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# Chapter 1

## An Introduction to Highways and Transit

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# An Introduction to Highways and Transit

There are four principal elements of the Nation's surface transportation network—highways, transit, railroads, and ports and waterways. This chapter examines highways and public transit, which form the foundation of one of the most extensive and complicated transportation networks in the world. It defines the functions these two modes of transportation perform, and the ways they complement one another. Finally, this chapter describes the evolution of the Federal role in providing highway and transit infrastructure.

## The Essential Functions of Highway and Transit Infrastructure

There are several critical ways that highways and transit infrastructure interact to provide service for the American people.

### Personal Mobility

Highways and public transit provide the American people with a high degree of personal mobility. Convenience and accessibility are the key elements of the surface transportation network in the United States and Americans have come to expect this ease of transportation. Freedom of movement has been a defining theme in American history, and many of the Nation's social, governmental, and legal principles were built around the concept of mobility.

On the highway system, automobiles allow people to travel where they want, when they want, and with whom they want. Automobile travel is the most popular form of personal transportation. The 2001 National Household Travel Survey (NHTS) found that there is nearly one vehicle (0.97) for every person 16 years and older in the United States. The NHTS also found that 87 percent of daily trips were taken by personal vehicle. In the United States, the highway network is the principal mode of choice for the vast majority of personal travel.

**What are some challenges in ensuring that the Nation's highways, bridges, and tunnels are secure from terrorist threats?**

Q&A

Many of the qualities of the Nation's highway system described in Chapter 2 of this report make it vulnerable to terrorist threats, namely that it is vast, open, and accessible. Additionally, much of the Nation's infrastructure is owned and operated by State and local governments, and a small percentage is privately owned. These owners are primarily responsible for implementing effective security strategies with support from the Federal government. Some of the most effective security strategies—such as retrofitting existing structures—can be very expensive.

The ultimate challenge is to “harden” or retrofit existing structures and design new structures to handle terrorist-induced loadings. Today, the necessary technology either does not exist or is at a very premature stage; further, highway infrastructure varies in design and location. There is no “one size fits all” solution.

Transit also enhances personal mobility. The 2001 NHTS estimates that 43 percent of transit riders live in households with incomes of less than \$20,000 and that 44 percent come from households without cars.

Transit helps people without cars take advantage of a wider range of jobs and educational opportunities, and access health care and other vital services.

Transit use is not, however, limited to those who cannot afford private automobiles. Many people who use transit are choice riders who come from households that own cars, but prefer transit for certain trips because it offers a more convenient and less expensive alternative. A high-quality transit system, in particular, allows people living in dense urban environments to limit their automobile use without sacrificing their mobility.

**What are some challenges in ensuring that the Nation's transit systems are secure from terrorist threats?**

**Q&A**

Americans take more than 10.3 billion transit trips each year. With such high concentrations of people in small spaces, transit systems in the United States are a target for terrorists as they have been globally. Because transportation systems must remain accessible, convenient, and inexpensive for the traveling public, the transit industry and the Federal government must employ innovative ways to prevent terrorist activity in the Nation's transit systems.

## Commercial Freight Transportation

The Nation's surface transportation system plays an essential role in moving freight. While railroads move a substantial amount of the country's freight, most goods are moved by truck over the Nation's highways. According to the Federal Highway Administration's (FHWA's) Freight Analysis Framework, trucks carried over 60 percent of the weight and two-thirds the value of all goods shipments in 2006.

American consumers rely on the freight network to receive finished products, and businesses in every sector of the domestic economy depend on raw materials and supplies moved over the Nation's highways. Increasingly, the Nation's international competitiveness is linked to the performance of its freight network—how efficiently goods can be moved between ports and distribution points in the Nation's interior. Since 1970, imports to the United States have tripled and exports have doubled, when measured against the value of the Gross Domestic Product.

The Nation's trade with other countries is changing. While the countries of Western Europe remain strong trading partners, there is increasing commerce with Canada, Japan, Mexico, and rapidly growing Asian nations such as China and India. As commerce grows with more distant countries, the length that shipments must travel between origin and destination also increases. This makes it even more important to efficiently move cargo through seaports and along freight corridors. The Nation's top 20 international freight gateways move more than \$2.6 trillion worth of goods, and many are located in the country's fast-growing urban areas, as estimated in the FHWA's Freight Analysis Framework. As development occurs around these freight gateways, trucks must deal with increased traffic, as well as homeland security requirements.

While the Nation's public transit systems move passengers and not goods, transit can affect the efficiency of the freight network. Providing transit as an option for potential drivers can help to reduce overall traffic volume and free up highway capacity for freight movement.

