territories and the District of Columbia." However, NEMA welcomes members under five categories: state member, key state staff, corporate member, organizational member, and individual member. Link

Another organization, the International Association of Emergency Managers (IAEM) is a "non-profit educational organization dedicated to promoting the goals of saving lives and protecting property during emergencies and disasters." Headquartered in Arlington, Virginia, the IAEM reports more than 5,000 members in 58 countries. Link

One of the IAEM programs is the Certified Emergency Manager program for individuals. To be designated as a CEM, persons must satisfy requirements under five categories and pass a written examination. The categories in addition to the exam are emergency management experience, education, training, contributions to the profession, and comprehensive emergency management essay.

Another professional organization is the Association of State Floodplain Managers (ASFPM), representing "professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery." The ASFPM also administers a certification program for individuals. The CFM® is a registered trademark of the Certified Floodplain Manager Program.

Another certification program is available for emergency management *organizations*—through the Emergency Management Accreditation Program (EMAP). The EMAP is an independent non-profit organization that uses a "standard-based voluntary assessment and peer review accreditation process." EMAP is an affiliate of The Council of State Governments (CSG). Organizations involved in creating EMAP included NEMA, International Association of Emergency Managers (IAEM), several federal agencies (including the UDSOT), National Governors Association, National League of Cities, CSG, National Conference of State Legislatures, and the National Association of Counties. As of December 2009, 25 agencies had received EMAP accreditation, 3 local EMAs and 22 state EMAs. The states with accredited EMAs include Alabama, Georgia, Missouri, North Carolina, Tennessee, and Virginia.

Local emergency management agencies also interact though state level associations. Examples include the Arkansas Emergency Management Association, the Missouri Emergency Preparedness Association, and the Emergency Management Association of Tennessee.

Much of the research that provides the foundation for emergency management was conducted by social scientists and by multi-disciplinary and inter-disciplinary teams focused on "hazards" and "disasters" more than "emergency management." Leading research centers include the Disaster Research Center (DRC), formed at Ohio State and later moved to the University of Delaware, and the Natural Hazards Center (NHC) at the University of Colorado at Boulder. Another influential center has been the Hazard Reduction and Recovery Center (HHRC) at Texas A&M University. Other research centers focused on emergency management and related issues include the following:

- Center for Infrastructure Protection, George Mason University
- Community and Regional Resilience Institute (CARRI) and the Southeast Region Research Initiative
- Florida International University International Hurricane Center
- George Washington University Institute for Crisis, Disaster, and Risk Management
- Institute for Civil Infrastructure Systems, New York University (ICIS)
- International Center for Enterprise Preparedness (INTERCEP)
- Louisiana State University Hurricane Center
- Mid-America Earthquake Center
- University of Memphis Center for Earthquake Research and Information
- University of North Texas, Emergency Administration and Planning Program (EADP)
- University of South Carolina, Hazards and Vulnerability Research Institute (HVRI)

Until recently, most "emergency managers" entered the field with education and/or experience in law enforcement, the military, public administration, or other fields. However, "emergency management"

has emerged in recent years as a separate field of study and as a profession. The number of institutions of higher education programs offering emergency management programs has increased dramatically, including several programs that offer doctorates. For more information about research and education focused on "emergency management," an excellent place to begin is the FEMA Higher Education website. (Links are also included in Figure 4).

Professional development among emergency managers is also supported by ongoing training at the state and local levels and by FEMA's Emergency Management Institute (EMI). The EMI offers an extensive array of courses on their campus at Emittsburg, Maryland, as well as many online courses though their Independent Study Program (ISP). Many of these offerings, especially the online courses are available to all stakeholders.

THE TRANSPORTATION SYSTEM IN THE UNITED STATES

As a prelude to the profiles for the other two stakeholder groups (public agencies responsible for transportation and private companies in the freight transportation business) this section describes the U.S. transportation system—within which those stakeholders operate and for which those two groups share responsibilities.

Policy makers and transportation professionals sometimes refer to the "national transportation system," but the thing they are referring to does not fit most definitions of "system." It is actually a set of separate components owned and operated by a jumble of federal, state, and local governments, special purpose authorities, and a myriad of private companies—not to mention the transportation workforce and the contractors, manufacturers of vehicle and equipment, suppliers, warehousers, and others who provide essential resources. The money to pay for the "system" comes from an equally jumbled number of sources including fuel taxes, vehicle registration fees, general-purpose taxes, highway tolls, airline ticket taxes, private sector loans and investments, and the fees paid by shippers, passengers, and other customers.

From a freight perspective, any single shipment will likely be moved by a combination of modes using multiple segments of infrastructure, with many of those segments built, maintained, and/or operated by different public and private entities. The arrangements for transporation may have been made by parties other than the shipper, receiver, or transporter. Different stages of the movement are probably regulated by different public agencies. If something goes wrong along the way, another set of public agencies will respond, and the capabilities of the first responders will depend on the jurisdiction(s) within which the incident occurs.

So how do we describe the "transportation system" and its component parts? The fixed infrastructure is an essential part of the system, and many descriptions of the system focus on the infrastructure, sometimes referred to as the "network." For instance, the *National Transportation Recovery Strategy* from the U.S. Department of Transportation begins with this description:

> The U.S. transportation network includes more than 360 seaports, 26,000 miles of navigable water channels, approximately 4 million miles of roads and highways, more than 140,000 miles of freight rail, about 4,450 miles of commuter rail, around 168,000 miles of bus lines, more than 5,200 public-use airports, and well over a million miles of gas and oil pipeline. (USDOT 2009)

Table 9 is another example focused on the fixed "network." This is from the *Pocket Guide to Transportation, 2009,* published by the Bureau of Transportation Statistics, US DOT. Link. A final example that describes the system primarily in terms of fixed infrastructure is from the Tennessee Department of Transportation's website, shown as Figure 7.

Table 9. The Transportation Network: 2006

Mode	Components	
Highway (2005)		
Public roads	46,871 miles of Interstate highway	
	115,502 miles of other National Highway System roads	
	3,849,259 miles of other roads	
Air		
Public-use airports	5,233 airports	
Airports serving large certificated carriers (enplaned passengers)	26 large hub areas (67 airports), 487 million passengers	
	37 medium hub areas (62 airports), 141 million passengers	
	67 small hub areas (83 airports), 53 million passengers	
	924 nonhub areas (959 airports), 23 million passengers	
Rail (2005)		
Miles of railroad operated	95,664 miles by Class I freight railroads in the United States plus	
	1,368 miles within the U.S. owned by Canadian railroads	
	15,388 miles by regional freight railroads	
	29,197 miles by local freight railroads	
	23,000 miles by Amtrak (745 miles of trackage it owns)	
Urban transit (2005)		
Directional route-miles (not including contracted service)	Bus: 168,639	Heavy rail: 1,601
	Trolley bus: 429	Light rail: 1,091
	Commuter rail: 4,450	
Stations	Commuter rail: 1,164	Light rail: 730
	Heavy rail: 1,042	
Water (2005)		
Navigable channels:	26,000 miles	
Ferry routes:	639 directional route-miles	
Commercial waterway facilities		
Great Lakes:	600 deep-draft	
	154 shallow-draft	
Inland:	2,321 shallow-draft	
Ocean:	4,398 deep-draft	
	Ocean: 1,926 shallow-draft	
	Locks: 257	
Pipeline(2005)		
Miles of oil pipe	Crude lines: 60,043	
	Product lines: 71,310	
Miles of gas pipe	Transmission: 296,400	
	Distribution: 1,117,800	

Source: *Pocket Guide to Transportation, 2009,* Bureau of Transportation Statistics, USDOT Link

Tennessee's Transportation System

Highway System

- Bridges: 19,500, more than most southern states. 8,150 state owned bridges, 11,419 locally owned bridges
- Interstate miles: 1,104
- 19 interstate rest areas
- 13 interstate welcome centers
- 9 truck weigh stations
- State highway miles: 14,150
- Total highway miles: 87,000

Airport System

- 74 General Aviation
- 6 commercial
- 126 heliports

Rail System

- 20 short line railroads on 836 miles of rail
- 6 major rail lines on 2,098 miles of rail

Transit System

- 24 transit systems serving all 95 Tennessee counties

Waterways

- 1,062 miles of main channel miles of navigable waterways

Bicycle/Pedestrian System

- 231 miles of greenways, sidewalks and trails
- 9 bicycle trails on 1,500 miles including a single across state trail totaling 500 miles

Funding

- On each gallon of gas, Tennessee motorists pay 21.4 cents of state gas tax and 18.4 cents of federal gas tax. Funds are dedication for the Tennessee transportation system.

Key Programs

- The TDOT HELP program was launched in 1999 to help clear interstates of congestion by removing obstacles including vehicles from the travel lanes, thereby reducing traffic impact. Since that time, millions of motorists have been assisted and impacts to traffic have been reduced.
- TDOT SmartWay is the state's intelligent transportation system deployed in all four urban areas. The full complement includes a system of cameras, dynamic messaging and a transportation management center to monitor traffic and assist in reducing congestion on urban interstates. Completed systems are located in Nashville, Knoxville and Memphis and a basic system in Chattanooga.
- A TDOT SmartWay rural system is located in seven rural counties in east Tennessee including cameras to monitor the Rockwood Mountain section of I-40 in Roane County.

Figure 7. Description of Tennessee's Transportation System from the Tennessee Department of Transportation Website
http://www.tdot.state.tn.us/transportationsystem.htm (September 15, 2009)

However, the fixed infrastructure or the "network," is only part of the transportation system. Another critical component is described in Table 10—the numbers of powered vehicles, aircraft, and other conveyances that are used to move people and goods.

Table 10. Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances, 2005

Air	
Air carrier	8,225
General aviation (active fleet)	224,352
Highway, total (registered vehicles)	**247,421,120**
Passenger car	136,568,083
Motorcycle	6,227,146
Other 2-axle 4-tire vehicle	95,336,839
Truck, single-unit 2-axle 6-tire or more	6,395,240
Truck, combination	2,086,759
Bus	807,053
Transit	
Motor bus (also included under highways above)	82,027
Light rail cars	1,645
Heavy rail cars	11,110
Trolley bus	615
Commuter rail cars and locomotives	6,392
Demand response	41,958
Other (e.g., aerial tramway, cable car, ferry boat, inclined plane)	7,080
Rail	
Class I, Freight cars	474,839
Class I, Locomotive	22,779
Nonclass I freight cars	120,195
Car companies and shippers freight cars	717,211
Amtrak, Passenger train car	1,186
Amtrak, Locomotive	258
Water	
Nonself-propelled vessels (e.g., barges)	32,052
Self-propelled vessels	8,976
Oceangoing steam and motor ships (1,000 gross tons and over)	357
Recreational boats	12,942,414

Source: *National Transportation Statistics,* Bureau of Transportation Statistics, USDOT Link

Table 11 is yet another way of viewing the transportation system. It combines the fixed infrastructure with the vehicles, equipment, terminals, and other support facilities and focuses on the ownership of the components of the system and the respective sources of funding for capital investments and operations.

Figure 7 is the first page of a more extensive classification system for the transportation system that is especially relevant for this paper. This is from the *National Asset Database Transportation Taxonomy Quick Reference,* an appendix to the *Transportation Systems, Critical Infrastructure and Key Resources Sector-Specific Plan as input to the National Infrastructure Protection Plan,* published by the U.S. Department of Homeland Security in May 2007. A copy of the complete report, including the "transportation taxonomy"[2] is available online. An updated, online version of the entire infrastructure taxonomy is available online but requires a password.

The taxonomy provides a broader view of the transportation system than the previous examples. In addition to fixed infrastructure, vehicles and other conveyances, the taxonomy includes specialized equipment, terminals, navigation devices, traffic control, dispatch and operations centers, even a category of "Regulatory, Oversight, and Industry Organizations."

[2] The taxonomy was created not to describe the system but to promote clarity in communication about the system between the Department of Homeland Security and other organizations regarding the National Infrastructure Protection Plan (NIPP) and related issues.

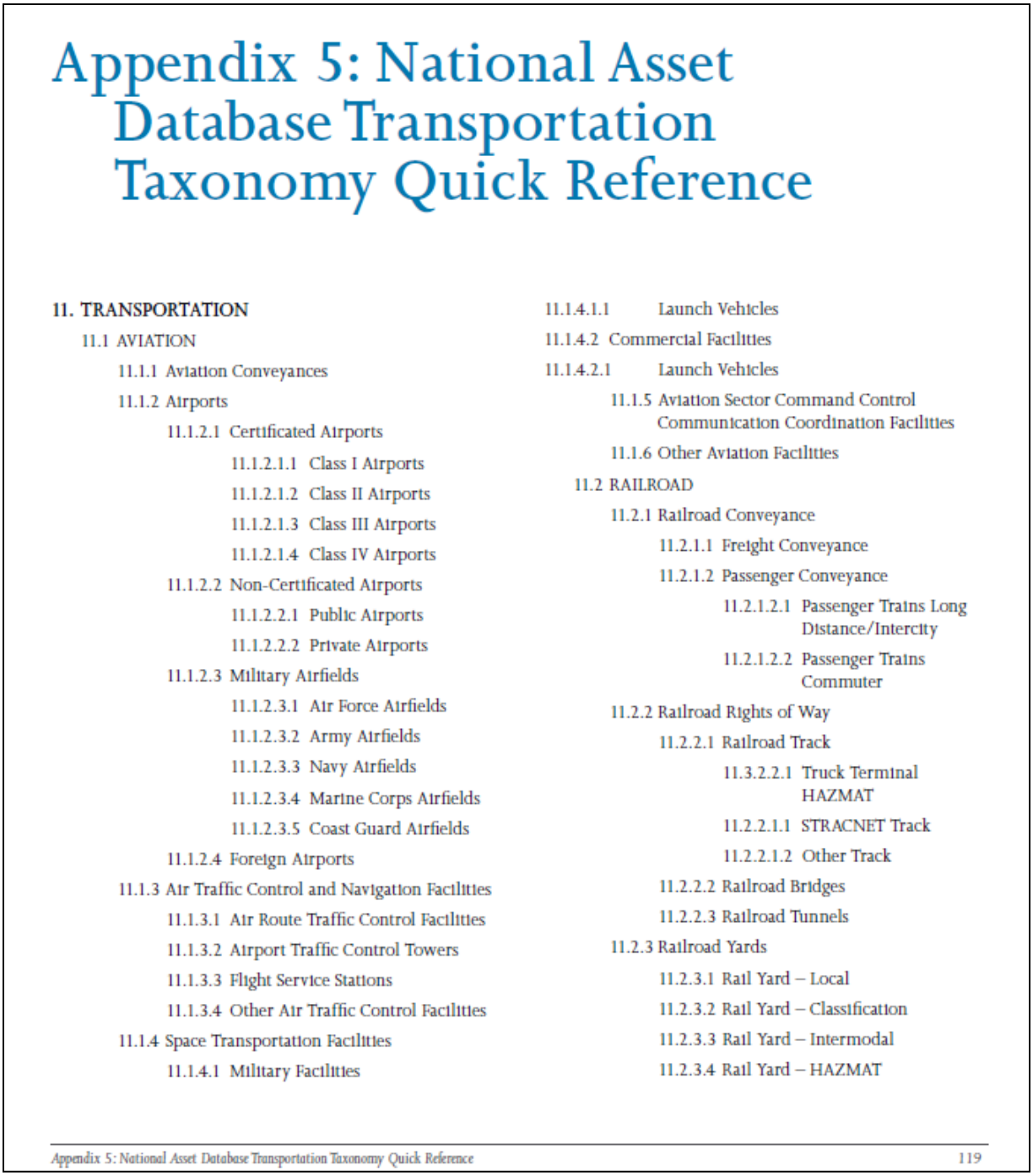
Table 11: Components of the Transportation Infrastructure for Movement of Freight: Owners and Sources of Funding

Component	Typical Owner	Primary Source of Capital Funds	Primary Source of Operating Funds
Interstate highways and National Highway System (NHS)	State DOT	Federal government*	State government*
Other federal-aid highways	State DOT or local government	Federal government*	State or local government*
State and local streets and roads and structures	State DOT or local government	State or local government*	State or local government*
Major highway bridges and tunnels	State DOT or authority	Federal government*	State government or authority*
ITS, highway traffic management centers, traffic signal systems	State DOT or local government	Federal government*	State or local government*
Highway trucking systems, truck fleets, and terminals	Private	Private financing/customers	Customers
Truck stops, repair, and service centers	Private	Private financing/customers	Customers
Freight railroads, rolling stock, rail yards, and intermodal terminals	Private	Private financing/customers	Customers
Major railroad bridges and tunnels	Private	Private financing/customers	Customers
Railroad communication, train control and signaling systems	Private	Private financing/customers	Customers
Oil and gas pipelines and related facilities	Private	Private financing/customers	Customers
Deep-draft seaports, Great Lakes, inland, and intracostal ports	Authority	Revenue bonds; federal, state, and local governments	Users and tenants**

Component	Typical Owner	Primary Source of Capital Funds	Primary Source of Operating Funds
Marine terminals, equipment, and port intermodal facilities	Private	Private	Private
Marine vessels, containers, barges, and equipment	Private	Private	Private
Inland and intercostal waterways	Federal government	Federal government	Federal
Waterway locks and dams	Federal government	Federal government	Federal
Air carrier airports	Authority	Revenue bonds; federal, state and local governments; users	Users and tenants**
General aviation airports	Local government or authority	Federal, state, and local governments	Users and tenants**, local government
Air navigation and traffic control system	Federal government	Federal government*	Federal government*
Airfreight and package express systems, terminals, and hubs	Private	Private	Private
Passenger and cargo aircraft	Private	Private	Private

* Largely from dedicated fuel taxes, vehicle registration fees, and other user taxes and fees

** Primarily from use fees, leases, and other tenant fees



Appendix 5: National Asset Database Transportation Taxonomy Quick Reference

11. TRANSPORTATION
- 11.1 AVIATION
  - 11.1.1 Aviation Conveyances
  - 11.1.2 Airports
    - 11.1.2.1 Certificated Airports
      - 11.1.2.1.1 Class I Airports
      - 11.1.2.1.2 Class II Airports
      - 11.1.2.1.3 Class III Airports
      - 11.1.2.1.4 Class IV Airports
    - 11.1.2.2 Non-Certificated Airports
      - 11.1.2.2.1 Public Airports
      - 11.1.2.2.2 Private Airports
    - 11.1.2.3 Military Airfields
      - 11.1.2.3.1 Air Force Airfields
      - 11.1.2.3.2 Army Airfields
      - 11.1.2.3.3 Navy Airfields
      - 11.1.2.3.4 Marine Corps Airfields
      - 11.1.2.3.5 Coast Guard Airfields
    - 11.1.2.4 Foreign Airports
  - 11.1.3 Air Traffic Control and Navigation Facilities
    - 11.1.3.1 Air Route Traffic Control Facilities
    - 11.1.3.2 Airport Traffic Control Towers
    - 11.1.3.3 Flight Service Stations
    - 11.1.3.4 Other Air Traffic Control Facilities
  - 11.1.4 Space Transportation Facilities
    - 11.1.4.1 Military Facilities
      - 11.1.4.1.1 Launch Vehicles
    - 11.1.4.2 Commercial Facilities
      - 11.1.4.2.1 Launch Vehicles
    - 11.1.5 Aviation Sector Command Control Communication Coordination Facilities
    - 11.1.6 Other Aviation Facilities
- 11.2 RAILROAD
  - 11.2.1 Railroad Conveyance
    - 11.2.1.1 Freight Conveyance
    - 11.2.1.2 Passenger Conveyance
      - 11.2.1.2.1 Passenger Trains Long Distance/Intercity
      - 11.2.1.2.2 Passenger Trains Commuter
  - 11.2.2 Railroad Rights of Way
    - 11.2.2.1 Railroad Track
      - 11.3.2.2.1 Truck Terminal HAZMAT
      - 11.2.2.1.1 STRACNET Track
      - 11.2.2.1.2 Other Track
    - 11.2.2.2 Railroad Bridges
    - 11.2.2.3 Railroad Tunnels
  - 11.2.3 Railroad Yards
    - 11.2.3.1 Rail Yard – Local
    - 11.2.3.2 Rail Yard – Classification
    - 11.2.3.3 Rail Yard – Intermodal
    - 11.2.3.4 Rail Yard – HAZMAT

Figure 7. Excerpt from the *National Asset Database Transportation Taxonomy Quick Reference*

An even broader perspective may be helpful in understanding transportation problems and opportunities relative to emergency management. In the textbook, *Introduction to Transportation Systems*, Joseph Sussman points out that transportation is "multi-dimensional," and he describes the physical components of the transportation system from internal and external perspectives. Internally, the physical components of transportation include:

- Infrastructure (guideways, terminals, and stations)
- Vehicles
- Equipment
- Power systems
- Fuel
- Control, communication, and location systems (Sussman 2000)

The last three components in the list (power systems; fuel; and control, communication systems) are often taken for granted. During emergencies, however, problems with power systems, availability or price of fuel, or the control, communication and tracking systems can be as disabling to the transportation system as direct damage to infrastructure, vehicles, or equipment.

