America's Rolling Warehouses

The impact of increased trucking on economic development, congestion and traffic safety

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Founded in 1971, The Road Information Program (TRIP) ® of Washington, DC is a nonprofit organization that researches, evaluates and distributes economic and technical data on highway transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway engineering, construction and finance; labor unions; and organizations concerned with an efficient and safe highway transportation network.

Executive Summary

The completion of most of the Interstate highway system by the early 1980s along with the 1980 deregulation of the U.S. trucking industry contributed to a large increase in commercial trucking, which has improved business productivity and supported a significant expansion of the U.S. economy.

But growing traffic congestion threatens to erode some of the benefits of the productivity gains that U.S. businesses and consumers have enjoyed as a result of more efficient freight delivery. The significant increase in commercial trucking also poses a traffic safety challenge as accidents involving large trucks are more likely to result in fatalities than other accidents and the share of large trucks on the roads is increasing as large truck travel continues to increase faster than travel of other vehicles.

This report looks at past, current and projected levels of commercial trucking and the impact of growing traffic congestion on the efficiency of the nation's economy. The study also reviews truck safety in the U.S., based on an analysis of National Highway Traffic Safety Administration data of all traffic fatalities in crashes involving large trucks from 1998 to 2002.

This study also looks at what some regions are doing to improve trucking efficiency and large truck safety and concludes with a set of recommendations to safely meet the nation's increasing demand for freight delivery.

Key findings of the report include:

The advent of modern national and global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, which has allowed U.S. businesses to adopt more efficient logistics practices, which have made them more efficient and competitive.

- The cost of moving freight dropped from 16 percent of U.S. Gross Domestic Product (GDP) in 1980 to approximately 10 percent in 2000.

- Businesses have responded to improved communications and greater competition by moving from a push-style distribution system, which relies on low-cost movement of bulk commodities and large-scale warehousing to a pull-style distribution system, which relies on smaller, more strategic and time-sensitive movement of goods.

- International trade, which requires the movement of goods to and from U.S. ports, continues to increase its share of overall U.S. commerce. U.S. merchandise trade has grown from 11 percent of U.S. GDP in 1970 to 25 percent in 1997 and is forecast to reach 37 percent of GDP by 2025.

- Over 15 billion tons of goods, worth over $92 trillion, are moved annually in the U.S. -- the equivalent of 310 pounds of freight being moved daily for each U.S. resident.

- The largest share of the nation's freight is moved by trucks, which carry 71 percent of all tonnage and 80 percent of the value of U.S. shipments.

- A University of California study has found that distribution centers are increasingly moving to areas that have ample land, labor and access to less congested highways.

The amount of commercial truck travel in the U.S. is increasing faster than all other vehicle travel and is expected to increase significantly by 2020.

- Travel by combination vehicles, the dominant vehicle for large-scale freight movement, more than doubled, increasing from 102 percent from 1980 to 2002, compared to an increase of 87 percent in total national vehicle miles of travel during the same period.
- The total tonnage that will be shipped by trucks in the U.S. is expected to increase by nearly 50 percent (49 percent) from 2003 to 2020, according to estimates by the U.S. Department of Transportation.
- TRIP estimates that the five states with the greatest tonnage of materials being transported by trucks in 2003 were California, Texas, Ohio, Illinois and Pennsylvania, based on data from the U.S. Department of Transportation.
- Among highly populated states (6 million population or higher), the largest increases in trucking by 2020 are expected in: Georgia, a 59 percent increase; Washington State and North Carolina, a 57 percent increase; Florida, a 56 percent increase and Texas, a 55 percent increase.
- Among mid-sized states (3 to 6 million population), the largest increases in trucking by 2020 are expected in: Arizona, a 78 percent increase; South Carolina, a 61 percent increase; Oregon, a 60 percent increase; Minnesota, a 58 percent increase; and Louisiana, a 56 percent increase.
- Among less-populated states (less than 3 million population), the largest increases in trucking by 2020 are expected in: Nevada, an 85 percent increase; Utah, an 82 percent increase; Montana, a 77 percent increase; Idaho, a 74 percent increase; and New Mexico, a 71 percent increase.

Increasing levels of traffic congestion are a threat to the competitiveness of U.S. businesses, which have improved their efficiency by moving to a logistics process that relies on a high level of reliability in the timing of freight movement. A comprehensive 2002 report from the Transportation Research Board concludes that worsening traffic congestion will likely reduce the efficiency and competitiveness of some U.S. businesses. The report also found that some U.S. businesses are expected to respond to increasing congestion by moving some facilities to less-congested parts of the U.S. or to other countries.