## Developing Markets and Communities

Transportation plays an essential role in developing new markets and communities. In the Nineteenth Century, waterways and railroads allowed entrepreneurs to access isolated places like the South and West. During the Twentieth Century, paved roads and Interstate highways extended low-cost automobile and truck transportation across the entire continent. Transit broadened the reach of cities by allowing people to commute to central cities along trolley and rail lines.

Today, new trade corridors have the potential to transform undeveloped parts of the country. In the ten years after the enactment of the North American Free Trade Agreement (NAFTA), the U.S. Department of Commerce estimates that total trade between the United States and Canada and Mexico grew by 111 percent. Trade not only generates jobs in manufacturing plants and distribution centers along these corridors, but also leads to new homes and shopping centers as people move to communities where there are jobs.

Transit plays a critical role in developing new markets and communities. Planners have long recognized that corridors with well-functioning transit systems accommodate retailers, restaurants, theatres, and high-density housing development. Over the past two decades, an increasing number of communities have collected around transit lines, hoping to reduce the need for automobile travel and related congestion and environmental impacts.

## National Defense and Homeland Security

Highways and transit systems play an important role in protecting the American public, although in different ways. The Nation's highway system is essential for much of the Nation's military mobilization. During Operations Desert Storm and Desert Shield in the early 1990s, for example, more than 3.5 million tons of combat-related material and supplies for military personnel were moved throughout the United States.

### What is the Federal Highway Administration's transportation security mission?



In collaboration with the Department of Homeland Security/Transportation Security Administration (DHS/TSA), other Federal agencies, States, local governments, and the private sector, FHWA works to secure highway system integrity and performance by providing subject matter expertise, facilitating communications, and coordinating and conducting research and development, technical assistance, and training.

### What is the Federal Transit Administration's (FTA's) transportation security mission?



The mission of the FTA Office of Safety and Security is to provide leadership and vision in the development and management of programs and initiatives to continually improve the safety and security of passengers, employees, emergency responders, and all others who come into contact with the public transportation system.

The Office of Safety and Security accomplishes its mission through:

- Developing policies, requirements, and guidelines for transit oversight as authorized by Federal statute
- Implementing two Congressionally mandated regulatory programs: Substance Abuse Management and State Safety Oversight of Rail Fixed Guideway Systems
- Developing and overseeing the implementation of strategic long-term FTA safety, security, and emergency management programs
- Managing national safety, security, and emergency management training programs
- Coordinating safety, security, and emergency management plans, programs, and activities within FTA and DOT and with other Federal partners (including DHS) and the transit industry
- Formulating, overseeing, and managing technical assistance and demonstration programs.

This mission includes coordination with TSA on provisions outlined in the legislation Implementing Recommendations of the 9/11 Commission Act of 2007 (HR1).

Highways and transit routes can save lives in an emergency, whether a natural disaster or a terrorist incident. The highway network must have the capability to accommodate police, fire, and rescue vehicles at a moment's notice. Highways and transit lines must also accommodate evacuations. According to the U.S. Nuclear Regulatory Commission, a large-scale evacuation of at least 1,000 people occurred in the United States every three weeks between 1990 and 2003.

## The Complementary Relationship of Highways and Transit

The Nation's surface transportation system is a network of public and private elements that interact to provide service for the American people. Highways and transit are complementary, serving distinct but overlapping markets in the Nation's transportation system. Highways serve both rural and urban communities in the United States, while transit is more widespread in dense urban areas. Investment in both modes of transportation, however, expands travel choices for the American people, allowing them to use the travel options that best meet their needs.

Highway investment not only benefits automobile users, but transit riders as well, since a significant portion of public transportation takes place on the Nation's highways. Buses, vanpools, and demand response services typically share highways with private automobiles, so better pavement quality and traffic conditions benefit transit operations. Conversely, automobile users may decide to use public transit when there is improvement in transit services, freeing up capacity on highways. Automobile users may also choose more frequent use of transit at times when gas prices increase significantly, making transit a more economical option. Transit can also increase the effectiveness of highways by supporting carpools, and by serving as a backup mode for riders when carpools do not meet their needs.

An area served by both a good road network and effective transit service is likely to be more attractive to companies than one served by transit or highways alone. Good highway access to transit stations in outlying areas—such as park-and-ride lots—increases the accessibility of transit and expands its use to a broader group of people than would be possible if access were limited to walking, biking, or other modes of public transportation. According to the 2001 NHTS, over 3.4 billion vehicle trips are made annually to access other modes of transportation.