Sussman also explains that the transportation system includes more than the physical components. He includes the "operators" (e.g. labor and management), and he addresses various aspects of operations that are fundamental to the system. These include schedules, allocation of human resources, flow distribution (e.g., peak versus off-peak), connection patterns (e.g., hub-and-spoke), tradeoffs between cost and level-of-service, and, specifically, contingency planning. In an emergency, even if the physical components of the transportation system are relatively undamaged, stresses on human resources or operational disruptions can render the system ineffective.

Figure 8 illustrates the *external* components of the transportation system as viewed by Sussman. The center of this diagram encompasses all of the "internal" components of the system as described above.

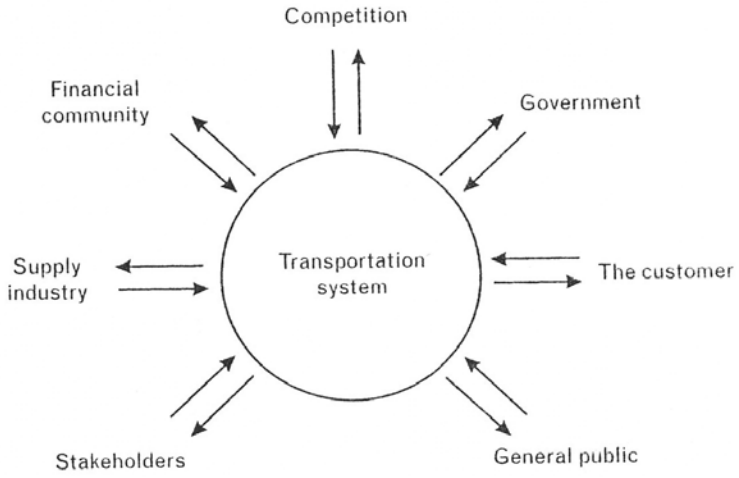


Figure 8. External Components of the Transportation System[3] (Sussman 2000)

Another view of the transportation system, more exclusively from the private sector perspective, is that transportation is part of the "supply chain." Most definitions use the "chain" analogy in reference to

[3] Sussman uses "stakeholder" to describe environmental groups, users of land adjacent to transportation facilities, and others "that may not be users of transportation or explicit suppliers . . . but are vitally concerned with transportation enterprises and their operating and investment practices."

linked processes and relationships rather than the physical infrastructure. According to Michael Hugos in *Essentials of Supply Chain Management,* the term "supply chain management" arose "in the late 1980s and came into widespread use in the 1990s. Prior to that time, businesses used terms such as 'logistics' and 'operations management.'" (Hugos 2003)

Hugos also offers definitions from three other sources:

- A supply chain is the alignment of firms that bring products or services to market. (Lambert, 1998)
- A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves . . . (Chopra 2003)
- A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. (Ganeshan 1995)

A RAND Corporation report describes it this way:

> A *supply chain* is the system of suppliers, shippers, transportation links, vehicles, warehouses, distribution centers, management processes, and information that connects manufacturers and retailers and that connects suppliers to manufacturers. The freight transportation system is a crucial component of most supply chains. (Hillestad 2009)

Responsibilities for the "freight transportation system" are divided among public agencies and private businesses, and those agencies and businesses are described in the following sections of the paper.

PUBLIC AGENCIES RESPONSIBLE FOR TRANSPORTATION

No single public agency has complete responsibility for transportation at any level of government. At least not to the extent that "emergency management agencies" are responsible for "emergency management" within their jurisdiction.

Many different public agencies *share* responsibilities for *aspects* or *components* of transportation. Some are responsible only for planning, coordination, and setting priorities for funding. Others are responsible for building and maintaining infrastructure. Some of these public agencies focus on specific modes of transportation. Others have multi-modal responsibilities. Some have more narrow responsibilities ranging from enforcing laws and regulations, to administering grants and other forms of financial assistance, to sponsoring research, training, and other types of technical support. Others focus on safety for a particular mode of transportation, while others have multi-modal safety responsibilities. Some of the federal and state agencies administer grants or loans to private companies as well as to public agencies at lower levels of government.

The public agencies most important for freight transportation at the federal, state, and local levels are described below. Since this paper is focused on freight transportation, the following does not give much attention to public transit agencies or the public transit units found within the federal and state DOTs. However, it should be noted that public transit has a significant role in emergency management, especially with regard to emergency evacuation and providing essential mobility for community and economic recovery. In addition, significant investments have been made to improve security for transit systems and their passengers, and much of the research and experience from the transit industry is transferable to the other modes of transportation.

Federal Transportation Agencies

At the federal level, the U.S. Department of Transportation (USDOT) has broad responsibility for certain aspects of all modes of transportation. However, the range of responsibilities is different for each mode, and many of the USDOT's functions involve shared responsibilities with state and local governments and the private sector. In addition, other federal agencies also have important responsibilities related to transportation, including the U.S. Army Corps of Engineers, U.S. Coast Guard, the Transportation Security Administration, the National Transportation Safety Board, Surface Transportation Board, and, in the IFTA region, the Tennessee Valley Authority. Also, the Bureau of Land Management (BLM) in the Department of the Interior and the Forest Service in the Department of Agriculture (USDA) have responsibilities for roads on public land. (Two of the agencies listed above, the Coast Guard and the Transportation Security Administration, were transferred from the Department of Transportation to the Department of Homeland Security in 2003.)

The USDOT was established in 1967 by combining already existing programs and offices from other federal agencies, including the previously independent Federal Aviation Agency, the Bureau of Public Roads (from the Department of Commerce), and the Coast Guard (from the Treasury Department). The current organization of the USDOT is shown in Figure 9.

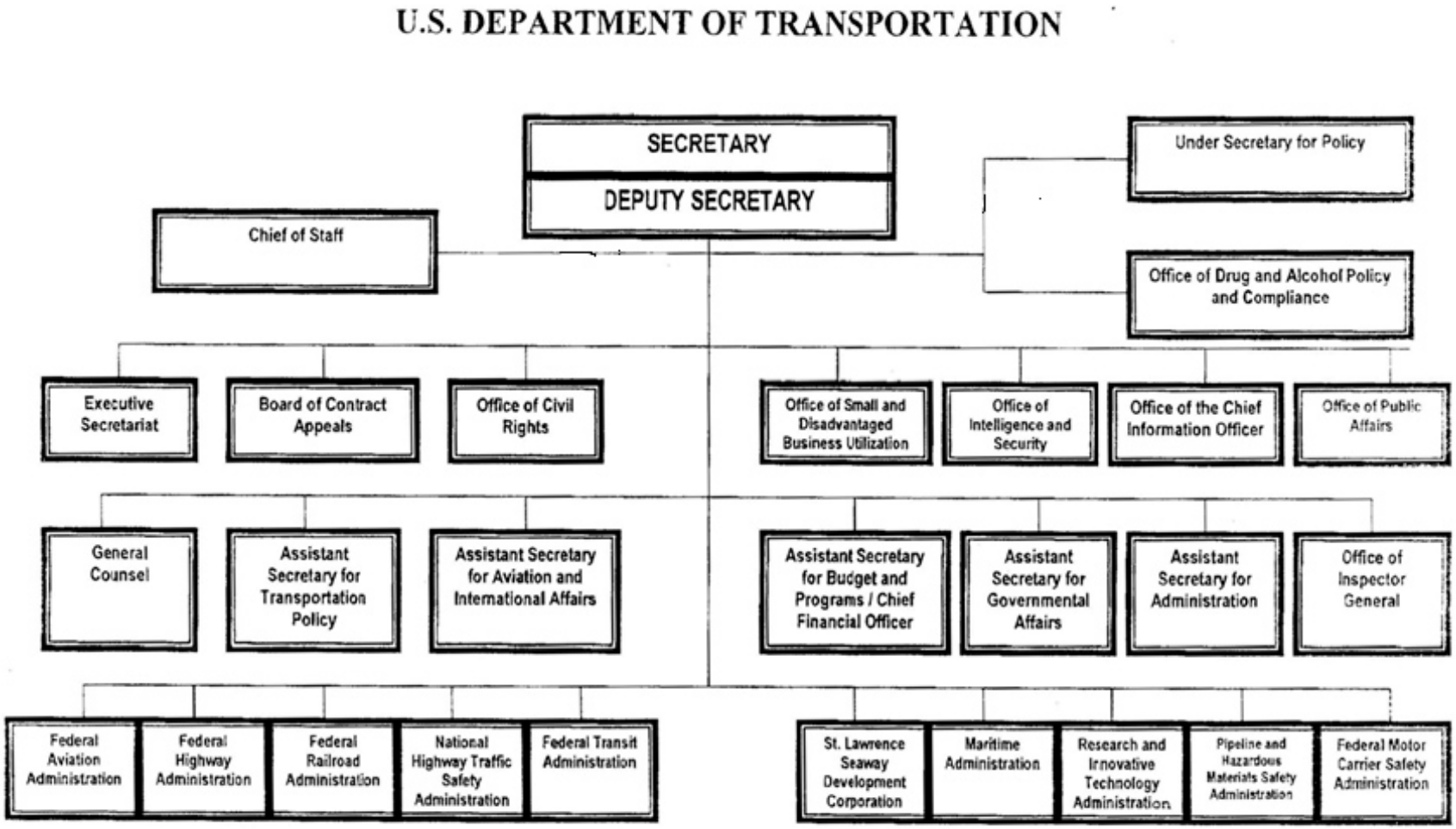


Figure 9. U.S. Department of Transportation Organizational Chart

In addition to the Office of the Secretary and a number of staff and policy offices reporting to the Secretary, the current organization of the USDOT includes ten "modal administrations":

- Federal Aviation Administration
- Federal Highway Administration
- Federal Motor Carrier Safety Administration
- Federal Railroad Administration
- Federal Transit Administration
- Maritime Administration
- National Highway Traffic Safety Administration
- Pipeline and Hazardous Materials Safety Administration
- Research and Innovative Technology Administration
- Saint Lawrence Seaway Development Corporation

Also, the Surface Transportation Board (STB) is housed within the USDOT. The STB is an independent body that is responsible for economic regulation of interstate surface transportation, primarily railroads.

Table 12 shows the number of full-time equivalent employees in the USDOT. The Federal Aviation Administration (FAA) accounts for more than 80% of the total. The vast majority of these FAA employees are involved in operation of the nation's air traffic control, operation and maintenance of air navigation systems, and aviation safety. The Federal Highway Administration (FHWA) has the next largest number of employees, followed by the Federal Motor Carrier Safety Administration (FMCSA).

Table 12. Full Time Equivalent Employment, U.S. Department of Transportation, FY 2009

Administration	FY 2009
Federal Aviation Administration	46,983
Federal Highway Administration	2,814
National Highway Traffic Safety Administration	635
Federal Motor Carrier Safety Administration	1,119
Federal Transit Administration	526
Federal Railroad Administration	869
Pipeline and Hazardous Materials Safety Admin	428
Saint Lawrence Seaway Development Corporation	157
Surface Transportation Board	150
Maritime Administration	789
Research and Innovative Technology Admin	706
Working Capital Fund	219
Inspector General	419
Office of the Secretary	562
Total Full Time Equivalent Employment	56,376

Source: U.S. Department of Transportation, *Fiscal Year 2010 Budget Highlights,* May 2009

The types of responsibilities and programs vary within each of the "modal administrations," as do the levels of resources (human and financial), but each of the ten, except for the Federal Transit Administration, has at least some direct responsibilities related to freight transportation. Many of the administrations have field offices that bring them into day-to-day contact with state and local officials and with transportation businesses.

The **Federal Highway Administration** (FHWA) and the **Federal Motors Carrier Safety Administration** (FMCSA) have separate, staffed "Division Offices" in every state. Contact information for the FHWA Division Offices in Tennessee and the eight adjacent states is available through the following links:

Tennessee	Arkansas	Kentucky	Missouri	Virginia
Alabama	Georgia	Mississippi	North Carolina	

The Federal Motors Carrier Safety Administration (FMCSA) contact information for their region and state offices is available from their website. Link

The **Federal Aviation Administration** (FAA) has staff at all major airports and at other air traffic control facilities. In addition, FAA has numerous field offices to carry out missions other than air traffic control. The service areas for each field office are different depending on functions. For instance, the Memphis Airports District Office (ADO) serves all of Tennessee and Kentucky. On the other hand, the Memphis Flight Standards District Office (FSDO) serves only West Tennessee, while the Nashville FSDO serves Middle and East Tennessee. The Louisville FSDO serves all of Kentucky.

Contact information for FAA offices (other than air traffic control) can be found though the following links:

- Aircraft Certification Offices (ACO)
- Airports Regional Offices
- Flight Standards District Offices (FSDO)
- Manufacturing & Inspection District Offices (MIDO)
- Aircraft Evaluation Groups (AEG)
- International Field Offices and Units (IFO) (IFU)
- Certificate Management Offices (CMO)
- Regional Offices
- Security and Hazardous Materials Offices
- Mike Monroney Aeronautical Center
- William J. Hughes Technical Center

The **Federal Railroad Administration** (FRA) has eight regional offices (e.g., the Region 3 office serves Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee), and rail safety inspectors who work in all of the IFTI states. According to their website, FRA has 400 federal safety inspectors nationwide. The disciplines for the inspectors are Hazardous Materials, Motive Power and Equipment, Operating Practices, Signal and Train Control, and Track Structures.

Additionally, FRA's field personnel include program managers for highway-rail grade crossing and trespass prevention, bridge structure specialists, and industrial hygienists. The Office of Railroad Safety also trains and certifies state safety inspectors, currently about 170 in 30 States, to enforce Federal rail-safety regulations. This is an unusual program with state employees enforcing federal regulations. FRA pays for only the direct costs related to training.

Information about the other modal administration of the USDOT is available from the websites identified on the previous page. Information about some of the other federal agencies with transportation-related responsibilities is available from the following links: U.S. Army Corps of Engineers, U.S. Coast Guard, the Transportation Security Administration, the National Transportation Safety Board, Surface Transportation Board, and, in the IFTI region, the Tennessee Valley Authority.

State Transportation Agencies

The departments of transportation in each state have the primary responsibility for highways within their respective states and a varying range of responsibilities for other modes of transportation. Prior to the late 1960s most of these state agencies were known as the "department of highways." Following the lead of the federal government, most of the states have now created "departments of transportation."

In most cases these new state transportation agencies retained all of the responsibilities and functions of the former highway agencies, and most absorbed some responsibilities and functions related to other modes of transportation. However, the states' roles in those other modes was generally more limited than in highways; and, in most state DOTs, most of the resources of the department of transportation are still focused on highways.

The following excerpts from *Alternative Organizational Processes in State Departments of Transportation* help describe the range of involvement of state DOTs in aspects of transportation beyond just highway planning, design, construction, maintenance, and operation:

> Today, state DOTs vary in the nature and breadth of their activities and functions (and, of course, organizational design). For example, some—but not all, and in some cases, only a few—state DOTs perform the following specific functions in addition to the "basic" highway function:
>
> • **Aviation.** Most states (41) have aviation departments and most of those functions have been folded into the state DOT. Some state DOTs own and operate commercial and/or general aviation airports, and some have aircraft for DOT and/or other state agency usage.
>
> • **Bicycle, Pedestrian, and Trails.** All state DOTs have identified bicycle, pedestrian, and/or trails program coordinators . . . They are housed in a wide variety of DOT organizational units. It appears that only one—the NC DOT—has a full-fledged division (with about 10 employees) that addresses bicycle and pedestrian issues, exclusively.
>
> • **Economic Development.** At least two DOTs**,** i.e., the Louisiana Department of Transportation and Development *and* the Alaska Department of Transportation & Public Facilities, house specific economic development functions.
>
> • **Ferry Operations**. Some states—approximately six to eight—operate extensive ferry systems (North Carolina, Alaska, and Washington being prominent) as an extension of the highway system.