- While the travel of combination trucks increased by 102 percent from 1980 to 2002, the total lane miles of public roads in the U.S. increased by only 4 percent.
- The Texas Transportation Institute (TTI) reports that urban traffic delays have tripled in the nation's largest urban areas from 1982 to 2001. TTI reports that the additional time needed to complete an urban trip at rush hour has increased from 13 percent in 1982 to 39 percent in 2001.
- The Federal Highway Administration (FHWA) estimates that 46 percent of the nation's urban major highways will be congested during peak periods, by 2020, compared with 28 percent in 1998.
- The FHWA also estimates that the percentage of urban Interstates, which will carry at least 10,000 large trucks per day, will increase to 69 percent by 2020, compared to 27 percent in 1998.

Traffic accidents involving large trucks (gross vehicle weight greater than 10,000 pounds) are responsible for one-out-of-eight traffic fatalities nationally. Accidents involving large trucks are more likely to result in fatalities than accidents between other vehicles.

- Large trucks account for four percent of the vehicles in non-fatal traffic accidents and eight percent of the vehicles in fatal traffic accidents, but these fatal accidents result in 12 percent of traffic fatalities.
- Approximately one-out-of-eight of the 210,174 traffic fatalities that occurred from 1998 to 2002 in the U.S. were a result of an accident involving a large truck.
- There were 26,065 people killed in crashes involving large trucks in the U.S. from 1998 to 2002, including 3,647 occupants of large trucks and 22,418 people who were occupants of passenger vehicles or non-motorists. Approximately 4,500 people (4,484), excluding large truck occupants, were killed annually in accidents involving large trucks from 1998 to 2002.

- The five states with the largest number of people killed in traffic accidents involving large trucks, excluding large truck occupants, from 1998 to 2002, were: Texas with 2,043 fatalities (409 annual average), California with 1,574 fatalities (315 annual average), Florida with 1,568 fatalities (314 annual average), Georgia with 968 fatalities (194 annual average) and North Carolina with 868 fatalities (174 annual average).
- In fatal accidents between large trucks and smaller vehicles, the occupants of the smaller vehicle, largely passenger cars and trucks, are much more likely to be killed. In fatal two-vehicle accidents between a large truck and another vehicle from 1998 to 2002, there were 347 deaths of large truck occupants and 15,955 deaths of occupants of other vehicles. Thus there were 46 deaths among occupants of other vehicles for every one fatality of a large truck occupant in such accidents.
- Approximately three-quarters (77 percent) of traffic fatalities involving large trucks from 1998 to 2002 occurred on roads with two lanes and 15 percent occurred on roads with at least four lanes.
- Approximately two-thirds (68 percent) of fatalities from crashes involving large trucks from 1998 to 2002 occurred on rural roads.
- Nearly three-quarters (73 percent) of traffic fatalities involving large trucks from 1998 to 2002 occurred on roads with a posted speed limit of at least 55 miles per hour.

The drivers of passenger vehicles are far more likely than the driver of a large truck to be at fault in a fatal accident between a passenger vehicle and a large truck.

- An AAA Foundation for Traffic Safety study of fatal, large truck-passenger vehicle accidents between 1995 and 1998 found that when improper following or improper lane changes were a contributing factor, the passenger vehicle driver was in error three-quarters of the time and the large truck driver was in error one quarter of the time. The study also found that when driver fatigue was a factor in a fatal large truck-passenger vehicle accident, the passenger vehicle driver was at fault 87 percent of the time and the large truck driver was at fault 13 percent of the time.
- A National Center for Statistics and Analysis report on large truck-passenger vehicle accidents from 1996 to 1999 found that deaths in these accidents were nine times more likely to be caused by a passenger vehicle having entered the oncoming lane than as a result of a large truck having entered the oncoming lane. The study found that in accidents that were caused by one vehicle entering the oncoming lane of the other vehicle, 90 percent of the fatalities were as a result of a passenger vehicle having entered the oncoming lane and that 10 percent of the fatalities had occurred as a result of a large truck having entered an oncoming lane.

- Drivers of large trucks involved in a fatal accident are much less likely than the driver of a passenger vehicle involved in a fatal accident to be intoxicated. The percentage of large truck drivers involved in a fatal crash, who were intoxicated – with blood alcohol concentrations of .08 grams per deciliter or greater – was 2 percent in 2002, compared with 22 percent of passenger car drivers involved in fatal crashes in 2002 and 23 percent of light truck drivers involved in fatal crashes in 2002.

