

CHAPTER 1

The Role of Highways and Transit

The Role of Highway Transportation.....	1-2
Personal Mobility	1-3
Freight Movement.....	1-3
The Role of Transit	1-3
Basic Mobility and Expanded Opportunities.....	1-4
Broader Transportation Choices.....	1-4
Economic Growth and Development.....	1-4
Environmentally Friendly and Safe Communities.....	1-4
The Complementary Roles of Highways and Transit	1-6
The Evolving Federal Role in Surface Transportation.....	1-6

The Role of Highways and Transit

The typical U.S. resident may consciously consider transportation only when he or she faces an obstacle to his or her safety and mobility: That unexpected accident that delays the single parent in picking up his or her children from the day care center; the business proposal that is mistakenly delivered a day after the deadline causing the company to lose 10 percent of its annual profit; the pothole, obscured by a sudden rainfall, that flattens the commuter's tire; the transit vehicle that does not adhere to its published schedule when the jobseeker needs to arrive on time for the interview; or the sad news that the teenage son of a neighbor has been injured in a car accident.

Such obstacles often present a direct but temporary negative impact on individuals. But transportation, on the whole, serves as an often-overlooked asset for both individuals and the Nation. America's transportation system, despite its imperfections, is the essential element facilitating the movement of goods and people within the country. It forms the generally unheralded backbone of local, regional, national, and international trade, making most economic activity critically dependent upon this resource. The Nation's urban, intercity, intrastate, and interstate transportation systems bring America's cities, States, and regions together, linking farmers and manufacturers to markets, raw material suppliers to processors, businesses to clients, and tourists to recreational and cultural destinations.

These transportation functions are served by a wide variety of modes. Airways and airports provide rapid, long-distance transportation services for travelers and freight, such as mail. On the surface, freight moves by water, rail, highways, and pipelines, while people move by passenger rail, buses, ferries, and private vehicles.

The surface transportation system serving the United States today reflects investment and location decisions made by both governments and private enterprise since the beginning of the Nation. Early settlement and transportation patterns were determined primarily by geography, with waterborne and horse-drawn transportation the dominant modes. Over the years, technological improvements and investments have greatly expanded both the speed and flexibility of transportation movements, allowing economic activity to concentrate in cities and spread more freely across the country.

The Role of Highway Transportation

Highways form the backbone of America's transportation system, connecting all regions and States to one another. Moving people and goods across this network is critical to meeting the everyday needs of our Nation's people. Highway transportation depends on both public and private inputs and investment. In the United States, most vehicles used on highways are owned and operated by private individuals and firms, while most highway infrastructure is funded and maintained by the public sector. This stands in contrast to freight railroads, where both vehicles and infrastructure are owned and operated by private firms, and to mass transit, which is generally owned and operated by public agencies, directly or through contracted private operators. Understanding this dual nature of highway travel is important in understanding how public policy affects the efficient use of the highway network.

Highway transportation in the United States plays a significant role in two major areas: providing personal mobility to households and facilitating freight movement.

Personal Mobility

The use of private automobiles on our large highway network provides Americans with a high degree of personal mobility. Automobile transportation allows people to travel where they want, when they want, and with whom they want. The freedom accorded by autos and highways accounts in large part for the enormous popularity of automobile travel. The 2001 National Household Travel Survey (NHTS) found that the average U.S. household owns or has access to 1.9 personal vehicles. The NHTS also found that 87 percent of daily trips were taken by personal vehicle.

Q. Where can I go for more information on highways?

A. The Federal Highway Administration (FHWA) has produced or sponsored numerous reports and publications regarding surface transportation in general and Federal transportation programs in particular. Some of these publications include:

- *Financing Federal-aid Highways*

<http://www.fhwa.dot.gov/reports/finfedhy.htm>

- *Highway History Web Site*

<http://www.fhwa.dot.gov/infrastructure/history.htm>

- *America's Highways 1776-1976*

Update to be published by FHWA in early 2006

- *Highway Statistics*

<http://www.fhwa.dot.gov/policy/ohpi/hss/index.htm>

- *Freight Transportation and Highways*

<http://www.ops/fhwa.dot.gov/freight/index.cfm>

- *The Federal Role in Surface Transportation - A Report of a Public Policy Forum*