• **Highway Patrol (State Police).** Highway patrol agencies are sometimes part of a state DOT, often as a component of the DMV. In other cases, the patrol is independent of the DOT, and in others, it is an independent agency altogether.

• **Inland Waterways.** Between one-third and one-half of state DOTs have an identified inland water transportation function, including the Great Lakes states. These functions are predominantly planning assistance, promotion, and/or coordination roles.

• **Intercity Rail.** At least 40 state DOTs have a rail transportation program, including commuter (passenger) rail and/or intercity passenger and freight rail. . . . with some providing funding for rolling stock and/or facilities; some operating rail vehicles; some leasing rail trackage . . . .

• **Local Aid.** Many state DOTs have "local aid" (or similarly-functioning) programs that provide technical and/or financial assistance to counties and/or municipalities for the reconstruction and maintenance of local highway and street systems.

• **Local System Roadways.** Traditional county/municipal highway and street systems are most often left to the counties and municipalities, although in a few states such as North Carolina, Virginia, Missouri, and West Virginia, parts or all of these local systems are handled by the state DOT, significantly increasing the centerline mileage under state jurisdiction.

• **Motor Carriers.** Truck (mostly safety) regulation is handled by some state DOTs, sometimes as a function of the DMV operation and sometimes separately, such as a Commercial Vehicle Enforcement Division.

• **Motor Vehicle Administration.** Motor vehicle and driver regulation ("DMV") is part of the state DOT in about half the states.

• **Ports (Seaports).** In some states, the port authority is entirely independent of the state DOT; in others, it has a "dotted line" relationship; and in others, it is contained in another state agency, such as the Department of Commerce.

• **Tollways.** In some states, tollways (bridges, tunnels, and highway segments) are constructed, operated, and maintained by the state DOT. In others, tollways are handled by independent authorities. In some states, for example, Texas, Florida, and Virginia, both models appear simultaneously.

• **Transit.** Most state DOTs now contain some transit programs, but they vary widely, from intercity rail, to commuter rail, to bus systems, both rural and urban. Also, the DOTs vary widely in the scope of transit activities, some providing only planning and pass-through of federal monies, and others actually operating systems.

So, it is clear that there are great similarities—especially in the highway design, construction, maintenance, rehabilitation, and operation areas—and there are great differences among state DOTs in terms of the expanse of functions and the way they are structured to carry them out. (Cameron 2009)

The organizational structures of state DOTs reflect many of the program variations described above. One fundamental difference among DOTs is that some are departments of state government with department heads (e.g., secretaries, commissioners) appointed by and reporting directly to their respective governors. Other DOTs, however, report to boards or commissions established under state constitutions or legislative acts. In the nine states used as examples in this report, five have boards or

commissions—Georgia, Mississippi, Missouri, North Carolina, Virginia. These boards or commissions have varying degrees of autonomy and decision making authority. The three members of the Mississippi Transportation Commission are elected from three geographic areas of the state. The board members in the other states are appointed by their respective governors.

Regardless of the differences, all of the state DOTs plan, design, build, maintain, and operate the major highway systems within each state and, collectively, the national highway system. Even the Interstate and other "national" or "U.S." highways are built and maintained by the states within their respective jurisdictions. Significant federal funding flows to the states through the Federal Highway Administration, along with federal standards and guidelines to ensure that interstate travelers enjoy a seamless, national highway network. Each state DOT, however, has considerable discretion with the federally-funded highway programs in their respective states.

It should be noted, however, that not all highways fall under the jurisdiction of the state DOT. In fact, most roads in the U.S. are owned by the cities and counties.[4] On a route miles basis (ignoring the number of lanes), "state highways" account for less than 20% of the total U.S. mileage. The differences narrow, however, when looking at "lanes miles" as opposed to "route miles," and especially when looking at vehicles miles traveled. The high-volume, multi-lane highways, almost all of which are "state" highways, account for the vast majority of vehicle miles of travel in every state.

Nonetheless, the ownership of the relatively low-volume roadways is important from an emergency management perspective. State DOTs may be able to respond with personnel and equipment from outside the area impacted by a particular event, but they must have the authority and established procedures to work on "off system" (i.e., non-state) roads as well as the state routes.

State DOTs have another "off-system" responsibility that is important for emergency management. Under the National Bridge Inspection Standards (NBIS) program, the states are responsible for inspection and associated record keeping on all publicly owned highway bridges greater than 20 feet in length. The state can delegate certain responsibilities to local agencies, and some states use private contractors for bridge inspections. Regardless, for emergencies involving known or suspected damage to bridges, the state DOTs have trained personnel and special equipment for bridge inspections, needed records, and knowledge of local and private resources for damage assessment and development of "next step" plans.

Other state DOT functions that are especially important for emergency management involve the maintenance and operation of the state highway system. Most state DOTs have significant assets for highway maintenance—personnel, vehicles, and heavy equipment—dispersed at multiple locations. The

[4] Each state has its own policies for differentiating "state" and "local" roads and for the associated fiscal responsibilities. Kentucky, Missouri, North Carolina, Virginia, and Missouri are responsible for relatively high percentages of the total road mileage in their respective states. See FHWA website for data on all states.

DOT can often respond to emergencies from nearby but relatively unaffected locations. The Tennessee DOT, for instance, has four "regions," and more than two-thirds of the department's total work force is assigned to one of the regions. The region personnel are dispersed among offices at the region, district, and county levels.

When an emergency occurs, responders from these field offices usually have practical skills, expertise, and equipment as well as local knowledge to help ensure effective response. Also, the state DOTs usually have their own systems for two-way radio communication, sometimes on-site fuel storage, and ability to use emergency contracts for services and supplies.

For evacuations, the DOTs have traffic control devices, signs, and equipment to help support detours, crossovers, and related activities. They may also have control over traffic signals, at least at major intersections.

Many DOTs are taking advantage of technology to implement "intelligent transportation systems (ITS)." These ITS systems include state-of-the-art traffic management centers with CCTV camera surveillance of roadways and key intersections and information from various sensors that monitor traffic flow over a wide area. The TMCs can deliver messages to travelers through overhead message boards, highway advisory radios, 511 systems, and customized information using electronic communications. Many of the TMCs also serve as dispatch centers for "freeway service patrols" to assist with the management of highway incidents, from routine breakdowns to multi-vehicle crashes and other events that threaten public health and safety.

Some DOTs have collocated their TMCs with emergency communication centers and/or law enforcement or other public safety dispatch facilities. In Houston, the Harris County Emergency Operations Center (EOC) and the TxDOT Traffic Management Center (TMC) are located in the same facility. The Georgia EOC and the Georgia "Navigator" TMC are located on the same campus. A USDOT sponsored study in 2006 describes other coordination initiatives between EOCs and TMCs. Link

The one aspect of freight transportation that is almost totally outside the realm of state DOTs is the movement of oil, natural gas, and other materials by pipelines. Most DOTs have little involvement beyond coordinating when a pipeline crosses or closely parallels a state highway. Pipeline safety at the state level generally resides in the state "public service" or "public utility" commission.

Before moving to the local and regional levels, Table 14 displays the organizational mission statements for the DOTs in Tennessee and the eight adjacent states. The statements in Table 14 were taken from each department's website, and presumably indicate the way the organization views itself and wants to be viewed by external stakeholders.

Table 14. Mission Statements:
State Departments of Transportation in Tennessee and the Eight Adjoining States

Tennessee Link	The mission of the Tennessee Department of Transportation is to plan, implement, maintain, and manage an integrated transportation system for the movement of people and products, with emphasis on quality, safety, efficiency, and the environment.
Alabama Link	To provide a safe, efficient, environmentally sound intermodal transportation system for all users, especially the taxpayers of Alabama. To also facilitate economic and social development and prosperity through the efficient movement of people and goods and to facilitate intermodal connections within Alabama. ALDOT must also demand excellence in transportation and be involved in promoting adequate funding to promote and maintain Alabama's transportation infrastructure.
Arkansas Link	It is our mission to provide and maintain a safe, effective and environmentally sound transportation system for the state.
Georgia Link	The Georgia Department of Transportation provides a safe, seamless and sustainable transportation system that supports Georgia's economy and is sensitive to its citizens and environment.
Kentucky Link	To provide a safe, efficient, environmentally sound and fiscally responsible transportation system that delivers economic opportunity and enhances the quality of life in Kentucky.
Mississippi Link	The Mississippi Department of Transportation is responsible for providing a safe intermodal transportation network that is planned, designed, constructed, and maintained in an effective, cost-efficient and environmentally-sensitive manner.
Missouri Link	Our mission is to provide a world-class transportation experience that delights our customers and promotes a prosperous Missouri.
North Carolina Link	Mission: Connecting people and places in North Carolina - safely and efficiently, with accountability and environmental sensitivity.
Virginia Link	Our mission is to plan, deliver, operate and maintain a transportation system that is safe, enables easy movement of people and goods, enhances the economy and improves our quality of life.

Comparing the statements does not point to any fundamental differences among the agencies. Some general observations about similarities:

- Most of the nine DOTs define their mission in terms of providing a "transportation system," and none of the DOTs mention highways or any other specific mode
- Most refer to safety as a priority
- Most refer to efficiency as a priority
- Most refer to environmental sensitivity as a priority

- Several refer to the movement of “people and goods” or “people and products,” and two use the term “intermodal”
- Four refer to the role of transportation in supporting the economy or prosperity
- Only one refers to “customers”
- None mention private sector partners
- None mention other federal, state, or local agency partners
- None mention security, emergency management, resilience, continuity or any similar words related to emergency managment

Local Public Works and Engineering Departments

These are the departments of city and county governments that are responsible for irreplaceable parts of the highway system from a freight perspective—the first (and last) few miles necessary for trucks to move goods and products between their origins and destinations. In most urban areas, the director of the public works and/or engineering reports directly to the mayor or county executive or to the city or county manager. The department usually has responsibilities for other infrastructure and services (e.g., water and sewer, stormwater, waste management, recycling, reviewing subdivision plans) in addition to basic street and road responsibilities. In rural areas, the head of the county road department may be elected to that position; but, regardless, the department is focused on basic roadway and bridge maintenance, resurfacing, drainage, and occasional new construction.

Table 15 identifies the department of city government responsible for streets and roads in the state capitals of Tennessee and the eight adjacent states. Based on a review of the websites for these governments, the “department of public works” has most or all of the responsibilities for local streets and roads, with two exceptions. In Montgomery, three different departments have responsibilities related to streets and roads—Engineering Environmental Services, Maintenance, and Traffic Engineering. The City of Jefferson City has a Department of Community Development, and according to their website the department “is divided into four services (Code Enforcement, Public Works, Planning and Transportation, Wastewater), each of which are composed of divisions.” (See Figure 10.)

Table 16 describes the similar internal organizations for the public works departments in Little Rock, Jackson (MS), and Nashville. All three departments have responsibilities for roads—“Operations” in Little Rock, “Infrastructure Management” in Jackson, and “Street Services.” All three have responsibilities for waste management, and all three have engineering sections. Little Rock and Nashville have separate sections for traffic engineering. The public works department in Little Rock has responsibility for building maintenance. The department in Jackson has responsibility for vehicle maintenance.

Table 15. Department(s) of Local Government Responsible for Streets and Roads

State	Capital City	Department(s)
Tennessee	Nashville	Public Works
Alabama	Montgomery	Engineering and Environmental Services, Maintenance, Traffic Engineering
Arkansas	Little Rock	Public Works
Georgia	Atlanta	Public Works
Kentucky	Frankfort	Public Works
Mississippi	Jackson	Public Works
Missouri	Jefferson City	Community Development
North Carolina	Raleigh	Public Works
Virginia	Richmond	Public Works

Sources: Each city's website

Code Enforcement Animal Protection and Control Building Regulations Environmental Health	Public Works Engineering Parking Stormwater Streets
Planning and Transportation Airport Transit CAMPO (Capital Area Metropolitan Planning Organization) Current Planning	Wastewater

Figure 10. Services Provided by the Department of Community Development, Jefferson City (Missouri) Link

Table 16. Organizational Units in Selected Local Department of Public Works

Little Rock, Arkansas	Jackson, Mississippi	Metropolitan Nashville-Davidson County, Tennessee
– Administration o Parking Enforcement – Operations – Civil Engineering – Solid Waste Services – Traffic Engineering – Building Services	– Facility Management – Solid Waste – Infrastructure Management – Engineering – Water / Sewer – Vehicle Maintenance	– Administration & Finance – Engineering – Street Services – Beautification and Environment Commission – Traffic & Parking – Waste Management

Sources: Each department's website

Transportation Authorities

Transportation services are sometimes delivered by an independent public agency known as an "authority" which is legally separate from general purpose state or local governments. Usually these authorities are created by one or more cities and/or counties acting under state enabling legislation. In other cases, specific authorities are created by state legislation. Examples include airport authorities, port authorities, public transit authorities, and tollway authorities.

Transportation authorities, usually governed by appointed boards of directors, have jurisdiction over specific facilities or modes of transportation. Many authorities have the power to acquire and own property, but most cannot enact property taxes or other forms of broad taxation. Most rely heavily on revenues from users in the form of leases, transaction fees, parking fees, and other fees for service. Some are allowed to borrow money directly for capital improvements by pledging future revenues. Others have to rely on their respective cities, counties, or state government to incur long-term debt.

Some of the airports in the IFTI area fall under the jurisdiction of airport authorities, including Memphis International Airport (Memphis and Shelby County Airport Authority) and Louisville International Airport (Louisville Regional Airport Authority. However, the Hartsfield-Jackson Atlanta International Airport is under the direct jurisdiction of the Aviation Department of the City of Atlanta.

In Tennessee, most of the air carrier airports and some of the general aviation airports are under the jurisdiction of airport authorities, created by joint action of one or more local governments. Similarly, a number of Tennessee cities and counties have joined together under state enabling legislation to create authorities that have preserved rail service along multi-county corridors. Tennessee statutes also provide for the creation of marine port authorities. The range of responsibilities of an independent authority is sometimes limited in enabling legislation; and the general-purpose government(s) that creates an authority usually can specify additional limits when creating the authority.

Transportation Boards and Commissions

State and local governments also have the option of creating boards or commissions to facilitate coordination among multiple units of government, manage unique resources, provide advice and oversight, or perform regulatory functions. These are not separate entities, but are empowered to take specific actions on behalf of the general purpose government(s). Examples include the Memphis and Shelby County Port Commission, Nashville's Traffic and Parking Commission, and many local and regional planning commissions. The Arkansas Waterways Commission has significant powers and duties related to waterway development in Arkansas, including the power to acquire land. The Tennessee Aeronautics Commission is an advisory board that makes recommendations on state funding of airport grants and must approve the state airport systems plan.

Metropolitan Planning Organizations (MPOs)

Metropolitan Planning Organizations (MPOs) are required by federal regulations as a prerequisite for use of funds administered by the Federal Highway Administration and the Federal Transit

Administration. The federal regulations do not specify any specific legal arrangement for the MPO (e.g., independent agency, authority, board, commission, committee). Rather, a "decision making body" has to be designated by the respective Governor to carry out a prescribed transportation planning process. The regulations apply to all urban areas with a core urbanized population of 50,000 or more. The planning area must include the currently urbanized area plus all geographic areas likely to become urbanized with the next 20 years.

The regulations specify factors that must be considered in planning as well as criteria for public involvement and consultation with interested parties. MPOs must produce and adopt certain documents, including a Long Range Transportation Plan and a Transportation Improvement Program (TIP) that lists specific projects to be funded for each of the next three years. Projects not included in the approved TIP are not eligible for federal transportation funding.

MPO's are organized in different ways, but most have an executive board made up of elected and other policy-level officials. Various committees are established to address technical and operational matters and make recommendations to the executive board. Some MPOs are separate entities set up under state law or enabling legislation while others are based on cooperative agreements among the member governments. Some have full-time staff to support the MPO process while others rely on staff assigned by one or more of the member governments. Virtually all utilize the special expertise of professionals within the respective local governments, other regional agencies, and the state DOT(s).

To illustrate, the Memphis Urban Area Metropolitan Planning Organization (MPO) encompasses two counties in Tennessee and one in Mississippi. (West Memphis, Arkansas has a separate MPO.) The Memphis MPO was formed by mutual agreement of the participating governments, and the MPO is staffed by the Memphis and Shelby County Division of Planning and Development. The Policy Board consists of approximately 20 elected officials, including the Governors of Tennessee and Mississippi, city and county elected officials, the board chairpersons of the Memphis Area Transit Authority, the Memphis-Shelby County Airport Authority, and the Memphis and Shelby County Port Commission, and the heads of the Tennessee and Mississippi departments of transportation. (MSCDPD 2009)

Tennessee has eleven MPOs, and the eight adjacent states have a total of 77 (not double counting where the MPOS boundaries include areas in more than one state). Table 17 provides links to the website for one selected MPO in each of the nine states. These were selected from the among the MPOs that have web sites, including a range of population sizes and excluding cities already used as examples in previous sections.

Consultants and Contractors

The public agencies responsible for transportation rely heavily on architects, engineers, planners and other professional consultants for planning and design of transportation facilities. The public agencies also rely heavily on the private sector to build and sometimes even to maintain and operate transportation facilities.

Table 17. Metropolitan Planning Organizations for Selected Urban Areas

State	Urbanized Area	Metropolitan Planning Organization
Tennessee	Jackson	Jackson Area Metropolitan Planning Organization Link
Alabama	Birmingham	Birmingham Metropolitan Planning Organization Link
Arkansas	Fort Smith	Bi-State Metropolitan Planning Organization Link
Georgia	Gainesville	Gainesville-Hall Metropolitan Planning Organization Link
Kentucky	Lexington	Lexington Area MPO Link
Mississippi	Combined*	Gulf Coast Regional Planning Commission Link
Missouri	St. Louis	East-West Gateway Council of Governments Link
North Carolina	Durham	Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Link
Virginia	Fredericksburg	Fredericksburg Area Metropolitan Planning Organization (FAMPO) Link

* The Gulf Regional Planning Commission (GRPC) serves as the combined MPO for the urbanized areas of Gulfport-Biloxi and Pascagoula-Moss Point

Airport, port, and rail authorities and many public works agencies have relatively small staffs and must turn to the private sector when a new facility or major addition needs to be planned and designed. Even state DOTs are increasingly using consultants for planning and design of bridges, roadways, traffic management systems, and other component of the transportation infrastructure.