Increasing traffic congestion, which slows the delivery of freight, and concerns about traffic safety have spurred many areas to begin studying significant improvements in their transportation that will accommodate increased freight shipments.

- Virginia is currently studying proposals to expand or build truck-only lanes along the 325-mile portion of Interstate 81 in Virginia.

- The eight states traversed by Interstate 10, which goes from Los Angeles to Jacksonville, Florida are looking at the need to add capacity along the corridor to accommodate the anticipated increase in large truck and commercial travel. The addition of truck-only lanes along some portions is considered a feasible option.

- Washington state and Oregon are working together on a plan to expand highway, bridge and rail capacity along the I-5 corridor from downtown Portland to north of Vancouver, Washington.

- In Seattle, numerous projects have been completed to improve the efficiency of truck shipments in the Puget Sound region, largely by building overpasses at many rail/roadway crossings. A second round of improvements is planned in the region.

- Five Mid-Atlantic States are studying a major improvement in rail infrastructure, mostly along the Interstate 95 corridor, to allow increased freight rail service to accommodate some the region's increased freight delivery needs.

The establishment of national freight policy to guide the improvement of the nation's freight transportation system would be helpful in allowing the U.S. to safely and efficiently accommodate future growth in the demand for freight movement. TRIP offers the following proposals for improving freight delivery:

- **Additional highway capacity.** Most additional roadway capacity that is likely to be provided is in the form of widening of existing roadways, improved alignments and improved intersections and interchanges, which will allow the movement of additional traffic.

- **Car-truck separation.** The construction of truck-only lanes, largely along existing highways, offers significant safety and congestion benefits. Truck only lanes are most feasible in areas with significant traffic congestion or an increasing truck/car mix.
- **Additional rail capacity.** While the flexibility of truck travel will continue to favor truck over rail for most goods shipments, improvements in the nation's rail infrastructure, particularly in some highly congested corridors, may be helpful in accommodating some of the increased demand for freight movement.
- **Roadway operations.** Improvements to make highways operate more efficiently, such as electronic tolling, improved accident/incident management, ramp metering and improved driver information can help relieve traffic congestion.
- **Road safety improvements.** Safety improvements, particularly on two-lane rural roads, would be very helpful in reducing large truck/passenger vehicle accidents. Improvements such as the construction of passing lanes, making lanes wider, reduced curves, better intersection design and improved markings and lighting would likely reduce the number of serious large truck/private vehicle accidents.

The long-term reauthorization of federal surface transportation legislation offers an opportunity for a significant increase in funding for improvements that would help safely accommodate the anticipated growth in trucking.

- The current federal surface transportation program, the Transportation Efficiency Act of 1998 (TEA-21) expires on February 29, 2004.

- The Administration's bill has been introduced in the House and Senate, and calls for $247 billion in spending over six years. The Senate bill mandates spending $311 billion over six years, while the House bill sets spending at $375 billion over the life of the legislation (2004 – 2009). Both the Senate and House bills have been introduced, but not enacted.

- The House proposal includes funding earmarked for adding truck lanes to key highways, improving road connections to key air, rail and water ports and for rural road safety improvements. The House bill includes $1.5 billion for building truck lanes, $3 billion for improving road connections to and from freight facilities and $1.5 billion for rural road safety improvements. The House bill also includes the establishment of a program to improve planning of regional freight transportation facilities.

Introduction

The continued increase in commercial trucking has provided Americans with a high standard of living and a staggering diversity of options from the food we eat to the products available in local stores. Modern society is likely to become even more reliant on trucking and other types of shipments as international trade continues to increase, offering additional opportunities and choices to businesses and consumers.

In fact, a comprehensive new report from the Federal Highway Administration concluded that "as international trade increases and the global economy becomes more integrated, transportation will take on an even more prominent role in the U.S. economy and society."[1]

But as the number of large trucks on the nation's roads and highways increase, concerns about traffic congestion and traffic safety are being raised at the same time that the demand for the delivery and movement of goods continues to increase. Balancing the need for increased freight movement with the concern to accommodate the need for increased trucking without causing more traffic congestion or reducing traffic safety has become an important challenge.

This report looks at trends in commercial trucking and the factors that influence these trends. The study also looks at the relationship between trucking and traffic congestion as well as the impact of trucking on highway safety. Finally, the report looks at the experience of different regions attempting to improve the safe movement of freight in

their communities and solutions to safely accommodating the increased demand for commercial trucking and other freight deliveries.