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- *Title 23, United States Code, Highways*

<http://www.access.gpo.gov/uscode/title23/title23.html>

Freight Movement

Highways are the keystone of the U.S. freight transportation system, and the national economy supported by that system. Trucks carried 71 percent of the 15 billion tons of goods shipped in 1998, and accounted for about two-thirds the value-added to the economy by all transportation services. Trucks provide direct service for both long-distance and local shipments, as well as local pickup and delivery for long-distance shipments by other modes. Trucks will play an increasingly important role as businesses depend increasingly on just-in-time delivery systems to minimize logistics costs and improve responsiveness to customers.

The Role of Transit

Transit plays a vital role in enhancing productivity and the quality of life in the United States. It provides basic mobility and expanded opportunities to people without the use of a car; it provides broader transportation choices to people with cars, as well as reduced travel times and road congestion in major transportation corridors. It also facilitates economic growth and development, and supports environmentally sustainable and safe communities.

Basic Mobility and Expanded Opportunities

Transit provides basic mobility to people with limited incomes and without cars. The 2001 NHTS found that 43 percent of nationwide 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 job and educational opportunities, and to obtain the health care that they require. It also enables them to be more active members of their communities and to build and maintain social relationships with family and friends.

Broader Transportation Choices

Many of the people who use transit are choice riders. These people come from households with incomes sufficient to own a car and use transit because it offers them a more convenient, reliable, and less expensive transportation alternative. Some live in a densely developed area with highly accessible and frequent transit service or in a suburb with access to a transit system that offers a cheaper, more comfortable, or more convenient way of traveling to and from a downtown city center.

Q. Where can I go for more information on transit?

A. The Federal Transit Administration (FTA) produces and sponsors numerous reports and publications on transit issues. These publications include:

- *Annual Report on New Starts*

<http://www.fta.dot.gov/library/policy/ns/ns2005/nscover.html>

- *Statistical Summaries-Grants Assistance Programs*

http://www.fta.dot.gov/transit_data_info/reports_publications/publications/statistical_summaries/15972_ENG_HTML.htm

- *National Transit Summaries and Trends*

<http://www.ntdprogram.com/NTD/ntdhome.nsf/Docs/NTDPublications?OpenDocument#>

- *The Benefits of Transit 2000*

http://www.fta.dot.gov/transit_data_info/reports_publications/reports/transit_benefits_2000/2262_2253_ENG_HTML.htm

- *The Transit Performance Monitoring System*

http://www.fta.dot.gov/16053_ENG_HTML.htm

- *Title 49, United States Code, Section 53, Mass Transportation*

<http://www.fta.dot.gov/library/legal/49uscc53.html>

Economic Growth and Development

Private sector development gravitates to location efficient areas offering accessible and frequent transit services. This development in turn leads to increased employment opportunities and higher property values. Higher density housing and attractive retail, entertainment, and business options create thriving communities in transit corridors.

Environmentally Friendly and Safe Communities

Transit helps the Nation and communities protect the environment, conserve energy, and ensure the safety and security of our citizens. Each trip that is shifted from a car to a transit vehicle helps to reduce automotive emissions and meet local air quality goals. Transit is also available and can be used to cope with natural or man-made emergency situations, transporting emergency workers to the scene, evacuating people from the affected area, and even serving as temporary shelters and medical shelters.

Q. Where can I find more information about trends in travel behavior?

A. The *National Household Travel Survey* (NHTS) is the nation's inventory of personal travel, both daily and long-distance. The survey collects demographics on households and people, detailed information on daily and long-distance trips for all purposes, use of household vehicles, and public attitudes about various transportation issues. The 2001 NHTS report may be found at <http://nhts.ornl.gov/2001/index.shtml>. Some findings from the 2001 NHTS include:

- **Trip lengths continue to increase.** Average vehicle trip lengths had remained in the 8- to 9-mile range between 1969 and 1995, but increased to 9.9 miles in 2001.
- **Time spent driving is also on the rise.** Since 1990 the average time spent behind the wheel is up from 49 minutes a day to 61, a 24 percent increase. While congestion has worsened over that period, some of that additional time was spent in traveling additional miles.
- **Transit principally serves those who can access it easily.** In 2001, 65 percent of transit passengers using transit as their primary mode of travel were able to access transit within 5 minutes of starting their trip.
- **The number of daily trips has remained essentially unchanged in recent years.** Average daily person trips per person grew from 2.0 in 1969 to 4.3 in 1995, with leveling off to 4.1 in 2001. Daily vehicle trips per driver increased from 2.3 in 1969 to 3.6 in 1995, with a similar leveling off to 3.4 in 2001.
- **Trip chaining is a significant consideration.** Approximately 20 percent of all workers chain trips (i.e., make stops, such as child care drop-offs, on their way to and from work). This phenomenon impacts travel mode, route, and travel time and often dictates departure time.
- **Vehicle ownership continues to rise.** Between 1983 and 1995, the number of household vehicles and the number of licensed drivers were almost the same. By 2001, almost 9 million households were without a vehicle, but over 22.7 million U.S. households, or 21.2 percent, had more vehicles than drivers, resulting in 12 million more vehicles than licensed drivers.
- **A large percentage of transit trips are by people without cars.** In 2001, 44 percent of the people who used transit for their principal mode of travel on their day trip were from households without cars.
- **Commuting to work has decreased relative to other trip purposes.** Travel to and from work continues to decrease as a proportion of all travel, as trips rise for purposes including shopping, household errands, and recreational activities.
- **Walking is still a significant mode of travel.** Americans spend 15 percent of their daily travel time in non-privately-owned vehicle (POV) modes, primarily walking.
- **Vehicle occupancy rates have stabilized.** The huge growth in vehicle ownership and the changes in the mix of trip purposes resulted in a steady decline from 1969 in average vehicle occupancy of 2.2 person miles per vehicle mile. However, the figure remained consistent at 1.6 person miles per vehicle mile in 1995 and 2001.
- **Transit is particularly important to people with limited incomes.** In 2001, 43 percent of all transit users lived in households with incomes of less than \$20,000.

Chapter 14 includes additional information on transit ridership characteristics drawn from the 2001 NHTS, and from the Transit Performance Monitoring System based on on-board survey information collected directly from 30 transit systems.

The Complementary Roles of Highways and Transit

Highways and transit serve distinct but overlapping markets in our national transportation system and complement each other in many ways. For example, bus transit systems rely upon roads to move their passengers. Transit may serve the basic mobility needs of riders for whom car ownership is not a viable option, while highways and autos may best meet the needs of residents and firms whose trip patterns are not readily met by transit. The needs of all citizens are best served by access to both high-quality transit and high-quality highways.

Investment in highways and transit expands people's travel choices and allows them to choose what best meets their needs. A high-quality transit system gives people who prefer living in a dense, urban environment the opportunity to do so without sacrificing their mobility. An adequate highway network does the same for people who prefer a suburban lifestyle. Highways provide people with their principal means of intercity travel and shippers with an alternative to rail and air and the means to reach the majority of final destinations for shipments in the Nation, which are accessible by no other means.

Highway investment benefits both transit operations and auto users. Buses, vanpools, and demand response services typically share roadways with private autos and, hence, are affected by highway pavement and traffic conditions. Conversely, transit improvements attract private vehicle drivers, freeing up road capacity. Transit can also increase the effectiveness of highways by encouraging and supporting carpooling, and as a backup mode for riders in both formal and informal arrangements when carpools don't meet their needs.

Highway investment encourages transit usage and improves operating efficiency. An area served by both a good road network and good transit service is likely to be more attractive to firms than one served by transit or highways alone. Good accessibility by road near transit stations facilitates transit use. Good highway access to transit stations in outlying areas, coupled with sufficient parking capacity, 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 transit modes.