Building and construction of transportation facilities is almost always accomplished by the private sector. Some firms specialize in transportation work. Public agencies, faced with pressures to reduce staff sizes and difficulties in recruiting and training qualified staff, are turning to private sector consultants to inspect and manage the work of private sector builders and construction contractors.

Collaboration, Research, and Professional Development

Public agencies responsible for transportation work together in the coordination of projects and services within their common jurisdictions and work jointly with chambers of commerce and other agencies to promote economic development. As noted above, transportation agencies in urbanized areas are required to work together as participants in the Metropolitan Planning Organization. Joint efforts among transportation agencies are common as part of economic development and other community initiatives. Agencies at different levels of government also interact through grant management, regulation, data collection and reporting, and technical support. Emergency management exercises, especially at the local level, often include representation from several transportation agencies. And, the public agencies responsible for transportation must sometimes compete for limited resources from their parent or member governments.

Transportation agencies and transportation professionals also interact through formal associations and as part of continuing education and other forms of professional development. Some of the associations include only organizational members, such as the American Association of State Highway and Transportation Officials (AASHTO), the National Association of State Aviation Officials (NASAO), and the Association of State Rail Safety Managers. Others focus on organizational members but have other membership categories for individuals and/or other organizations with related interests. Examples include the American Association of Port Authorities (AAPA), Association of Metropolitan Planning Organizations (AMPO), and Inland Rivers Ports and Terminals (IRPT).

Other organizations focus on the interests and needs of individuals in specific professions or occupations. Examples include: American Association of Airport Executives (AAAE), American Planning Association (APA), American Public Works Association (APWA), American Society of Civil Engineers (ASCE), American Society of Highway Engineers, and the Institute of Transportation Engineers (ITE). Of course, membership in these organizations is not limited to public sector employees, and private sector employees are frequently involved in many of these organizations.

Other sources available to provide information, technical assistance, and freight-related guidance for public agencies include ITS America, the Eno Transportation Foundation, the National Traffic Incident Management Coalition, and the FHWA-funded Local and Tribal Transportation Assistance Program to assist smaller communities and rural areas. See the National LTAP/TTAP for state contacts.

Elected official also work on transportation issues through associations such as the Council of State Governments, National Association of Counties, National Conference of State Legislators, National Governors Association, National League of Cities, and the United States Conference of Mayors. Most of these organizations have committees and working groups that focus on specific topics, including transportation and emergency management.

As noted previously, public agencies responsible for transportation depend heavily on consultants, builders, and heavy construction companies. Thus, those private sector firms have vested interest in public policies, and often work through trade associations to influence and better understand governmental actions. Examples of such associations include the American Council of Engineering Companies, American Institute of Architects, American Road & Transportation Builders Association (ARTBA), and the Associated General Contractors of America (AGC) . These organizations also have chapters or affiliated associations in most states.

Several accreditation programs are available to transportation professionals and organizations. The Institute of Transportation Engineers sponsors a program that certifies transportation professionals, including the Professional Traffic Operations Engineer® (PTOE) and the Professional Transportation Planner® (PTP). Professional planners, without regard to specialization, can be certified as members of the American Institute of Certified Planners (AICP).

Each of the states regulates the practice of engineering and requires that certain engineering activities, primarily engineering design, can only be performed by a licensed professional engineer (P.E.). The

National Council of Examiners for Engineering and Surveying (NCEES) assist the states by developing and scoring the exams that are part of the licensing requirements.

The American Public Works Association (APWA) offers a voluntary accreditation program, based on the *Public Works Management Practices Manual*. According to the APWA web site , a total of seventeen local government agencies have been certified in the nine states used as examples in this report: six in Virginia, five in Missouri, three in Mississippi, two in Georgia, and one in Kentucky. The seventeen on the list are described as the "department of public works," except the "Public Works and Transportation Departments" in the County of Prince William (Virginia) and the "Department of Transportation and Environmental Services" in Alexandria, Virginia.

From a research perspective, the transportation community has a unique asset—the Transportation Research Board (TRB), a division of the National Research Council which is a private, nonprofit institution that is "the principal operating agency of the National Academies in providing services to the government, the public, and the scientific and engineering communities." Although not a public agency, the TRB receives most of its financial support from state and federal agencies. The TRB manages a number of programs and services related to transportation research, and the TRB website provides access to numerous resources.

One important feature of TRB is that practitioners are actively involved in virtually every aspect of research. For the "Cooperative Research Programs," for instance, practitioners are instrumental in selecting and prioritizing topics, designing the scopes of work, selecting researchers, and reviewing and disseminating results. The procedures are virtually the same for the National Cooperative Highway Research Program (NCHRP), the Airport Cooperative Research Program (ACRP), the Hazardous Materials Cooperative Research Program (HMCRP) and the National Cooperative Freight Research Program (NCFRP).

The TRB acted promptly after 9/11 to address the threats of terrorism against the nation's transportation system and the system users. According to a TRB update on December 1, 2009:

> Since September 11, 2001, 110 security-, emergency management-, and infrastructure protection-related projects have been authorized in the Cooperative Research Programs: 85 of these projects have been completed; 7 projects are in progress; and 18 projects have contracts pending or are currently in development.

Information on TRB and other National Academies security-related products and links is available online, along with a frequently updated slide presentation on all of the hazards and security-related activities.

Transportation research, whether funded by TRB, state DOTs, or other sources, is carried out by universities, academic and other non-profit research centers, National Laboratories, and consultants and other private organizations. The following is a representative but not exhaustive list of research centers that have done work of interest to public agencies responsible for freight transportation, in addition to the University of Memphis, Intermodal Freight Transportation Institute (IFTI) and the Vanderbilt Center for Transportation Research (VECTOR):

- Center for Infrastructure Protection, George Mason University
- Center for Transportation Research, UT Knoxville
- Center for Transportation Studies (CTS) at the University of Minnesota
- Intermodal Transportation Institute (ITI) at the University of Denver and the National Center for Intermodal Transportation
- Iowa State University Institute for Transportation and the Midwest Transportation Consortium
- Mack-Blackwell Rural Transportation Center (MBTC)
- National Center for Freight & Infrastructure Research & Education (CFIRE), University of Wisconsin-Madison
- National Transportation Research Center (NTRC)
- TTI, Multimodal Freight Transportation
- University of New Orleans Transportation Center and Other Research Centers at the University of New Orleans
- University of Toledo Intermodal Transportation Institute
- Upper Great Plains Transportation Institute (UGPTI)

Continuing professional development for transportation professionals is available through many of the professional organizations described above as well as universities and private sources. Most of the licensing and certification programs require continuing education.

Several programs are designed to help public officials become more effective in dealing with freight transportation issues. One examples is the FHWA "Talking Freight" seminar series. Another is the I-95 Coalition's Freight Academy, described as a "unique immersion program designed to efficiently train public sector agency staff whose planning, operational, and/or management work impact goods movement decisions, investments, and interactions." The National Highway Institute (NHI) offers two courses that focus on freight.

FREIGHT TRANSPORTATION BUSINESSES

The "freight transportation business" is so extensive and diverse that it is difficult to describe with all-encompassing "group" characteristics. In the 1970s, while the NGA was formulating the ideas for "comprehensive emergency management" and before FEMA existed, the U.S. transportation industry was described in terms of competing modes and high levels of economic regulation. Most services were provided by a relatively small number of relatively large companies, many of them in financial difficulty.

Today, the modal distinctions are often less important than the intermodal connections and the integration of modes, technologies, and different business models. Economic regulation is minimal, and shippers pay competitive rates for movement of virtually every commodity and product.[5] The numbers of transportation companies have grown substantially, and those companies range in size from independent owner-operators to multi-billion dollar corporations serving national and international customers.

Most of the smallest businesses providing freight transportation services are trucking companies. The American Trucking Associations (ATA) reports that 97 percent of all trucking companies have 20 or fewer trucks. (ATRI 2009) Many of the local and regional railroads are also operated by small businesses with relatively small numbers of employees. Other small businesses provide transportation support services, supplies, equipment, and consulting services.

The other end of the spectrum includes a number of companies in the U.S. "Fortune 500," including United Parcel Service, FedEx, the four largest railroads (CSX, Norfolk Southern, Union Pacific and Burlington Northern Santa Fe), and YRC Worldwide (a trucking and logistics company formed in part by combining the Yellow, Roadway Express, and Reimer truck lines). The list also includes two companies that describe themselves as "third-party logistics" companies (C.H Robinson and Expeditors International), Ryder System, and ten companies that operate pipelines and related energy businesses. (Fortune 2009)

Freight transportation businesses are described on the following pages under five categories: airfreight, trucking, railroads, waterways, pipelines, and transportation management and logistics. However, many of these companies, large and small, describe themselves in terms of multiple modes and services that are operated under an array of business models and corporate structures. The five categories are used here to group the companies with others that provide similar services, but the distinctions are inexact and, as noted in the text, many distinctions can be made within the five categories.

To further address the difficulties of categorizing transportation businesses, Table 18 shows selected "codes" from the North American Industry Classification System (NAICS). The U.S. government (Bureau of the Census) in collaboration with Canada and Mexico developed this system for statistical purposes,

[5] For an overview of transportation deregulation in the U.S., a paper titled *Regulation: From Economic Deregulation to Safety Regulation* is available on the FHWA website at http://ops.fhwa.dot.gov/freight/theme_papers/final_thm8_v4.htm.

but it is widely used for "various administrative, regulatory, contracting, taxation, and other non-statistical purposes." (U.S. Census Bureau 2009) For instance, the Small Business Administration (SBA) uses these codes in their methodology to define "small business" by category. For instance, a small business under "Water Transportation" has fewer than 500 employees; under "Truck Transportation" a small business has gross receipts under $25.5 million. Under "Pipeline Transportation" the SBA criteria are different for "Pipeline Transportation of Crude Oil" (1,500 employees) and "Pipeline Transportation of Natural Gas" ($7.0 million). (SBA 2008)

The codes selected for inclusion in Table 18 are from the NAICS "48-49" series and the "541614" category. For the purposes of this paper, these are the companies in the "freight transportation business." However, many companies provide combinations of the services shown in Table 18. In addition, many of the companies in the freight transportation business are also in other businesses *not included* in Table 18. FedEx, for instance, entered the printing business (NAICS codes 323114 and 323115) by acquiring Kinko's. UPS is also in the office supply (NAICS 453210) and banking businesses (NAICS 522110 and other codes). American Commercial Lines provides inland waterway transportation, but is also in the shipbuilding and repair business (NAICS 336611). C.H Robinson provides "freight transportation arrangement," but is also a wholesaler of fresh fruits and vegetables (NAICS 424480).

Table 18. Selected North American Industry Classification System (NAICS) Codes to Describe the Freight Transportation Business

48 Transportation and Warehousing	**488 Support Activities for Transportation**
481 Air Transportation	**4881 Support Activities for Air Transportation**
4811 Scheduled Air Transportation	48811 Airport Operations
48111 Scheduled Air Transportation	488111 Air Traffic Control
481111 Scheduled Passenger Air Transportation	488119 Other Airport Operations
481112 Scheduled Freight Air Transportation	48819 Other Support Activities for Air Transportation
4812 Nonscheduled Air Transportation	488190 Other Support Activities for Air Transportation
48121 Nonscheduled Air Transportation	**4882 Support Activities for Rail Transportation**
481212 Nonscheduled Chartered Freight Air Transportation	48821 Support Activities for Rail Transportation
481219 Other Nonscheduled Air Transportation	488210 Support Activities for Rail Transportation
482 Rail Transportation	**4883 Support Activities for Water Transportation**
4821 Rail Transportation	48831 Port and Harbor Operations
48211 Rail Transportation	488310 Port and Harbor Operations
482111 Line-Haul Railroads	48832 Marine Cargo Handling
482112 Short Line Railroads	488320 Marine Cargo Handling
483 Water Transportation	48833 Navigational Services to Shipping
4831 Deep Sea, Coastal, and Great Lakes Water Transportation	488330 Navigational Services to Shipping
48311 Deep Sea, Coastal, and Great Lakes Water Transportation	48839 Other Support Activities for Water Transportation
483111 Deep Sea Freight Transportation	488390 Other Support Activities for Water Transportation
483113 Coastal and Great Lakes Freight Transportation	**4884 Support Activities for Road Transportation**
4832 Inland Water Transportation	48841 Motor Vehicle Towing
48321 Inland Water Transportation	488410 Motor Vehicle Towing
483211 Inland Water Freight Transportation	48849 Other Support Activities for Road Transportation
484 Truck Transportation	488490 Other Support Activities for Road Transportation

4841 General Freight Trucking	**4885 Freight Transportation Arrangement**
48411 General Freight Trucking, Local	48851 Freight Transportation Arrangement
484110 General Freight Trucking, Local	488510 Freight Transportation Arrangement
48412 General Freight Trucking, Long-Distance	**4889 Other Support Activities for Transportation**
484121 General Freight Trucking, Long-Distance, Truckload	48899 Other Support Activities for Transportation
484122 General Freight Trucking, Long-Distance, Less Than Truckload	488991 Packing and Crating
4842 Specialized Freight Trucking	488999 All Other Support Activities for Transportation
48421 Used Household and Office Goods Moving	**491 Postal Service**
484210 Used Household and Office Goods Moving	**4911 Postal Service**
48422 Specialized Freight (except Used Goods) Trucking, Local	49111 Postal Service
484220 Specialized Freight (except Used Goods) Trucking, Local	491110 Postal Service
48423 Specialized Freight (except Used) Trucking, Long-Distance	**492 Couriers and Messengers**
484230 Specialized Freight (except Used) Trucking, Long-Distance	**4921 Couriers and Express Delivery Services**
486 Pipeline Transportation	49211 Couriers and Express Delivery Services
4861 Pipeline Transportation of Crude Oil	492110 Couriers and Express Delivery Services
48611 Pipeline Transportation of Crude Oil	**4922 Local Messengers and Local Delivery**
486110 Pipeline Transportation of Crude Oil	49221 Local Messengers and Local Delivery
4862 Pipeline Transportation of Natural Gas	492210 Local Messengers and Local Delivery
48621 Pipeline Transportation of Natural Gas	
486210 Pipeline Transportation of Natural Gas	**54 Professional, Scientific, and Technical Services**
4869 Other Pipeline Transportation	**541 Professional, Scientific, and Technical Services**
48691 Pipeline Transportation of Refined Petroleum Products	**5416 Management, Scientific, and Technical Consulting Services**
486910 Pipeline Transportation of Refined Petroleum Products	541614 Process, Physical Distribution, and Logistics Consulting Services
48699 All Other Pipeline Transportation	
486990 All Other Pipeline Transportation	

Source: *North American Industry Classification System (NAICS)*, U.S. Census Bureau http://www.census.gov/eos/www/naics/ (December 1, 2009

The NAICS 48-49 categories that cover passenger transportation are not included in Table 18, except scheduled passenger air transportation since commercial airlines regularly carry freight and passengers on the same aircraft. The Warehousing and Storage ("493" series) is also excluded, although warehouses are often integrated in the supply chain. In spite of the emphasis on "just in time" deliveries, warehousing is still critical in many circumstances.

Airfreight

The movement of freight by aircraft is dominated by two very large companies—FedEx and UPS. However, neither of these corporations describes themselves as an "airfreight" company. The two are sometimes referred to in the business journals as "integrators," meaning that FedEx and UPS offer integrated service with all of the components necessary to move express packages from origin to destination and to be able to track each package in transit. Both companies also operate trucking services (other than just their express delivery vehicles) as well as other logistics and related businesses. Their trucking businesses are discussed in the following section. As already noted, "FedEx Office" was formerly Kinko's, and UPS operates "The UPS Store" and "Mail Boxes Etc." as well as UPS Capital.

FedEx describes itself as a "worldwide network of companies," and describes FedEx Express, the business unit that uses aircraft, as "the world's largest express transportation company, providing fast and reliable delivery to every U.S. address and to more than 220 countries and territories." FedEx Express operates more than 650 aircraft (including Airbus A300 and A310s, 727-200s, and MD 10s and 11s) and more than 43,000 "motorized delivery vehicles." FedEx Express serves more than 375 airports worldwide with six hubs in the U.S., including the "Super Hub" at Memphis International Airport. (FedEx 2009b)

UPS describes itself as the "the world's largest package delivery company and a leading global provider of specialized transportation and logistics services." The UPS Package Operations unit use more than 200 company-owned aircraft and approximately 300 chartered aircraft along with almost 100,000 "package cars, vans, tractors, and motorcycles, including 1,783 alternative-fuel vehicles." UPS serves approximately 400 U.S. airports and another 435 international airports. UPS operates eight U.S. hubs including their main U.S. air hub at the Louisville International Airport. (UPS 2009)

With FedEx at Memphis International Airport and UPS at Louisville International Airport, the IFTI area has two of the top five busiest U.S. airports based on tons of cargo. The other five are Anchorage (with significant transit freight), Los Angeles, and Miami. The Indianapolis International Airport, the site of FedEx's second largest hub, is in the top ten.

Statistics on the ton-miles of freight carried by U.S. airlines are available from the Bureau of Transportation Statistics. Link These statistics show that FedEx and UPS accounted for almost 50% of the national total for 2008. The other 50% was transported by the commercial passenger airlines and by companies that focus on air cargo services.

The commercial airlines that operate scheduled passenger service carry freight in their aircraft cargo bins ("bellies"). See for instance, American Airlines Cargo, Delta Cargo, and Southwest Cargo. For 2008, American Airlines reported cargo revenues of $874 million (about 4% of total revenues). (AMR Corporation 2009)

Table 19 lists a dozen examples of companies that specialize in air cargo services in the U.S. and/or link the U.S. with other countries. These are examples only and are not based on any ranking or systematic

selection process other than trying to include a range of companies in terms of size, areas served, and services provided. A few of these companies use large aircraft, but most use smaller aircraft to serve smaller communities and to provide special charter services for critical domestic cargo. Many of the smaller companies operate feeder services for UPS and FedEx, and some also offer passenger charter service. Several of the companies listed in the table also transport mail for the U.S. Postal Service (USPS).