Sources of information for this study include the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), the Texas Transportation Institute (TTI), the National Center for Statistics & Analysis, the Transportation Research Board and the AAA Foundation for Traffic Safety.

Importance of Freight Movement to Economic Growth

The improved efficiency of the nation's freight transportation system has played an important role in the growth and increased competitiveness of the U.S. economy. The deregulation of the U.S. trucking industry in 1980, along with the near completion of the Interstate highway system in the 1980s, resulted in a significant improvement in the competitiveness of U.S. businesses. In fact, the cost of moving freight dropped from 16 percent of U.S. Gross Domestic Product (GDP) in 1980 to approximately 10 percent in 2000.[2]

Over 15 billion tons of goods, worth over $92 trillion, are moved annually -- the equivalent of 310 pounds of freight moved daily for each U.S. resident.[3] The largest share of the nation's freight is moved by trucks, which carry 71 percent of all tonnage and 80 percent of the value of U.S. shipments.[4]

The advent of modern national and global communications and the impact of free trade in North America and elsewhere are resulting in significant increases in freight movement, and consequently, the quality of a region's transportation system increasingly is a key component in a business' ability to compete locally, nationally and internationally.

International trade, which requires the movement of goods to and from U.S. ports, continues to increase its share of overall U.S. commerce. U.S. merchandise trade grew from 11 percent of U.S. GDP in 1970 to 25 percent in 1997 and is forecast to reach 37 percent of GDP by 2025.[5]

The tremendous increase in freight delivery is partly fueled by improved communications and the need for greater competitiveness. Improved communications provided by the Internet are integrating producers, wholesalers, retailers and consumers. Businesses have responded to improved communications and the necessity to cut costs with a variety of innovations including just-in-time delivery, an increased demand for small package delivery, demand-side inventory management and by accepting customer orders through the Internet.

The result of these changes has been a significant improvement in logistics efficiency as firms move away from a push-style distribution system, which relies on large-scale warehousing of materials to a pull-style distribution system, which relies on smaller, more strategic movement of goods.[6] While the nation's economy had depended on low-cost movement of bulk commodities, it increasingly requires the movement of high cost goods with a high level of reliability, and fast movement of smaller, more specialized goods.[7] The recent improvements in the nation's logistics system have made

mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

A recent report published by the University of California has found a critical shift is occurring in the logistic practices of American producers.[8] The traditional model has been plants located in large urban regions, with adjoining warehouses to store commodities, prior to shipment. But with the significant increase in foreign trade, along with the increased difficulty of locating plants and warehouses in congested and more expensive large urban areas, businesses are moving to large distribution centers to process inbound and outbound shipments. Increasingly, these distribution centers are moving to regions where land is cheaper, sufficient labor is available and most importantly, a less congested system of highways is available. These large centers are responsible for quickly processing incoming commodities and preparing them for delivery on outgoing trucks. The high volume and time sensitivity of these transactions typically require more frequent movement of smaller loads by truck, vans and planes.

The report found that "as better communications brings faster, more reliable, and more efficient handling and movement of goods, competition requires freight companies to be fast, flexible, precise and cost-sensitive."[9]

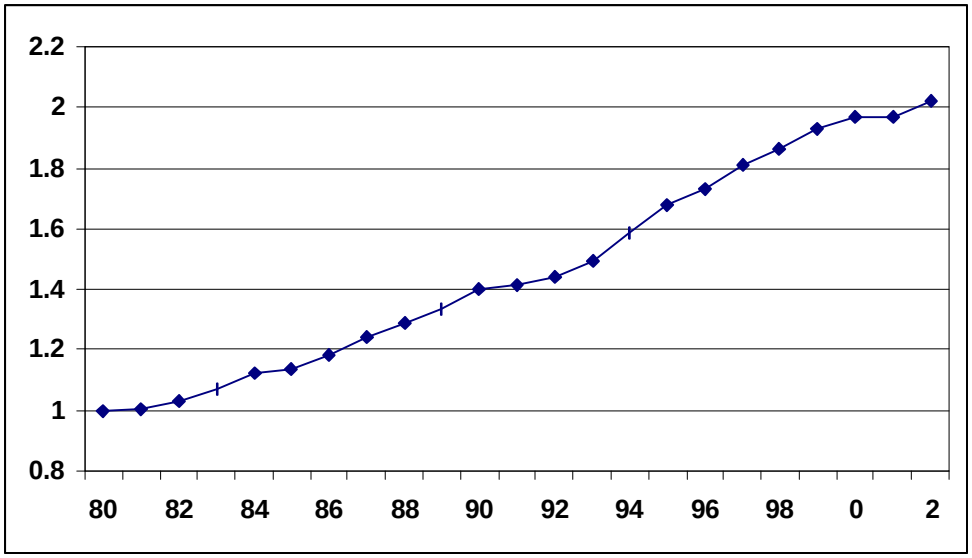
Trends in Large Truck Travel

The level of commercial truck travel continues to increase at a rate faster than all other vehicle travel. Travel by combination trucks is estimated annually by the FHWA. An estimate of the volume of freight movement on highways since 1998 and projected