The Evolving Federal Role in Surface Transportation

The success of our transportation network is fundamental to America's economic growth and well-being. Over the years, from the early postal roads to the highway and transit networks that we have today, America has demonstrated a long-standing public commitment to transportation. State and local governments and businesses are full partners in the development and operation of our transportation system, with the Federal government balancing diverse needs and interests in order to systematically and cohesively address

Q. How are tradeoffs and complementarities between highway and transit handled in the investment analyses found in this report?

A. While the complementary and alternative roles that highways and transit play in our surface transportation system are relatively easy to identify, they are much more difficult to quantify analytically. The investment analyses presented later in this report are based on separate methodologies for highways and transit. Multimodal analysis issues, and the challenges that FHWA and FTA face in attempting to develop an integrated approach to modeling transit and highway investments, are discussed in the Introduction to Part II and in the Afterword found in Part V of this report.

transportation concerns affecting the Nation as a whole. The Federal government has played a key role in shaping the transportation system, both in regulating interstate commerce and in funding and facilitating transportation improvements. This role has evolved through the years to meet changing needs and priorities. One thing that remains constant, however, is the importance of national leadership— in short-term and long-term transportation decision-making that transcends state boundaries, in ensuring that America's transportation infrastructure supports and enhances our position in the global economy, and in advancing the state-of-the-art technology and practices through high-risk research.

As mandated in law, the Federal-aid highway program is a Federally assisted, State administered program. Federal, State, and local transportation partners work together to deliver the Nation's highway program. As State and local expertise has developed, Congress has increased statutory authority for States to assume certain Federal-aid highway project oversight responsibilities, where appropriate. This in turn frees up Federal resources for programmatic stewardship, research, and deployment of new technologies and methods. As mandated by law, the Federal transit program is a Federally assisted and administered grant program, operated through a program of formula and discretionary grants to urban areas and, through States, to rural communities. As grantee experience has developed, the focus of the Federal government has shifted from the formula to the discretionary programs. The New Starts Program, providing funds to metropolitan areas for the construction of new fixed guideway systems or extensions to existing systems, is the largest FTA discretionary program. The FTA works closely with grantees to ensure that these projects meet a full range of criteria for both project justification and local financial commitment. The FTA also evaluates projects from their initial consideration to final grant award, and continues to monitor them through construction and operation.

In order to meet the Nation's increasing, and increasingly complex, transportation infrastructure needs and demands, FHWA and FTA continue to explore innovations in financing and technology. For example, the Highways for Life initiative will accelerate the integration of proven innovations into routine practice by demonstrating and promoting the use of elevated performance standards, state-of-the-art tools and technologies, and new business practices in the highway construction process to achieve improved safety, reduced congestion from construction, improved quality, and faster construction. Financial innovation is increasingly focusing on the potential role of the private sector in transportation infrastructure innovation and investment. Leveraging Federal investments through public-private partnerships (including joint development around transit stations), other innovative financing techniques, value pricing and high-occupancy toll (HOT) lanes are a few of the initiatives that will expedite project completion, cost savings, and improve system performance.

FHWA and FTA provide leadership and expertise to States in transportation planning, to ensure that transportation decisions are made in an environmentally sensitive way, using a comprehensive planning process that includes the public and considers land use, development, safety, and security. National leadership is also provided in asset management principles. Asset management is a systematic approach to maintaining, upgrading, and operating physical assets cost-effectively, and provides a framework for handling both short- and long-range planning decisions. FHWA also provides leadership in establishing national standards for ITS technology; preventing fuel tax evasion; facilitating the flow of goods at borders and trade gateways, and building and maintaining roads on Federal lands.

The FTA has developed the Lessons Learned Program to increase the effectiveness of transit capital investment by facilitating a way for transit operators to share their experiences in undertaking these projects. This program is part of FTA's Project Management Oversight Program, which actively oversees capital

investment projects receiving FTA funds to ensure that they are on time, within budget, and conform to the grantee's approved plans and specifications, and are efficiently and effectively implemented.

This report focuses on the infrastructure quality and operating characteristics of highways (and their component bridges) and transit (including buses and urban rail). These two modes are closely linked in their function and funding sources. The FHWA and FTA work closely with each other and other Federal, State, and local agencies, and other partners to maximize the benefits of the public investment in highways and transit, and to prepare to meet America's future transportation needs.