Table 19. Examples of U.S. Companies Providing Airfreight Services (Other than FedEx and UPS)

– Air Cargo Carriers	– Capital Cargo International
– Air Transport International	– IBC Airways
– Alpine Air	– Kalitta Air
– Ameriflight	– Martinaire
– Atlas Air	– RAM Air Freight
– Arrow Cargo	– Wiggins Airways

Only two of these companies are publicly traded, but they represent the range of companies in the air cargo business. Alpine Air (Alpine Air Express, Inc.) operates routes in six western states and has two routes in Hawaii. Operating revenues in 2009 amounted to approximately $20 million, and about 80% of those revenues came from the USPS. Most of the balance came from services provided for UPS. (Alpine 2009)

Atlas Air (Atlas Air Worldwide Holdings) is the parent company of Atlas Air, Titan Aviation Leasing Limited, and the majority shareholder of Polar Air Cargo Worldwide, Inc. In 2008, operating revenues were approximately $1.6 billion. The company operates globally with a fleet of Boeing 747 freighters, offering a range of services for "airlines, express delivery providers, freight forwarders, the U.S. military and charter brokers." (Atlas 2009)

One other company that should be mentioned is DHL, which is a subsidiary of Germany's Deutsche Post and a global competitor of FedEx and UPS. In early 2009 DHL ceased all of its air and ground services within the US. However, DHL Express (USA) still offers international shipping services to and from the U.S.

A number of organizations and associations represent the interests of airfreight stakeholders and provide opportunities for professional interaction and continuing education. These organizations, which are also sources of current information about the industry, include:

- Airports Council International (ACI) – N. America
- Air Transport Association
- American Association of Airport Executives (AAAE)
- Cargo Airline Association
- International Air Transport Association (IATA)
- International Civil Aviation Organization
- National Air Transportation Association (NATA)
- National Business Aviation Association (NBAA)
- Regional Airline Association (RAA)
- Regional Air Cargo Carriers Association
- The International Air Cargo Association (TIACA)
- Cargo Network Services (IATA Subsidiary)

Airfreight operations are subject to most of the same safety and training regulations that apply to passenger operations, plus some freight-specific regulations. Federal Aviation Regulations (FARs) cover the safety of virtually every aspect of domestic aviation, including the granting of "airmen certificates." Not only must pilots meet certain requirements for "certification" or licensing so must mechanics and other personnel (flight engineers, navigators, dispatchers), and the company itself must be "certified" by demonstrating that it is "able to conduct business in a manner that complies with all applicable regulations and safety standards and . . . [can] manage the hazard-related risks in [the applicable] operating systems and environment." (FAA 2009) The FAA has an office that focuses specifically on the transportation of hazardous materials by air. Link

International airfreight services require compliance with numerous safety and import/export rules of the countries served, compliance with agreements between the U.S. and the respective country, and procedures established by organizations such as the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA).

Professional development and continuing education in the airfreight industry are accomplished through the organizations and associations described above, individual company programs, and universities and vocational schools. FAA and their counterparts in other countries are responsible for air traffic control and aircraft movements on the ground, but airports are managed locally. The American Association of Airport Executives (AAE) sponsors the Accredited Airport Executive (A.A.E.) program, with a number of prerequisites, multi-phase qualifications, and various study materials, courses and workshops to assist candidates. AAAE also offers a Certified Member (C.M.) program, and in 2003-2004 added certificate programs for airport personnel other than managers. The Airport Certified Employee (ACE) program provides a "thorough and up-to-date education in four disciplines: Airfield Operations, Airfield Lighting Maintenance, Security and Communications. Those who pass a written exam will achieve the distinguished ACE designation." (AAAE, 2009)

The Professional Aviation Maintenance Association (PAMA) and the SAE Institute have established a voluntary certification process for both FAA-certificated and non-certificated technicians. The Aviation Maintenance Specialist (AMS) and Aviation Maintenance Engineer (AME) designations are now available. The University Aviation Association lists 100 accredited colleges as members of the association. Links are provided below for four of the most widely known of those members:

- Embry-Riddle
- Middle Tennessee State University
- The Ohio State University
- University of North Dakota

Embry-Riddle has multiple campuses. The link provided is to the "Worldwide" site. Embry-Riddle also offers professional development and certificate programs. Continuing education is also offered through the aviation and airfreight organizations listed previously.

Trucking

The "trucking industry" might be better described as the "trucking industries" (plural). Trucking services can be divided and subdivided many different ways. Some trucks are operated on a "for-hire" basis while others are "private carriers" owned and operated by, for instance, a manufacturing company to meet that company's own transportation needs. Some trucks operate locally to distribute goods within a single market area. Others operate over long-distances to connect different markets. The types of trucks vary from delivery vans to "straight trucks" to large tractor-trailer rigs. The federal government has established certain standards for truck sizes and weights, but the states also have some discretion relative to vehicle sizes and weights.

Some companies provide TL (truckload) service with trailers dedicated to a single shipment. Others provide LTL (less than truckload) service, usually requiring that loads be consolidated at a terminal and then distributed from another terminal at the end of the line haul. Some companies offer both types of service and combinations or specialized arrangements for specific customers, products, or service areas.

The sizes of companies and ownership arrangements also vary. Many trucking companies are small businesses, including individual owner-operators who may have just one or two regular customers or may rely on a broker to find "loads." The owner-operator may own the truck or may be leasing it from a third party. The shipper, the trucking company, or another party may own the trailer. According to the Bureau of Labor Statistics, about 60 percent of the companies in "truck transportation and warehousing" employ fewer than five workers. Further, more than half of all jobs in that category of were in companies with fewer than 100 trucks. (Bureau of Labor Statistics 2009)

At the other end of the spectrum from the independent owner-operator is YRC Worldwide, formed in part by the combination of three companies that were each among the largest in the trucking business—Yellow Transportation, Roadway Express, and Reimer Express (formerly the largest common carrier in Canada). The *2008 Annual Report* (10-K) for YRC Worldwide includes the following characteristics for Yellow, Roadway and Reimer combined, operating primarily less-than-truckload services:

- More than 560,000 manufacturing, wholesale, retail and government customers
- 37,000 employees
- Approximately 430,000 shipments in transit at any time
- Approximately 14,300 owned tractors, 2,300 leased tractors, 59,700 owned trailers and 2,800 leased trailers
- 521 strategically located facilities with 24,763 doors
- Accounted for 70% of WRC Worldwide's total operating revenue in 2008 (YRC 2009)

YRC Worldwide also own three large regional trucking companies. Those companies, with a combined employment over 13,000, are described in the annual report as follows:

> The Regional Transportation companies serve more than 180,000 manufacturing, wholesale, retail and government customers throughout North America. At December 31, 2008, the . . .

network included 161 service centers with 7,637 doors, and the fleet included 7,933 tractors and 18,177 trailers. (YRC 2009)

Other divisions of YRC Worldwide include YRC Logistics, a "global logistics services provider that plans and coordinates the movement of goods worldwide," and Glen Moore, a truckload carrier, that provides "spot, dedicated and single-source customized truckload services on both a regional and national level through the use of company and team-based drivers." Glen Moore has two primary domiciles located in Carlisle, Pennsylvania, and Knoxville, Tennessee." (YRC 2009)

Between the individual owner-operators and YRC Worldwide are thousands of other for-hire and private carriers. According to the American Trucking Associations (ATA), there were 3.0 million large trucks on the road in the United States in 2006 and 5.3 million commercial trailers registered, with approximately 3.5 million truck drivers. There are over 290,000 for-hire carriers and more than 504,000 private carriers in the U.S. (ATA undated)

Table 20 lists ten of the largest for-hire U.S. trucking companies drawing from several sources that rank the companies in different ways. No attempt was made to reconcile the different rating systems, and this list is only representative of the largest companies. Two very large companies could have been added—Penske Truck Leasing and Ryder Systems. These two companies, primarily leasing companies, have a combined total of almost 115,000 tractors leased for trucking services, almost 100,000 trailers, and a fleet of more than 160,000 straight trucks and vans. (ATA 2009)

Table 20. Examples of Large Companies that Provide For-Hire Trucking Services

– Con-Way Transportation	– Swift Transportation
– FedEx Freight	– UPS Freight
– FedEx Ground	– U.S. Xpress
– J.B. Hunt Transport	– Werner Enterprises
– Schneider National, Inc.	– YRC Worldwide

Table 21 provides links to another dozen companies that are based in the IFTI area. Many of these are also large companies that operate nationwide, and some have subsidiary companies that provide specialized services. For instance, Covenant Transportation Group, which is headquartered in Chattanooga, is a publicly traded company that includes Covenant Transport, Southern Refrigerated Transportation, Star Transportation, and Covenant Transport Solutions.

Selecting any of the links from either table will reveal that these "trucking companies" offer a wide range of logistics services and varying arrangements to meet the needs of their customers. For instance, FedEx Freight provides LTL freight services through its FedEx Freight business (regional LTL freight services) and its FedEx National LTL business (long-haul LTL freight services). The FedEx Freight segment also includes FedEx Custom Critical, Inc., a time-specific, critical shipment carrier. FedEx Ground provides

day-certain service to businesses in the U.S. and Canada, as well as residential delivery to U.S. residences through FedEx Home Delivery. FedEx Ground also includes FedEx SmartPost, Inc., which specializes in the consolidation and delivery of high volumes of low-weight, less time-sensitive business-to-consumer packages using the USPS or Canada Post Corporation for final delivery. (FedEx 2009)

Table 21. Examples of Companies in the IFTI Area that Provide For-Hire Trucking Services

– Arkansas Best – Averitt Express – Covenant Transport – Forward Air – Maverick Transportation – Milan Express	– Miller Transporters – PAM Transportation Services – USA Truck – Western Express – Ozark Motor Lines – Builders Transportation

In addition to the for-hire trucking companies, many corporations operate their own fleets to serve their own transportation needs. These are referred to as "private carriers." A 2009 ranking of the "Top 100" private carriers identified companies ranging from Coca-Cola Enterprises (Atlanta) to the Carpenter Company (Richmond, Virginia). The Coca-Cola Enterprise fleet includes 7,900 tractors, 9,500 straight trucks and vans, and 10,000 trailers. The Carpenter fleet includes 238 tractors, 35 straight trucks, and 1,200 trailers. (ATA 2009)

Some of the other well known companies that operate private carrier fleets with at least 1,000 tractors include Sysco, Walmart, Pepsi Bottling Group, Tyson Foods, Dean Foods, Interstate Bakeries (Wonder Bread and Hostess), and Safeway. Memphis-based International Paper operated 965 tractors and 257 straight trucks. (ATA 2009)

A review of the membership list of the National Private Truck Council (NPTC), a trade association, found several other companies based in the IFTI area that operate private fleets did not make the "Top 100" list. These include Auto Zone, Bridgestone Americas, Dollar General Corporation, Land O'Frost, Orgill, and Tractor Supply Company.

A number of organizations and associations represent trucking interests and provide opportunities for professional interaction and continuing education. These organizations, which are also sources of current information about the industry, include:

- American Trucking Associations (ATA)
- American Trucking Associations-Intermodal Motor Carriers Conference
- National Association of Small Trucking Companies (NASTC)
- National Private Truck Council (NPTC)
- Owner-Operator Independent Drivers Association (OOIDA)
- Truckload Carriers Association
- National Association of Independent Truckers (NAIT)

Trucking associations have also been formed in most states. Examples include the Arkansas Trucking Association, the Tennessee Trucking Association, and the Mississippi Trucking Association.

Truck drivers and companies are subject to federal and state rules and regulations. Most aspects of transportation-specific federal regulation—for drivers, companies, brokers, and forwarders—fall under the jurisdiction of the Federal Motor Carrier Safety Administration (FMCSA). Enforcement of state trucking safety regulations usually fall under the jurisdiction of the state department of safety or a separate motor carrier safety enforcement unit. However, permits for over-dimensional or overweight shipments usually are handled by the respective state DOT.

Professional development and continuing education for drivers, other operating personnel, and managers are accomplished through individuals companies, trade and professional organizations, and public and private education and vocational schools. The National Private Truck Council sponsors the Certified Transportation Professional program (CTP®). The American Transportation Research Institute is a 501(c)(3) not-for-profit research organization and is part of the American Trucking Associations Federation.

Railroads

The U.S. railroad system is operated by seven very large companies (known as the Class 1 railroads), 33 regional railroads, 324 local lines, and 199 switching and terminal railroads.[6] Table 22 shows the total miles served by the railroads in each category.

Table 22. Number of Freight Railroads and Mileage in the United States

Type	Number of Freight Railroads	Miles of Line (Excluding Trackage Rights)	Miles of Line (Including Trackage Rights)
Class 1	7	94,313	119,098
Canadian	2	561	1,368
Regional	33	16,930	19,917
Local	324	22,298	24,039
Switching & Terminal	199	6,593	7,091
Total	565	140,695	171,513

Source: *Freight Railroads in United States,* 2007, American Association of Railroads Link

[6] The Association of American Railroads defines a "Class I" as a railroad with 2007 operating revenues of at least $359.6 million (based on Surface Transportation Board criteria). A "Regional" railroad provides line haul service on 350 or more miles of road and/or with revenues of at least $40 million. A "Local" railroad is neither a Class 1 nor a Regional and is engaged primarily in line-haul service. A "Switching & Terminal" railroad is a non-Class 1 engaged primarily in switching and/or terminal services.

Another term sometimes used is "shortline" or "short line." The definition is not as precise, but it generally refers to all of the "locals" and may refer also to some of the smaller "regionals" and larger "switching and terminal" lines.

Figure 11 is a map of rail lines in the U.S., and the map that helps highlight some important features. First, the seven Class 1 railroads— Burlington Northern Santa Fe (BNSF), Canadian National (CN) , Canadian Pacific (CP), CSX Transportation (CSX), Kansas City Southern (KCS), Norfolk Southern (NS), and the Union Pacific (UP)—account for approximately 70% of the U.S. rail mileage. Further, these seven companies account for more than 90% of total railroad revenues. The four largest U.S. Class 1 railroads (BNSF, CSX, NS, and the UP) are Fortune 500 companies.

The local and regional railroads act as collectors and feeders, moving traffic to and from the Class 1 railroads for the long-haul service. As shown in Figure 11, many communities are not served by any railroad, and very few communities are served by more than one of the Class 1s. If not directly served by a railroad, communities rely on trucking for connection to the national railroad system.

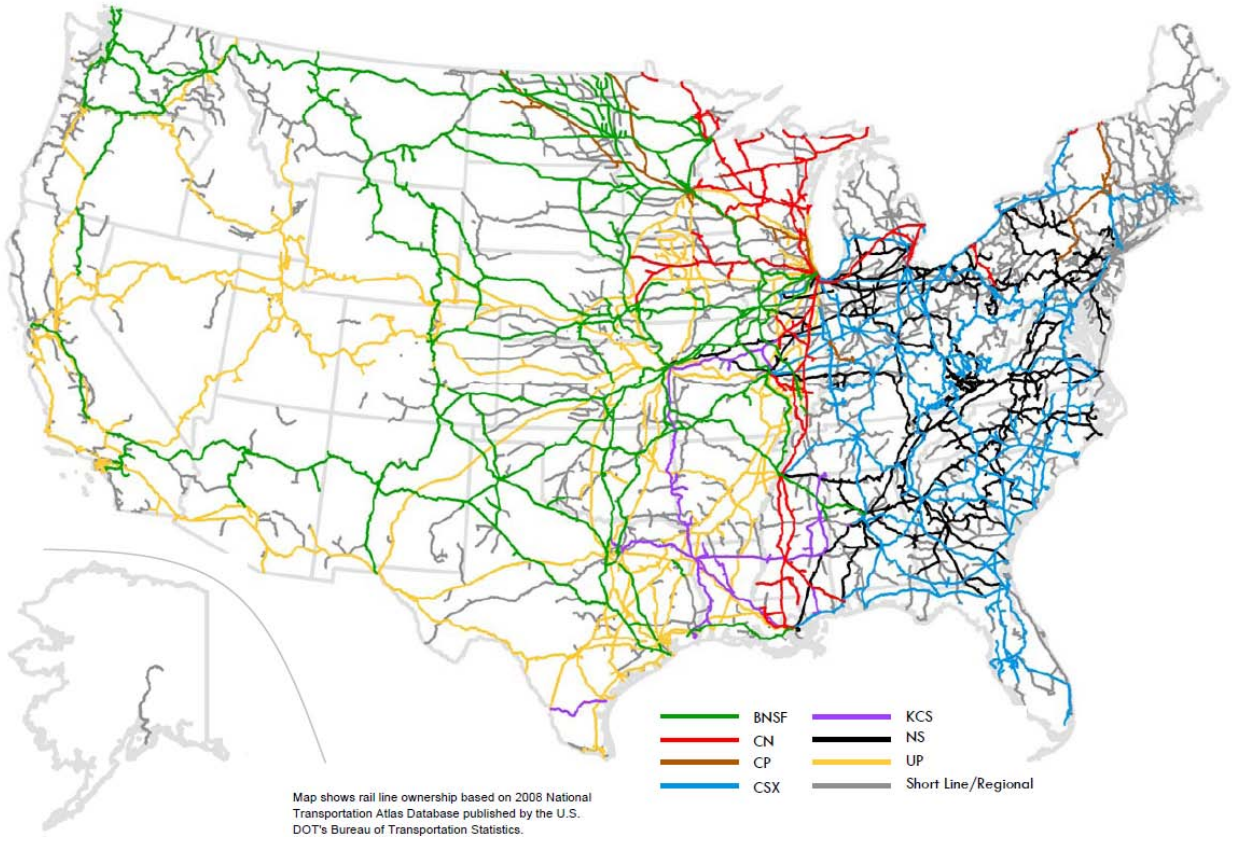


Figure11. Map of Railroads in the United States Link

Figure 11 also highlights that BNSF, UP, and the KCS operate primarily west of the Mississippi River. CSX and NS operate primarily east of the Mississippi. Thus, Memphis and St. Louis (along with Chicago and New Orleans) serve as critical gateways for links between the “western” and “eastern” railroads.

Finally, Figure 11 points to the unique network that the Canadian National has established, with their east- west routes in Canada funneling south through the Great Lakes area and the mid-west and

connecting with the Gulf Coast. CN has also made significant investments in Memphis as an intermodal hub for containers that arrive from Asia at the Port of Prince Rupert in Canada. Figure 12 is a map of the CN system that includes their intermodal terminals as well as connections with the KCS and Mexican railroads (Ferromex and Ferrosur). Figure 12 also shows the CN link with CG Railways for rail-ferry service between Mobile, Alabama, and Coatzacoalcos, Mexico.