until 2020 has also been made by the U.S. Department of Transportation, as part of the Freight Analysis Framework. The Freight Analysis Framework was developed to help assess the most productive investment and operation strategies to improve freight delivery in the U.S.[10]

Between 1980 and 2002 travel by combination trucks, the dominant vehicle for large-scale freight movement on highways, increased by 102 percent from 69 billion miles traveled to 139 billion miles traveled, compared to an 87 percent increase in total national vehicle miles of travel from 1980 to 2002.[11]

Chart 1. Increase in vehicle miles of travel of combination trucks, 1980 to 2002 (1 = 1980 level)

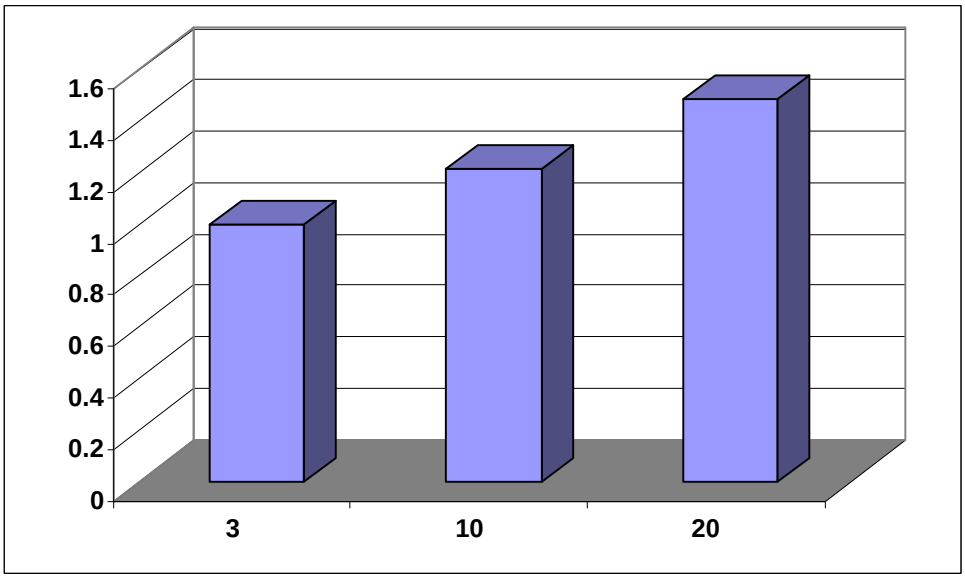


Source: TRIP analysis of Federal Highway Administration data

The U.S. Department of Transportation has estimated the total tonnage of freight that will be shipped within the U.S. (to and from domestic and international destinations) annually from 1998 to 2020, by all modes, including trucking. Based on this analysis, the

total freight tonnage shipped annually in the U.S. by trucks is expected to increase 49 percent between 2003 and 2020, from 12.8 billion tons to 19.2 billion tons.[12]

Chart 2. Increase in tonnage of U.S. freight shipments by truck, 2003, 2010 and 2020 (1 = 2003 level)



Source: TRIP analysis of U.S. Department of Transportation data

TRIP estimates that the five states with the greatest tonnage of materials being transported by trucks within their border in 2003 were California, Texas, Ohio, Illinois and Pennsylvania, based on projections made by the U.S. Department of Transportation.

Chart 3. Five states with the largest tonnage of materials transported by trucks within their borders in 2003, in tons.

CALIFORNIA	1.324 BILLION
Texas	1.206 billion
Ohio	775 million
Illinois	768 million
Pennsylvania	717 million

The U.S. Department of Transportation also estimated the total volume of freight to be transported on highways, by state, for 1998, 2010 and 2020. Among larger states, those with at least 6 million in population, the states with the largest increase in commercial trucking projected by 2020 are Georgia, Washington State, North Carolina, Florida and Texas.[13]

Chart 4. Largest percentage increase in commercial trucking 2003 to 2010, in larger states – states with at least 6 million population

GEORGIA	**59**
Washington	**57**
North Carolina	**57**
Florida	**56**
Texas	**55**

Source: TRIP analysis of Federal Highway Administration data

Among mid-sized states, those with between 3 and 6 million in population, the state's with the largest expected increase in commercial trucking projected by 2020 are Arizona, South Carolina, Oregon, Minnesota and Louisiana.[14]

Chart 5. Largest percentage increase in commercial trucking 2003 to 2010, in mid-size states – states with between 3 to 6 million population

ARIZONA	**78**
South Carolina	**61**
Oregon	**60**
Minnesota	**58**
Louisiana	**56**

Source: TRIP analysis of Federal Highway Administration data

Among smaller states, those with populations below 3 million people, the states with the largest expected increase in commercial trucking projected by 2020 are Nevada, Utah, Montana, Idaho and New Mexico.[15] The expected increase in commercial trucking projected by 2020 can be found in appendix A.

Chart 6. Largest percentage increase in commercial trucking 2003 to 2010, in smaller states – states with less than 3 million people

NEVADA	**85**
Utah	**82**
Montana	**77**
Idaho	**74**
New Mexico	**71**

Source: TRIP analysis of Federal Highway Administration data

Traffic Congestion and Trucking

When traffic congestion worsens, the reliability of freight movement is decreased, which reduces the competitiveness of businesses. Traffic congestion in the U.S. continues to increase as a result of vehicle travel increasing at a rate far in excess of the addition of new roadway capacity. From 1980 to 2002, travel by combination trucks increased by 102 percent, but lane miles of public roads in the U.S. increased by only 4 percent during the same period.[16]

The Texas Transportation Institute (TTI), in its annual report on traffic congestion levels in 75 of the nation's largest urban areas, found that urban traffic delays have tripled from 1982 to 2001. The TTI report found that in 1982 the average trip taken during rush hour took 13 percent longer to complete than during non-rush hours. By 2001, the TTI report found that the average rush hour trip took on average 39 percent longer to complete than during non-rush hour.[17] Similarly, the TTI report also found that the proportion of urban, rush-hour travel that is congested increased from 33 percent in 1982 to 67 percent in 2001.[18]

The FHWA forecasts that the extent of traffic congestion will increase by 2020 and that the number of urban Interstates carrying a significant volume of large trucks will also increase by 2020. The FHWA estimates that 46 percent of the nation's urban major highways will be congested during peak periods, by 2020, compared with 28 percent in 1998.[19] The FHWA also estimates that the percentage of urban Interstates, which will

carry at least 10,000 large trucks per day, will increase to 69 percent by 2020, compared to 27 percent in 1998.[20]

A comprehensive 2002 Transportation Research Board report on the adequacy of U.S. freight movement capabilities found that an increase in traffic congestion is likely to lead to less-efficient logistics practices by businesses, such as shipping more in bulk and holding larger inventories.[21]

The same 2002 Transportation Research Board report also found that a region's ability or failure to relieve traffic congestion and provide reliable freight movement has a significant impact on whether jobs are created locally or are shifted elsewhere, including outside the U.S. The report found that "workplaces and residences will move away from congestion within metropolitan areas and from more congested to less congested regions within the United States. Some production will move from the United States to other countries if congestion costs cause the United States to lose comparative advantage in some industries."[22]