Figure 12. Intermodal Terminals and Ports Served by the Canadian National Railroad Link

The movement of "intermodal containers" (ship/rail/truck) is an important revenue source for the Class 1 railroads, and major intermodal investments have been made in the IFTI area. Table 23 provides links to the system maps and intermodal maps for the four largest Class 1 railroads that serve the U.S. The NS intermodal link, which leads to a map showing port connections ("River," "Lake," and "Ocean/Gulf,") also has a link that opens another map showing Norfolk Southern's transloading facilities for coal.

Table 23. Links to System and Intermodal Maps for the Largest Class 1 Railroads

System Map	BNSF	CSX	NS	UP
Intermodal Map	BNSF	CSX	NS	UP

Table 24 provides links to the website for each of the largest seven Class 1 railroad that serve the U.S., plus Ferromex which is Mexico's largest railroad. Table 25 provides links to a dozen regional or local (non-Class 1) railroads. Seven of the listed companies (Genesee & Wyoming, Ironhorse Resources , OmniTRAX, Pinsly, Pioneer Railcorp, R.J. Corman, and RailAmerica) are parent companies for multiple railroads, including at least one each located in the IFTI area.

Table 24. Class 1 Railroads Operating in the United States

– Burlington Northern Santa Fe Railroad – Canadian National Railroad – Canadian Pacific Railway – CSX	– Ferromex – Norfolk Southern Corporation – Kansas City Southern – Union Pacific Railroad

Table 25. Selected Non-Class 1 Railroads Operating in the United States

– Arkansas and Missouri Railroad – Florida East Coast Railway – Genesee & Wyoming – Ironhorse Resources – Mississippi Export Railroad – Nashville and Eastern Railroad	– OmniTRAX, Inc – Paducah & Louisville Railway – Pinsly Railroad Company – Pioneer Railcorp – R.J. Corman Railroad Group – RailAmerica

Many of the local and switching and terminal railroads are owned by a small business, shippers group, or local governments, and many do not have web pages. The websites for the Class 1 railroads have contact information for the non-Class 1 lines that interconnect with the respective Class 1. (Hint: Search the Class 1 site for "shortline.") Also, many of the state departments of transportation have directories with contact information for railroads within their state.

None of the Class 1 railroads have headquarters or major regional or corridor centers in the IFTI area. Operating managers and personnel are based at rail yards and intermodal facilities, and key personnel from the corporate level are assigned to work with state and local officials, depending on the issue. The railroads are often involved in major economic development activities, and railroad representatives are probably involved with the statewide Operation Lifesaver program. The Class 1s have nationwide, toll-

free, 24/7 numbers to contact their police department or emergency operations center to report problems at highway-rail crossings, blocked tracks, environmental or hazardous material problems, theft or vandalism. The Class 1 railroads make extensive use of technology to control and monitor their systems.

The non-Class 1 railroads operate like most small businesses. Managers and other employees often perform multiple tasks and probably live in one of the served communities. These smaller railroads all interconnect with one or more of the Class 1s.

Two primary organizations represent the interests of U.S. railroads and provide opportunities for professional interaction and continuing education, the Association of American Railroads (AAR) and the American Short Line and Regional Railroad Association (ASLRRA). These organizations are also valuable sources of current information about the railroad industry. State associations of railroad operators have been formed in many states, including the Tennessee Rail Alliance, the Georgia Railroad Association, and the Railway Association of North Carolina.

The American Railway Engineering and Maintenance of Way Association (AREMA) is an association of railroad engineers and other industry professionals. The American Association of Railroad Superintendents and the American Railway Development Association (ARDA) also provide opportunities for professional development and sharing of information.

Railroads and railroad personnel are subject to various federal rules and regulations. The transportation-specific regulations are enforced primarily by the Federal Railroad Administration (FRA). State regulations are limited to matters not preempted by federal regulation. However, some states participate in the state safety inspectors program mentioned previously. The Surface Transportation Board has authority over the railroads related to economic matters, particularly rate and service issue.

Education and training in the railroad industry are accomplished primarily through the railroad companies, the organizations and associations described above, and business and engineering schools. The AREMA has launched an initiative underway to encourage engineering schools to give more attention to railroads. The Railroad Engineering Program at the University of Illinois is a comprehensive program in education, research, professional development, and outreach.

The Railroad Research Foundation (RRF) is a 501(c) (3) organization "established to become a world-class policy research organization devoted to sustaining a safe, secure, technologically advanced and productive market-place driven railroad industry."

The Transportation Technology Center, Inc. (TTCI), headquartered near Pueblo, Colorado, is a wholly owned subsidiary of the Association of American Railroads. TTCI manages the Federal Railroad Administrations' (FRA) Transportation Technology Center (TTC) to test and develop new technologies for rolling stock, vehicle and track components, and safety devices.

Waterways

The waterway or "marine transportation" industry is also very diverse. The most basic distinction among companies is between domestic and international shipping, but many other categories and classifications are significant. The differences between deep-draft and shallow-draft vessels and ports is important, as are the geographic areas/markets served, and the parts of the waterway system where the company operates (e.g., inland, costal and intercostal, Great Lakes, St. Lawrence Seaway, ocean). Some marine transportation companies specialize in specific types of cargoes that require special equipment and handling, and some companies specialize in port operations or providing services for vessels and equipment.

Figure 13 shows the location of the approximately 350 ports in the U.S. including deepwater costal ports, ports on the Great Lakes and St. Lawrence Seaway, and ports on the navigable inland waterways.

Figure 13. Locations of U.S. Ports (Dobbins, 2007)

Many different types of vessels are used to provide marine transportation. Ocean-going, sometimes referred to as "blue water," vessels can be divided into the following categories: breakbulk, bulk carriers, roll-on/roll-off (RoRo), LASH (Lighter Aboard Ship), tanker, specialty[7], and the containership[8]. (Dobbins, 2009)

[7] Specialty ships include cruise ships, research vessels, ships designed for unique cargoes, and ships such as the RMS St. Helena built to serve unique destinations.

[8] The containership was the idea of a North Carolina truck company owner, Malcolm McLean, in 1956. Beginning with a retrofitted tanker ship operating from Newark to Houston, McLean built a business that grew to be known as Sea-Land. In 1999, after a short period of ownership by the CSX Corporation, Sea-Land was sold to a Danish conglomerate, the A.P. Moeller Group (Maersk Line). (Cudahy 2006)

Ocean-going ships do not serve the IFTI area directly, but the importance of international trade to the area and to the entire nations is significant and growing (not to mention our dependence on oil moved by tankers). The fastest growing segment of international shipping revolves around "containers" moved by containerships, rail, and truck. Approximately 5,000 containerships operate worldwide with capacity for approximately 13 million containers. (AXS-Alphaliner 2009) The value of global container shipping in 2005 was approximately $6.5 trillion. (Poston 2006) Current information on the numbers of oceangoing ships of all types is available from the Lloyd's "Seasearcher" website. Link

Moving closer to the IFTI area, the American Waterways Operators (AWO) is an association that describes itself as serving "the American tow boat, tug boat, and barge industry." The AWO website offers a "Vessels Tour" slide show that illustrates the range of equipment used by the AWO member companies. Link

Marine businesses in the IFTI area are focused on the inland waterway system and the Gulf intercostal connections as illustrated in Figure 14. The figure also shows the tons of cargo moved by segment in 2004 and highlights the importance of the Mississippi and Ohio Rivers and their tributaries.

The marine transportation companies in the IFTI area often described as being in the "barge business." They own barges and boats and terminals and equipment to load and offload, and they operate 24/7. Barges in the IFTI area transport primarily coal, grain, aggregates, chemicals, and steel.

Barges come in different sizes and configurations, but most fit into one of four categories (deck, open hopper, covered hopper, or tank). The standard size of barges on the inland waterways is 195 feet long and 35 feet wide with up to a 9-foot draft. On the river sections with locks, "tows" are generally limited to 15 barges (three wide by five in length). On the lower sections of the Mississippi tows may include 40 barges or more. Barges are moved by tow boats that vary in size and horsepower, from work boats to towboats that are 200 feet long and 50 feet wide with 10,000 horsepower. Figure 15 is an often used illustration to highlight the capacity of barges compared with other modes of transportation.

Table 26 provides link to sixteen different companies that provide marine transportation services. The list includes more companies that serve the inland waterways that other components of the system, but an attempt was made to provide a representative list. APL and Maersk operate ocean-going ships. APL is based in the U.S. but is now a subsidiary of Singapore-based Neptune Orient Lines. Maersk, one of the largest operators of containerships, is part of the A.P. Moeller-Maersk group.

American Steamship Company (ASC) and The Great Lakes Group operate primarily on the Great Lakes. McAllister Towing specializes in boat docking and harbor services on the East Coast. Bay-Houston Towing Company specializes in Gulf Coast harbor services and towing. AEP River Operations is a subsidiary of American Electric Power. American River Transportation Company (ARTCO) is a subsidiary of Archer Daniels Midland (ADM) and operates barges to transport ADM products. ADM also owns and operates ocean-going vessels to transport ADM products. (ADM 2009)

Figure 14. Map of the U.S. Inland and Intercostal Waterways with 2004 Tonnage (Dobbins 2007)

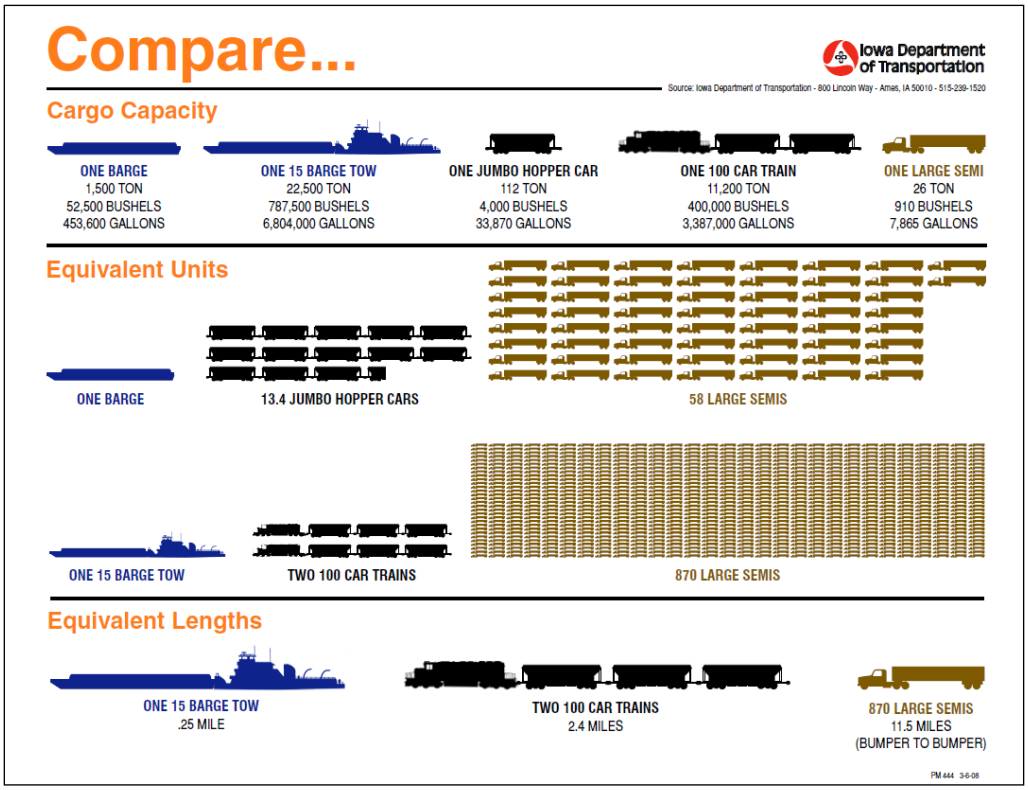


Figure 15. Comparing the Capacity of Barges with Rail Cars and Truck Trailers Link

The largest independent inland barge operators include Ingram barge and Kirby Corporation. Ingram operates a fleet of about 4,000 barges, 100 line haul vessels, and 40 boats under 1,800 horsepower. Kirby has the largest number of tanker (liquid cargo) barges. Other companies on the list also operate on the inland waterway system, some specializing with certain types of equipment or by operating on certain waterway segments.

The Osprey Line is included because it is operating an innovative container-on-barge service barge along the Gulf Coast and between Memphis and New Orleans. Osprey Line is owned by Kirby Corporation (also included in Table 26) and Cooper/T. Smith Corporation, a "maritime services industry entity with core activities in stevedoring, terminals, harbor docking tugs, barge transportation, logistics, wood chip production and sales, and [insurance] . . . ." Fullen Dock and Warehouse in Memphis is the local partner.

Table 26. Examples of Companies in Marine Transportation Businesses

– AEP River Operations – American Commercial Lines Inc. (ACL) – American River Transportation Company (ARTCO) – American Steamship Company (ASC) – APL (American Presidents Line) – Bay-Houston Towing Co – Golding Barge Line – Ingram Barge Company	– Kirby Corporation – Maersk Line – Marquette Transportation Company – McAllister Towing – Osprey Line – Parker Towing – SCF Marine – The Great Lakes Group

A number of organizations represent the interests of companies in marine transportation businesses and provide opportunities for professional interaction and continuing education. These organizations are also sources of current information about the industry. Some of these organizations have a national perspective. Others focus more on specific geographic areas. Examples include the following:

- American Association of Port Authorities (AAPA)
- The American Waterway Operators (AWO)
- Inland Rivers Ports and Terminals (IRPT)
- Mississippi Valley Trade & Transport Council (MVTTC)
- National Waterways Conference
- Tennessee-Tombigbee Waterway Development Council
- Texas Waterway Operators Association
- Upper Mississippi Waterway Association
- Waterways Association of Pittsburgh
- Waterways Council Inc (WCI)

Other associations focused on segments of the waterway system include the Atlantic Intracoastal Waterway Association, Lake Carriers' Association, and the Pacific Northwest Waterways Association.

Marine transportation companies and their operating personnel are subject to federal regulations and licensing requirement that depend on the type of vessel and operating environment. The U.S. Coast Guard is responsible for most of the transportation-specific regulations. However, marine operators

also work closely with the U.S. Maritime Administration, U.S. Army Corp of Engineers, local port authorities, homeland security agencies, and, in the IFTI area, the Tennessee Valley Authority (TVA).

Professional development and continuing education in marine transportation is accomplished through the organizations and associations described above, individual company programs, and programs offered by the Maritime Academies, the Seaman's Church , and public agencies.

The American Waterways Operators (AWO) sponsors a voluntary accreditation program with a unique feature. The "Responsible Carrier Program (RCP)" is a requirement for membership in the organization. The AWO describes the program as follows:

> The industry-initiated Responsible Carrier Program (RCP) is designed as a framework for continuously improving the industry's safety performance. AWO members use the RCP as a guide in developing company-specific safety and environmental programs that are tailored to the unique operational environments found in the barge and towing industry. The program complements and builds upon existing government regulations . . .
>
> The RCP incorporates best industry practices in three primary areas, including company management policies, vessel equipment and human factors. The comprehensive program requires companies to obtain a third party audit by an AWO-certified auditor to verify compliance. . . . (AWO 2009)

Pipelines

Pipelines are the least visible part of the transportation system, but pipelines are critically important for virtually every community in the transportation of: (1) crude oil , (2) refined petroluem products, and (3) natural gas. Pipelines account for approximately two-thirds of all petroleum movements (crude oil and refined products) and virtually all of the transportation of natural gas. Other products are sometimes moved in pipelines (e.g.,carbon dioxide, anhydrous amonia, nitrogen, oxygen, hydrogen, and coal slurry), but such uses are for specific circumstances. (Rabinow 2004)

Descriptions of the U.S. pipeline system usually incude the number of miles of various categories of lines, but the sources do not always seem to agree. For instance, the numbers cited by the Bureau of Transportation Statistics (Table 9) are different from those cited on the Pipleine Security Division of the Transportation Security Administration's website. The reasons are unclear but may be attributable to difffences in the terms used and the way certain lines are categorized.

Pipelines are frequently divided into three catgeories:

- Gathering pipelines—groups of relatively small interconnected pipelines that bring crude oil or natural gas from wells and platforms to a consolidation or processing facility
- Tranmission pipelines—larger diameter pipes to move oil, refined products, natural gas and sometimes other products over longer distances, from producing areas to refinerers or consuming areas

– Distributing pipelines—relatively small interconnected pipelines with small diameters, used to take products to the final consumers—homes, businesses, and other locations, and to move products within storage areas

"Pipleine 101," a combined online effort by the American Petroleum Institute (API) and the Association of Oil Pipe Lines (AOPL) uses these three distinctions[9] and provides the numbers shown in Table 27.

Table 27. Miles of Pipeline in the United States

	Gathering (miles)	Transmission (miles)	Distributing (miles)
Crude Oil	30,000-40,000	55,000	not applicable
Refined Petroleum Products	not applicable	95,000*	
Natural Gas	20,000 +/-	278,000	1.8 million

*Most refined petroleum products are delivered to large storage tanks and then loaded into tanker trucks for distribution (i.e., delivery to gas stations or other locations). However, some manufacturing plants, major airports, and electrical power generating plants are supplied directly by pipeline.

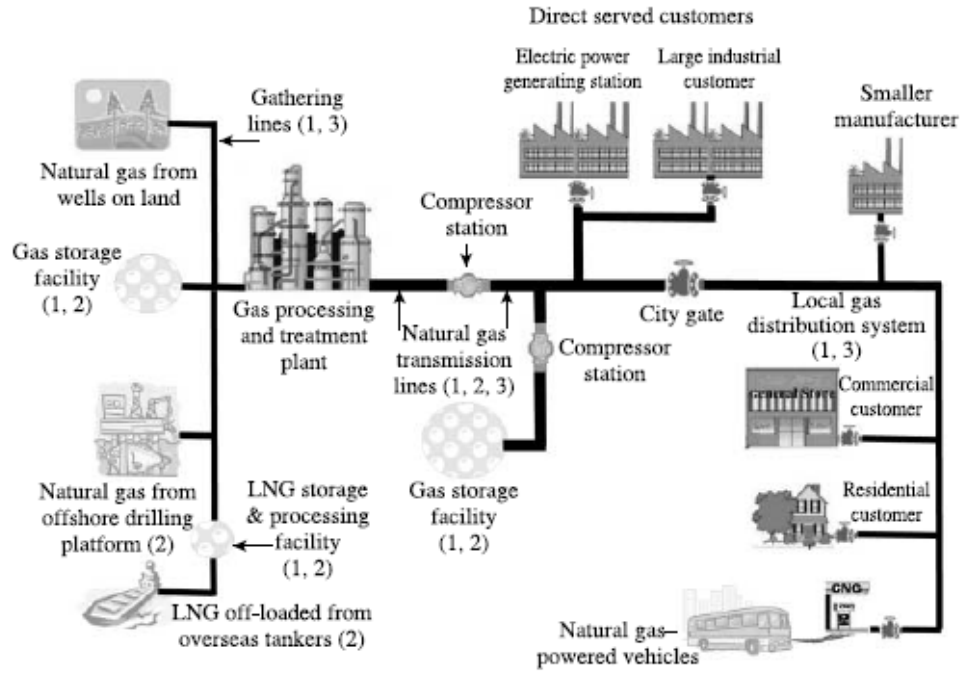
Source: Pipeline 101, Link (November 15, 2009)

Information on the specific location of pipelines and related facilities (interconnections, compressor stations, valves, gates, storage sites) is less available than prior to 9/11. However, industry and government officials have online access to information about the location of transmission lines through the GIS-based National Pipeline Mapping System (NPMS). Schematic maps of crude and refined products are available from the "Pipeline 101" website. Schematic maps for natural gas pipelines and related facilities are available from the Energy Information Administration. (EIA undated)

Figure 16 is a depiction of the natural gas pipeline system. A similar graphic for crude oil and refined products is available on the *Pipeline 101* website. In Figure 16 "OPS" refers to the Office of Pipeline Safety in the USDOT. "FERC" refers to the Federal Energy Regulatory Administration, an independent regulatory agency. The FERC has certain regulatory authority over both oil and gas pipelines, but the range of authority is different. Oil pipelines are regulated as "common carriers" while natural gas companies are regulated as "public utilities." (Reed 2009)

The ownership of U.S. pipelines includes a mixture of corporations, limited partnerships, master limited partnerships, limited liability corporations, and shared ownership. More than 200 companies operate interstate oil pipelines, and almost 800 operate natural gas transmission lines. (TRB 2004) The Transportation Security Administration estimates that more than 1,300 companies operate natural gas distribution lines. (TSA undated) Link

[9] *Pipeline 101* also uses the term "trunk line" to describe the "transmission" lines.



(1) - OPS is responsible for regulating the safety of natural gas transportation pipelines and liquefied natural gas (LNG) facilities, including safety aspects related to design, construction, operation, and maintenance. Minimum safety requirements for gas pipelines and LNG facilities are prescribed by 49 CFR Parts 191, 192, and 193.

(2) - FERC is responsible for the regulation of interstate natural gas pipelines, siting for pipelines, storage, and onshore LNG import facility construction. FERC is also responsible for regulation of natural gas transportation in interstate commerce; issuing certificates of public convenience and necessity to prospective companies providing energy services or constructing and operating interstate pipelines and storage facilities; regulation of facility abandonment; establishment of rates for services; regulation of the transportation of natural gas as authorized by the Natural Gas Policy Act and the Outer Continental Shelf Lands Act; and oversight of the construction and operation of pipeline facilities at U.S. points of entry for the import or export of natural gas.

(3) - Rates for natural gas sold by local distribution companies to end users are generally established by state regulatory authorities (e.g., public service or public utility commissions) or local utility districts, municipalities, or natural gas authorities. States also have a key role in regulating and ensuring intrastate pipeline safety. Some states act as interstate agents for OPS in the regulation of interstate transmission lines. States are involved in environmental permitting and local routing decisions for new pipelines, emergency response planning, training, and exercises.

Figure 16. Regulation of Various Parts of the Natural Gas Pipeline Systems (TRB 2004)

The *Interstate Natural Gas Pipeline Desk Reference* describes the "segments" of the industry as follows:

> The U.S. natural gas industry has three traditional segments and three emerging segments that are part of the value chain that delivers natural gas from the wellhead to the consumer. *Production companies* explore, develop and produce natural gas from underground natural gas and oil fields. *Transportation companies* operate the pipelines that link natural gas fields and processing plants to major consumer areas. *Local gas distribution (LDC) utilities* receive natural gas from transportation pipelines and deliver it to individual customers. (INGGA 2009)

This paper is focused on *transportation* businesses, but all of the segments of the natural gas industry are interconnected, and the relationships seem likely to become even more complex. The *Desk Reference* continues:

> Three emerging segments of the natural gas industry reflect the evolution that has occurred in the wake of the industry's restructuring. *Gathering and processing*, often referred to as the mid-stream segment of the natural gas value chain, has emerged as a distinct natural gas industry segment with companies focused on this business that are neither producers nor natural gas transportation pipelines. Another emerging segment of the industry in North America is the *coastal terminals* that receive and regasify liquefied natural gas (LNG) that is delivered . . . by specially designed ocean-going ships. Finally, while they do not own and operate physical assets, the pipeline shippers that hold title to natural gas that is delivered to LDCs, power plants and other end-users could be seen as . . . a distinct segment of the industry. (INGAA 2009)

Table 28 provides links to some of the largest companies that are in the pipeline "transportation" business. Many of these companies also have interests in other oil, natural gas, and related businesses. Some operate both oil and gas pipelines. Companies are listed under the heading that seems to account for the majority of their business.

Table 28. Examples of Companies Operating Oil and Natural Gas Transmission Pipelines

Oil	
– Colonial Pipeline – ConocoPhillips Pipe Line – Enbridge Energy – Enterprise Products Partners – ExxonMobil Pipeline – Kinder Morgan Energy Partners	– Magellan Midstream Partners – NuStar Energy – Plains All-American Pipeline – Sunoco Logistics Partners – TEPPCO Partners
Natural Gas	
– ANR Pipeline – El Paso Natural Gas – Gulf South Pipeline – Kinder Morgan – NiSource Gas Transmission & Storage – Northern Natural Gas	– ONEOK – Targa Resources – Tennessee Gas Pipeline (El Paso) – Texas Eastern Transmission – TransCanada – Transcontinental Gas Pipe Line

The following organizations represent the interests of companies in the pipeline business and provide opportunities for professional interaction and continuing education. These organizations are also sources of current information about the industry:

- American Gas Association
- American Petroleum Institute (API)
- American Public Gas Association (APGA
- Association of Oil Pipe Lines (AOPL)
- Interstate Natural Gas Association of America (INGAA)
- International Pipeline and Offshore Contractors Association (IPLOCA)
- Southern Gas Association (SGA)

The pipeline industry is subject to federal rules and regulations, some that apply specifically to pipelines and some that cover all aspects of the oil and gas industries. The Office of Pipeline Safety (OPS) in the USDOT has significant responsibilities for pipeline safety, and the OPS has a website, tilted "Our Federal Partners," that describes the roles of other federal agencies. Another OPS website describes the regulations and major incidents that have occurred in each state.

The pipeline industry also invests in public education programs related to pipeline safety, and the industry programs complement public sector programs. See, for instance, Pipeline Association for Public Awareness, National Association of Fire Marshalls, National Association of Pipeline Safety Representatives (NAPSR), Office of Pipeline Safety, and TSA, Pipeline Security Division.

Professional development and continuing education in the pipeline industry are accomplished through the organizations and association listed above, the Professional Institute of Pipeline Engineers (PIPE), and educational institutions.

Transportation Management and Logistics Services

Many of the companies already described in this paper include "logistics" in describing the range of their company's services. This section adds some information to better describe "logistics servces." First, however, some companies need to be mentioned that *specialize* in providing logistics servces without owning or operating aircraft, trucks, trains, boats, barges, or pipelines. Two large U.S-based companies that provde these types of services, both Fortune 500 companies, are C.H. Robinson and Expeditors International of Washington.

C.H. Robinson describes itself as a "third party logistics company" and as a "non-asset based" transportation provider. The following is from the company's 2008 annual report:

> C.H. Robinson Worldwide . . . is one of the largest third party logistics companies in the world with 2008 gross revenues of $8.6 billion. We provide freight transportation services and logistics solutions to companies of all sizes, in a wide variety of industries. During 2008, including our transportation management services business, we handled approximately 7.3 million shipments for more than 32,000 customers. We operate through a network of 228 offices . . . in North America, Europe, Asia, South America, and the Middle East. We have developed global multimodal transportation and distribution networks to provide logistics services worldwide. . . .

> We are a non-asset based transportation provider, meaning we do not own the transportation equipment that is used to transport our customers' freight. Through our contractual relationships with approximately 50,000 transportation companies, including motor carriers, railroads (primarily intermodal service providers), airfreight and ocean carriers. We select and hire the appropriate transportation to manage our customers' freight needs. . . . As an integral part of our transportation services, we provide a wide range of value-added logistics services, such as supply chain analysis, freight consolidation, core carrier program management, and information reporting. (C.H. Robinson 2009)

C.H. Robinson began in the early 1900s in the fresh produce business, and that business line continues. The company purchases fresh produce through a network of independent produce suppliers. The customers include regional and national grocery retailers and restaurants, produce wholesalers, and foodservice distributors.

A third business line is a subsidiary, T-Chek Systems. The T-Chek customers are primarily motor carriers that purchase management and information services such as fuel management, funds transfer, permit procurement, fuel and use tax reporting, and driver funds transfer. For several companies and truck stop chains, T-Chek captures sales and fuel cost data, provides management information to the seller, transfers funds to the truck stop, and invoices the carrier for fuel, cash advances, and the T-Check fee.

Expeditors International of Washington, Inc. focuses on international freight movements. The company's 2008 annual report includes the following description of their business:

> Expeditors International of Washington, Inc. . . . offers its customers a seamless international network supporting the movement and strategic positioning of goods. The Company's services include the consolidation or forwarding of air and ocean freight. In each United States office, and in many overseas offices, the Company acts as a customs broker. The Company also provides . . . distribution management, vendor consolidation, cargo insurance, purchase order management and customized logistics information. The Company does not compete for domestic freight, overnight courier or small parcel business and does not own aircraft or steamships. (Expeditors 2009)

According to their annual report, airfreight services accounted for approximately 36 percent of the company's net revenues in 2008. Ocean freight services accounted for approximately 25 percent, and customs brokerage and other services for 39 percent. These percentages were approximately the same for 2006 and 2007.

The Expeditor's annual report also includes this description:

> The goods handled . . . are generally a function of the products which dominate international trade between any particular origin and destination. Shipments of computer components, other electronic equipment, housewares, sporting goods, machine parts, and toys, comprise a significant percentage of the Company's business. Typical import customers include computer retailers and distributors of consumer electronics, department store chains, clothing and shoe wholesalers, manufacturers and catalogue stores. (Expeditors 2009)

Expeditors International operates offices in more than 250 cities worldwide, including Memphis and Nashville as well as Atlanta, Huntsville, Knoxville, Louisville, New Orleans, Raleigh-Durham, Savannah, St.Louis and approximately 60 other cities in the U.S.

Other companies are sometimes described as "asset-light" transportation providers. An example is the HUB Group, which describes itself as an "intermodal marketing company." HUB Group specilaizes in movements by highway and rail combined, by contracting with railroads for the long-haul portion of the shipment. The highway movement is contracted to local trucking companies or handled by HUB Group subsidiaries, Comtrak (based in Memphis) and Quality Services (QS). According the Hub Group annual report for 2008, the two subsidiaries owned a combined 293 tractors, leased 21 tractors, leased or owned 603 trailers, employed 321 drivers and contracted with 914 owner-operators at the end of 2009. Hub Group also provides truck brokerage services and owns Unyson Logistics. Hub Group has operating centers in 20 cities. (HUB 2009)

The Hub Group's annual report for 2008, includes these descriptions of how customers are served:

> In a typical *intermodal* transaction, the customer contacts one of our intermodal operating centers to place an order. The operating center consults with the centralized pricing group, obtains the necessary intermodal equipment, arranges for it to be delivered to the customer by a drayage company and, after the freight is loaded, arranges for the transportation of the container or trailer to the rail ramp. Relevant information is entered into our Network Management System . . . [and] our predictive track and trace technology then monitors the shipment . . . and alerts the customer service personnel if there are service delays. The assigned operating center then arranges for and confirms delivery by a drayage company at destination. After unloading, the empty equipment is made available for reloading . . .
>
> In a typical *truck brokerage* transaction, the customer contacts one of our highway operating centers to obtain a price quote for a particular freight movement. . . . The operating center makes the delivery appointment and arranges with the appropriate carrier to pick up the freight. Once it receives confirmation that the freight has been picked up, the operating center monitors the movement of the freight until it reaches its destination and delivery has been confirmed. If the carrier notifies us that after delivering the load it will need additional freight, we may notify the operating center located nearest the destination of the carriers availability. Although under no obligation to do so, that operating center then may attempt to secure additional freight for the carrier. (HUB 2009)

Another "asset-light" company is Landstar, which owns a fleet of about 13,800 trailers (including flatbed, refrigerated, and heavy-duty units as well as standard dry vans) that are operated primarily by independent contractors. Independent sales agents market the company's services.

According to Hoovers, a Dunn and Bradstreet company that provides company profiles:

> Landstar's freight carrier units transport general commodities and goods such as automotive products, building materials, and machinery, as well as ammunition. Major customers include third-party logistics providers and government agencies such as the US Department of Defense. In addition to truckload transportation, Landstar offers logistics services.

> Landstar's logistics offerings include intermodal services, . . . arranging the transportation of freight moved by multiple methods . . . The company also offers expedited transportation, freight brokerage, international air and ocean freight forwarding, and warehousing services. In a move to build up its supply chain services, Landstar bought two Michigan-based companies in July 2009: Premier Logistics and A3 Integration. . . .
>
> In 2006 Landstar expanded its logistics offerings by entering the warehousing business in an asset-free way: The company buys capacity from warehouse owners and resells it to customers. Landstar is working to expand its network of warehouse capacity providers.
>
> In addition . . . Landstar operates insurance units that provide property and casualty coverage for the company's subsidiaries and independent contractors.

Many other "non-asset" and "asset-light" companies offer services that are similar to the ones described above for C.H. Robinson, Expeditors International, Hub Group, and Landstar. Other large companies based in the U.S. that provide transporation management and logistics services include CEVA, Excel, Pacer , Transplace, UTi, and Menlo (a Con-Way subsidiary) .

Table 29 provides links to the websites for ten additional firms that operate in the IFTI area and descibe themselves as providing transportation and logistics services. Some focus on specfic niches.

Table 29. Examples of Third-Party Logistics Companies Serving the IFTI Area

– Centrix Logistics.	– Mallory Alexander International Logistics
– Cornerstone Systems	– Sun Coast Logistics
– CTSI-GlobalDepot	– Tiger Logistics
– D J Powers Co.	– V. Alexander & Co
– Katt Worldwide Logistics	– Wagner Industries

In addition to all of the firms that are described above in terms of "third-party logistics, "non-asset," and "asset-light," many of the "asset based" companies described previously also offer such services. UPS, FedEx, air freight companies, most of the trucking companies, the Class 1 railroads, and many of the marine transportation companies offer a suite of transportation and logistics services for their customers.

Figure 17 is a screenshot of a "decision support tool" from the *Inbound Logistics* website. The purpose of the tool is to identify potential third-party logistics companies based on multiple variables. The tool selects from among 100 "top" companies. Firms are included on the list of 100 based on voting by readers. The tool is included here because it highlights the range of services, specialties, and business models that fall under the umbrella of "transportation management and logistics." The tool can be accessed for closer examination at http://www.inboundlogistics.com/3pl/3pl100.shtml.

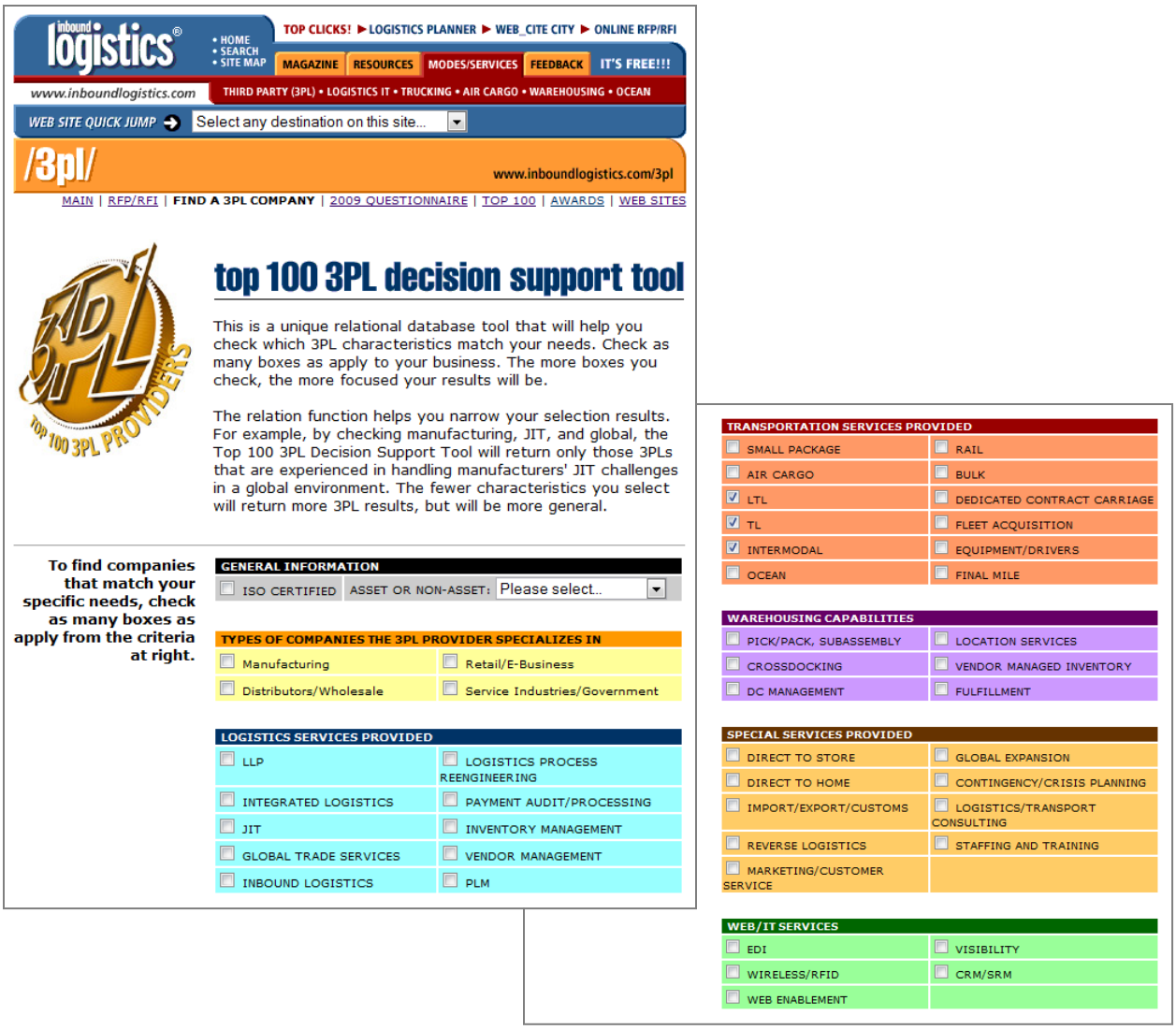


Figure 17. "3PL" Decision Support Tool from *Inbound Logistics*

Several organizations represent the interest of companies and individuals involved in transportation and logistics and provide forums for exchange of information and professional development. These include the Airforwarders Association (AfA) American Society of Transportation and Logistics (AST&L), Council of Supply Chain Management Professionals (CSCMP), International Society of Logistics (SOLE), International Warehouse Logistics Association, and the National Customs Brokers & Forwarders Association of America (NCBFAA).