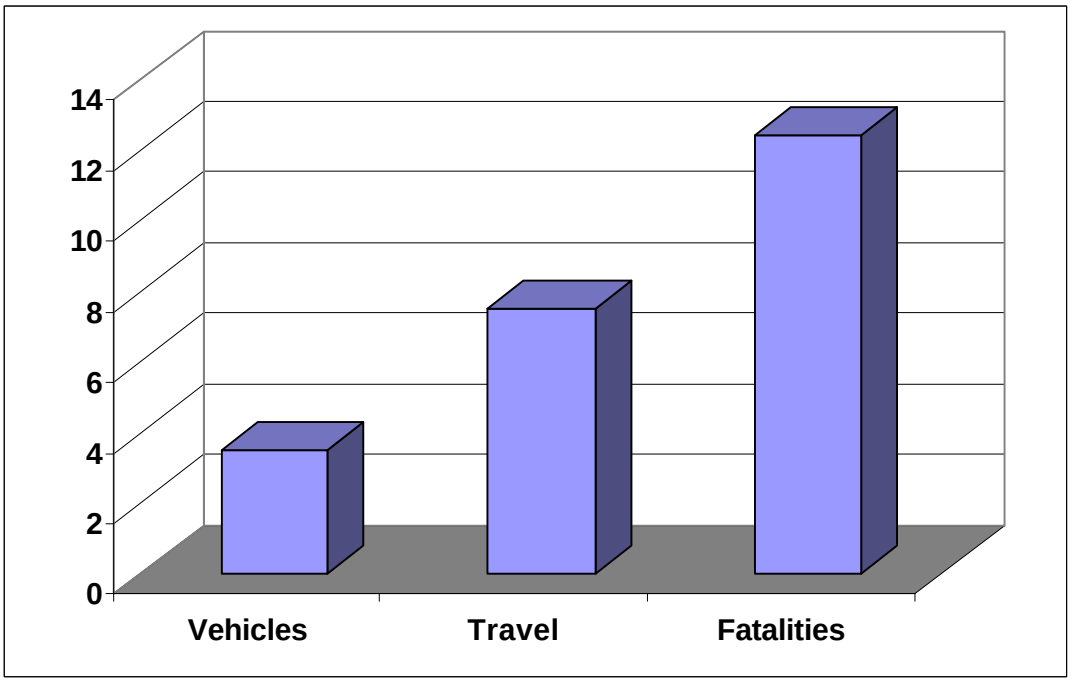
Large Truck Safety

Traffic accidents involving large trucks (gross vehicle weight greater than 10,000 pounds) are responsible for a significant proportion of traffic fatalities annually and accidents involving large trucks are more likely to result in fatalities, due to the more serious consequences of accidents involving larger vehicles.

TRIP analyzed data from the National Highway Traffic Safety Administration on fatal traffic accidents involving large trucks in the U.S. from 1998 to 2002 to gain a better understanding of the characteristics of these accidents. It was found that 26,065 of the 210,174 traffic fatalities that occurred from 1998 to 2002 in the U.S. – approximately one out of eight -- resulted from a collision that involved a large truck.[23] Fatal traffic accidents involving large trucks from 1998 to 2002 resulted in the deaths of 3,647 persons who were drivers or occupants of large trucks and the remaining 22,418 people killed were either drivers or occupants of other vehicles or were non-motorists, such as pedestrians or bicyclists. Thus, approximately six out of seven people killed in fatal traffic accidents involving large trucks were not occupants of a large truck.

Large trucks account for four percent of all registered vehicles and seven percent of all vehicles miles of travel annually. While large trucks account for four percent of the vehicles involved in injury and property-damage-only accidents and eight percent of the vehicles involved in fatal accidents, 12 percent of traffic fatalities annually occur in traffic accidents in which a large truck was involved.[24]

Chart 7. Large truck percentage of total registered vehicles, vehicle miles of travel and fatalities in accidents involving large trucks (1998 to 2002)



Source: NHTSA, TRIP analysis of NHTSA data

When a large truck and a smaller vehicle collide in a fatal traffic accident, the occupant of the smaller vehicle is much more likely to be the person killed. There were 16,302 vehicle occupants killed from 1998 to 2002 in two-vehicle accidents, in which one vehicle was a large truck and the other vehicle was not a large truck. There were 347 deaths among large truck occupants and 15,955 deaths among the occupants of the other vehicle, such as a car, van or smaller truck. Thus, in two-vehicle fatal accidents, where one vehicle was a large truck, there were 46 deaths among occupants of the other vehicles for every one fatality of a large truck occupant.

Several recent reports on fatal large truck accidents have found that the drivers of passenger vehicles are much more likely to be at fault than the drivers of large trucks. In

an analysis of fatal car-truck accidents between 1995 and 1998, a report prepared for the AAA Foundation for Traffic Safety found that car drivers were "far more" likely to be at fault in fatal car-large truck crashes than truck drivers.[25] In fact, the AAA report found that in fatal car-large truck accidents when improper following or improper lane changes were a contributing factor, the car driver was in error three-quarters of the time and the truck driver was in error one-quarter the time. Similarly, when driver fatigue was a factor in a fatal car-truck accident, the car driver was at fault 87 percent of the time and the large truck driver was at fault 13 percent of the time.[26]