The AST&L and SOLE each sponsor professional development and accreditation programs. The CSCMP sponsors a unique "Professional Career Path/Recognition Program," whereby "companies and their programs will be qualified and recognized, and the company-selected candidates will be recognized annually by CSCMP and included in its worldwide community of practice." Link

Similarities, Common Interests, and Collaboration Among Freight Transportation Businesses

In spite of the differences among the companies described on the previous pages, the "companies in the freight transportation business" have some important characteristics in common, especially when compared to public agencies. Table 30 displays corporate mission and vision statements from a dozen freight transportation companies. These statements were found by searching company websites. The objective was to include companies representing a range of modes and services. Some of the websites included statements of company values, ethical codes, and other principles for doing business, but only the vision and mission statements are included in Table 30. In a few cases, the vision statements were lengthy, and only concise statements are included in the table. (No mission or vision statements were found for a pipeline company.)

Table 30. Selected Corporate Mission and Vision Statements

Company	Mission Statement
American Commercial Lines Link	Vision: Continue to transform ACL from a barge operator and manufacturer into a transportation company serving the evolving needs of the marketplace. Mission: Deliver premium transportation services and solutions to meet the evolving needs of our customers.
Covenant Transport Link	Covenant's mission is simple and direct and a part of everything we do: To be the best on-time service provider by consistently maintaining trained employees and a superior customer base. We expect high ethical, moral and professional standards as we interact with our internal and external customers.
Excel Link	Our mission: Make the most of our scale, experience and passion to build global leadership in logistics, and to become the first choice for customers and associates.
FedEx Corporation Link	Mission: FedEx will produce superior financial returns for shareowners by providing high value-added supply chain, transportation, business and related information services through focused operating companies. Customer requirements will be met in the highest quality manner appropriate to each market segment served. FedEx will strive to develop mutually rewarding relationships with its employees, partners and suppliers. Safety will be the first consideration in all operations. Corporate activities will be conducted to the highest ethical and professional standards.
Ingram Marine Group Link	Mission: To excel in our marine transportation, fueling, dredging, and terminaling businesses by empowering every associate to continually improve service to our customers, setting the industry standard for excellence.
Maverick Transportation Link	Our Vision is to be viewed as the symbol of excellence in the transportation industry, always recognizing our customers' needs and exceeding their expectations. Our Mission is to be an efficient and profitable company that provides safe, professional transportation services, utilizing well-trained employees, state-of-the-art information systems, and a well-maintained, modern fleet.
Norfolk Southern Link	Our Vision: Be the safest , most customer-focused and successful transportation company in the world. Norfolk Southern's mission is to enhance the value of our stockholders' investment over time by providing quality freight transportation services and undertaking any other related businesses in which our resources, particularly our people, give the company an advantage.

Pacer International Link	Our Vision: To be the customers' preferred choice, earning customer confidence every day by reliably delivering best-in-class door-to-door transportation services and logistics solutions.
Swift Transportation Link	At Swift Transportation our mission is to attract and retain customers by providing Best in Class transportation solutions and fostering a profitable, disciplined culture of safety, service, and trust.
Union Pacific Corporation Link	Vision: Building America Our vision symbolizes the Union Pacific experience for all the people whose lives we touch. It connects the importance of UP's rail transportation to America's economy, honors the generations that preceded us and is the promise for the generations that will follow us. Mission: The Men and Women of Union Pacific Are Dedicated to Serve. Union Pacific works for the good of our customers, our shareholders and one another. Our commitment defines us and drives the economic strength of our company and our country.
USA Truck Link	USA Truck's mission is to provide innovative and superior transportation solutions that exceed our customers' expectations. We will foster an ethical and safe culture where our employees are challenged, empowered and rewarded to continuously improve customer and shareholder value.
Werner Enterprises Link	Mission Statement: To deliver value to our customers, business partners and shareholders through leading edge global supply chain solutions that exceed expectations and promote safety while we remain customer focused and asset-backed. Vision Statement: To be recognized as a global logistics partner providing customized supply chain solutions that manage cost, improve visibility and pursue continuous improvement throughout our customers' network.

Although this is obviously a small sample of the thousands of transportation companies that operate in the IFTI area, not to mention nationally and internationally, some similarities among these corporate statements are notable:

- Every one of the twelve statements includes references to "customers," in term of meeting customer "needs," "expectations, "and "requirements."
- Seven of the corporate statements also refer to meeting the expectations of "shareholders" or to being a "profitable" company.
- Nine of the twelve corporate statements include reference to the importance of "employees" or "associates" in accomplishing their company's mission.
- Nine use the word "transportation." Only three refer to a specific mode of transportation. Three refer to "logistics," including the two companies that are third-party providers.

Another comparison was performed by examining "10-K" reports, which all publicly traded companies are required to file annually with the Securities and Exchange Commission (SEC). The 10-K format includes a "Risk Factors" section to warn investor and potential investors of potential problems. Recognizing that the 10-K report is for that specific purpose only, comparing the reports of companies in the freight transportation business offers some additional insight on freight transportation in the U.S.

Reports were examined from the following companies:

1. American Commercial Lines, Inc
2. Arkansas Best Corporation
3. Atlas Air Worldwide Holdings, Inc.
4. C.H. Robinson Worldwide, Inc.
5. CSX Corporation
6. FedEx Corporation
7. J.B. Hunt Transport Services, Inc.
8. Landstar System, Inc.
9. Union Pacific Corporation
10. United Parcel Service, Inc
11. Werner Enterprises, Inc.
12. YRC Worldwide Inc.

As with the previous comparison of mission statements (Table 31) the goal was to have a representative group of companies by types of service. The only company included in both groups (i.e., mission statements and 10-K reports) is FedEx. As noted, only publicly-traded companies are required to file 10-K reports, so no privately-owned companies are included in the later group.

Most of the descriptions of Risk Factors in the 10-K reports are many pages in length. The comparisons of those pages revealed many similarities, as summarized below.

All of the reports describe risks associated with the difficult economic conditions during 2008, and all of the reports address competitive risks. Most include the risks of losing major customers—to another carrier, another mode of transportation, self-operation, or the customers' financial failure. One addresses competition from the USPS and postal services in other countries.

All of the reports describe risks associated with government regulations. Costs of compliance, impacts on the ability to serve customers, and potential liability for non-compliance are all cited as risks. Categories of regulation mentioned in describing risks include economic, safety, environmental, labor, employment, and security. Terms used to describe the regulatory environment include "extensive," "highly regulated," and "complex and stringent."

Risks associated with human resources are also cited in most of the reports. Sources of risks include the ability to recruit and retain qualified operating personnel, collective bargaining, and dependence on key managers.

Risks associated with injury and property damage claims and insurance are described in most of the reports. Specific risks are associated with costs of claims and insurance premiums, numbers of claims, costs per claim, and availability of insurance. Several of the reports refer to pending lawsuits.

Most of the reports describe risks related to borrowing and cash flow, including references to credit and capital markets and interest rates. Some pointed to similar considerations for their customers and the customers' associated ability to meet obligations.

Risks that may be especially pertinent in the context of emergency management include the following:

- All of the reports describe risks associated with fuel—price increases, volatility, and potential disruptions in fuel supply. Many of the reports express uncertainty about being able to use fuel surcharges in the future to pass on unexpected price increases.

- Most of the reports refer to the company's reliance on information technology and the risks associated with even temporary interruptions of service or loss of data.

- Several of the reports refer to dependence on other companies, including "partners' in the intermodal system, but also vendors and suppliers.

- All of the twelve refer to natural disasters (or natural phenomenon) as a source of risks. Five cited hurricanes as examples. Three (CSX, FedEx, and Union Pacific) cited earthquakes. The risks include direct impacts on the company but also the impacts on customers, demand for transportation services, and availability of the necessary infrastructure.

Terrorism is described as a risk, but more from the perspective of the costs and service impacts of governmental anti-terrorism measures. The statements address the risks that regulations and procedures may add costs and/or make it more difficult to provide on-time services to customers. In a similar way, only one of the reports (Union Pacific) refers to climate change as a risk. Another refers to possible governmental climate change regulations.

Most of the differences among the reports are attributable to unique features of the respective businesses. The capital-intensive businesses describe the risks of having to make large capital investments based on long-term projections and the potential for underutilized assets. The third-party businesses describe the risks of being dependent on others and potentially liable for the actions of others. American Commercial Lines describes risks associated with the price of steel needed for barge construction. Atlas Air describes risks associated with the market value of older aircraft. C.H. Robinson describes risks associated with fresh produce product liability. FedEx describes risks associated with damage to their reputation or "brand." The railroads describe the risks associated with being required as a "common carrier" to transport hazardous materials. The marine transportation companies describe risks associated with river conditions.

The report from C.H. Robinson describes the "additional difficulties" of international business as follows:

> We provide services within and between continents on an increasing basis. Our business outside of the United States is subject to various risks, including:
> • changes in economic and political conditions and in governmental policies,
> • changes in compliance with international and domestic laws and regulations,
> • wars, civil unrest, acts of terrorism, and other conflicts,
> • natural disasters,
> • changes in tariffs, trade restrictions, trade agreements, and taxations,
> • difficulties in managing or overseeing foreign operations,
> • limitations on the repatriation of funds because of foreign exchange controls,

• different liability standards, and

• intellectual property laws of countries which do not protect our rights in our intellectual property, including but not limited to our proprietary information systems, to the same extent as the laws of the United States. (C.H. Robinson 2009)

Cooperation and collaboration among companies in the freight transportation business occurs through the trade groups and professional organizations discussed previously. Many of those groups and organizations focus on specific modes of transportation and/or geographic areas, but some have much broader perspectives.

One organization not mentioned previously is the Intermodal Association of North America (IANA). The term "intermodal" is often used in a generic sense, but it also has a more specific meaning related to the movement of containers of several standard sizes by ship, rail, and truck. The IANA describes itself as "representing the combined interests of the intermodal freight industry." The IANA members are divided into five voting divisions, and the division descriptions are quoted here because they provide a concise summary of each component of the intermodal system:

> Intermodal Marketing Company Division - companies which act as shipping intermediaries, which arrange, purchase and sell intermodal freight shipments.
>
> Motor Carrier Division - companies which (1) provide truck transportation of freight which has a prior or subsequent movement by another mode of transportation, and/or (2) provide truck transportation of freight other than that which has a prior or subsequent movement by another mode of transportation.
>
> Rail Division - companies which provide intermodal rail transportation and associated intermodal terminal services.
>
> Supplier Division - companies which provide products or services to any member of the association. Examples include: intermodal leasing companies, equipment manufacturers, software/AEI developers, storage and repair, finance/insurance, consultants, etc.
>
> Water Division - companies which provide transportation of freight by water which has prior or subsequent movement by another mode of transportation, and/or provide intermodal stacktrain transportation and, at a minimum, ramp-to-ramp freight delivery, plus port authority and port terminal operators. Link

Representatives from shippers, government/military, associations, the academic community and others are classified as non-voting Associate Members. Link

The freight transportation businesses also interact with each other and with their customers through the National Industrial Transportation League (NITL). The NITL was established in 1907 to represent shippers in their dealings with various regulatory bodies—to be the "Voice of the Shipper." Following deregulation and the growth of the global economy, the League's structure was changed, and now all companies involved in freight transportation are eligible for full, voting membership in the League. The League now describes itself as "The Voice of the Freight Transportation Industry." The NITL's standing committees, according to the 2009 Annual Report, include the following:

- Air Transportation

- Audit
- Domestic Waterways Transportation
- Education
- Hazmat Transportation and Environmental Issues
- Highway Transportation
- Information Technology Advancement
- Ocean Transportation
- Railroad Transportation
- Select Committee on Security Link

The National Defense Transportation Association (NDTA) is an "educational association of government, military, and industry professionals dedicated to fostering a strong and efficient global logistics and transportation system in support of our economy and national security." NDTA also describes itself as "as a vital link among the armed forces, government and industry on current matters of logistics, transportation, travel, distribution, and security."

Companies in the freight transportation business have responded to requests from governmental agencies to cooperate in initiatives related to homeland security. One example is the Critical Infrastructure Partnership Advisory Council (CIPAC), "to facilitate effective coordination between federal infrastructure protection programs with the infrastructure protection activities of the private sector and of state, local, territorial and tribal governments." Link

Several committees have been established as part of the CIPAC initiative. The Postal and Shipping Sector Committee, includes the following members:

- U.S. Department of Defense
- U.S. Department of Health and Human Services
- U.S. Department of Homeland Security
- U.S. Department of Justice
- DHL
- FedEx
- United Parcel Service of America, Inc.
- United States Postal Service

The Transportation Sector Committee includes only public agencies, but four "Modal Sub-Sector" committees have been established. The membership of those committees, shown in Table 31, includes industry organizations and individual companies.

Table 31. Members of the Modal Sub-Sector Committees of the Critical Infrastructure Partnership Advisory Council (CIPAC)

Aviation Modal Sub-Sector	**Maritime Modal Sub-Sector**
– Aerospace Industries Association – Air Carrier Association of America – Air Transport Association – Aircraft Owners and Pilots Association – Airports Council International - North America – American Association of Airport Executives – The Boeing Company – Cargo Airline Association – National Air Carrier Association – National Air Transportation Association – National Business Aviation Association, Inc. – Regional Airline Association	– American Association of Port Authorities – American Waterways Operators – Chamber of Shipping of America – Donjon-Smit, LLC – International Council of Cruise Lines – National Maritime Safety Association – National Waterways Alliance – Offshore Marine Service Association – Passenger Vessel Association – World Shipping Council
Highway and Motor Carrier Modal Sub-Sector	**Railroad Modal Sub-Sector**
– American Trucking Associations – American Bus Association – American Chemistry Council – American Petroleum Institute – American Road and Transportation Builders Association – Border Trade Alliance – The BusBank – Con-Way, Inc. – Detroit-Windsor Truck Ferry – Institute of Markers of Explosives – Intelligent Transportation Society of America – Intermodal Association of North America – International Association of Counterterrorism and Security Professionals – International Bridge Tunnel and Turnpike Association – Kenan Advantage Group – Laidlaw Education Services – Mid-States Express, Inc. – National Association of Small Trucking Companies – National Industrial Transportation League – National School Transportation Association – National Tank Truck Carriers, Inc. – NATSO – Owner-Operator Independent Drivers Association – Taxicab, Limousine and Paratransit Association – Tri-State Motor Transit Company – Truck Manufacturers Association – Truck Rental and Leasing Association – United Motorcoach Association	– Association of American Railroads – American Short Line and Regional Railroad Association – Amtrak – Anacostia and Pacific – BNSF Railway Company – Canadian National – Canadian Pacific Railway – CSX Transportation – Genesee & Wyoming – Iowa Interstate Railroad Ltd – Kansas City Southern Railway Company – Metra – Norfolk Southern – RailAmerica – Union Pacific Railroad Company – Wheeling & Lake Erie Railway

Source: Department of Homeland Security, Link (November 1, 2009)

Finally, transportation businesses are part of broad-based initiatives by the entire private sector to address issues of importance to the public agencies responsible for emergency management and transportation at all levels of government. Examples include the following:

- Americans for Transportation Mobility Coalition
- Business and Industry Council for Emergency Planning and Preparedness (BICEPP) (Los Angeles)
- Business Civic Leadership Center
- Business Continuity Networking Group Contacts
    - Mid-South Association of Contingency Planners (Memphis)
    - Middle Tennessee Chapter of ACP
    - Arkansas Chapter, Association of Contingency Planners
- Business Executives for National Security (BENS)
- Business Recovery Managers Association (Northern California)
- Kentuckians for Better Transportation
- National Fire Protection Association (including NFPA 1600)
- Oregon Partnership for Disaster Resilience
- Supply Chain Risk Leadership Council

CLOSING

This paper provides a profile of three stakeholder groups who share important responsibilities for freight transportation and emergency management in the United States. Hopefully, the information in the paper and the links and suggestions for additional information will help improve communication and interaction among the three groups.

Most of the paper describes the stakeholders separately without much comparison of institutional arrangements, resources, business processes, operating procedures, decision-making processes, or other characteristics and paradigms. Awareness of such differences and similarities is also important for improved communication. To illustrate, Table 32 is from a recently completed National Cooperative Freight Research Program (NCFRP) report, *Public and Private Sector Interdependence in Freight Transportation Market.*

The table highlights six differences in freight decision making between the public and private sectors. According to the NCFRP report, these differences "can make the relationships between the two sectors difficult" because "there is a divergence in attitudes, processes, scale, geography, timing, and objectives that affect how decisions are made. This is due to fundamentally different roles and responsibilities and differing objectives between the two sectors." (IHS Global Insight 2009)

Table 32. Key Public and Private Sector Differences in Freight Decision Making

Differences	Public Sector	Private Sector
Scale of investment	Entire system within its jurisdiction	One company at a time but international
Geography	U.S. political boundary	Global market
Process of reaching decisions	Collaborative	Hierarchical
Planning horizon and timing	Longer-run, slower	Shorter-run, quicker
Objectives of decisions	Social and political as well as economic development	Increase shareholder value through higher profits/revenues
Attitudes	Attempts to address all stakeholder concerns	Satisfy owners, customers and employees

Source: *Public and Private Sector Interdependence in Freight Transportation Markets* (IHS Global Insight 2009)

It is also hoped that this paper will facilitate more in depth examination of such differences, as well as shared objectives, among the public and private sector agencies responsible for transportation and the public agencies responsible for emergency management.

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