A recent report on large truck crashes from 1996 to 1999 by the National Center for Statistics and Analysis also found that passenger vehicle drivers were much more likely than large truck drivers to be at fault in two-vehicle, fatal accidents between a large truck and a passenger vehicle, in which one vehicle had entered the other vehicles' lane. The report looked at fatal accidents between a large truck and a passenger vehicle, in which one vehicle had entered an oncoming lane and either hit the other vehicle head-on or had sideswiped the other vehicle. The report found that 90 percent of these fatalities occurred in accidents in which a passenger car had entered the oncoming lane and that 10 percent of these fatalities had occurred in accidents in which a large truck had entered the oncoming lane.[27]

Drivers of large trucks involved in fatal accidents are also much less likely than drivers of passenger cars or light trucks involved in fatal accidents to be intoxicated. The percentage of large truck drivers involved in a fatal crash, who were intoxicated – with blood alcohol concentrations of .08 grams per deciliter or greater – was 2 percent in

2002, compared with 22 percent of passenger car drivers involved in fatal crashes in 2002 and 23 percent of light truck drivers involved in fatal crashes in 2002.[28]

More than half – 52 percent – of the people who died in accidents involving large trucks (excluding large truck occupants) from 1998 to 2002, were killed in traffic accidents in 11 states.[29] The five states that averaged the most number of people (excluding large truck occupants) killed annually in traffic accidents involving a large truck were Texas, which had an average of 409 deaths per year, California, which had an average of 315 deaths per year, Florida, which averaged 314 deaths per year, Georgia, which averaged 194 deaths per year and North Carolina, which averaged 174 deaths per year.[30] Data on traffic fatalities in accidents involving large trucks from 1998 to 2002 for each state can be found in appendix B.

Chart 8. States with largest annual and total traffic fatalities (excluding large truck occupants) from 1998 to 2002 in crashes involving large trucks

	AVERAGE ANNUAL NON-LARGE TRUCK OCCUPANTS KILLED ANNUALLY FROM 1998 TO 2002	TOTAL NON-LARGE TRUCK OCCUPANTS KILLED FROM 1998 TO 2002
Texas	**409**	**2,043**
California	**315**	**1,574**
Florida	**314**	**1,568**
Georgia	**194**	**968**
North Carolina	**174**	**868**
Ohio	**170**	**850**
Illinois	**165**	**826**
Pennsylvania	**164**	**818**
Missouri	**143**	**713**
Indiana	**140**	**698**

Source: TRIP analysis of NHTSA data

Approximately three-quarters (77 percent) of traffic fatalities involving large trucks from 1998 to 2002 occurred on roads with two lanes and 15 percent occurred on

roads with at least four lanes.[31] There were 19,680 traffic fatalities involving large trucks on two-lane roads from 1998 to 2002 and 3,935 traffic fatalities involving large trucks on roads with at least four lanes from 1998 to 2002.[32]

Chart 9. Traffic fatalities in crashes involving large trucks from 1998 to 2002 by number of lanes

One lane	**120**
Two lanes	**19,680**
Three lanes	**1,969**
Four lanes	**3,176**
Five or more lanes	**759**
Unknown	**361**
Total fatalities	**26,065**

Source: TRIP analysis of NHTSA data

TRIP's analysis of fatal accidents involving large trucks from 1998 to 2002 also determined that the majority of fatal truck accidents occur in rural areas and on roads posted with speed limits of at least 55 miles per hour. In fact, 73 percent of all fatalities involving large truck accidents happened on roads with a posted speed limit of at least 55 miles per hour.[33]

Chart 10. Fatalities in crashes involving large trucks from 1998 to 2002, by posted speed limit

	FATALITIES
30 mph or less	**1,104**
35 or 40 mph	**2,139**
45 or 50 mph	**3,822**
55 mph	**9,840**
60 mph or higher	**9,110**
No posted limit	**50**
Total	**26,065**

Source: TRIP analysis of NHTSA data

Approximately two-thirds (68 percent) of fatalities from crashes involving large trucks from 1998 to 2002 occurred in rural areas, with the remaining 32 percent of fatalities from truck accidents occurring in urban areas.[34]

Chart 11. Fatalities in crashes involving large trucks from 1998 to 2002, by rural or urban land use

	FATALITIES
Rural	**17,719**
Urban	**8,169**
Unknown	**177**
Total	**26,065**

Source: TRIP analysis of NHTSA data

Regional Efforts to Accommodate Increased Freight Movement

Many regional officials have become concerned that their current transportation system is inadequate to accommodate efficiently the growing demand for freight shipments in their region. Growing traffic congestion, which slows the delivery of freight, and concerns about traffic safety, have spurred many regions to begin planning significant improvements in their region's transportation system that will accommodate increased trucking and other freight shipments. These projects include plans to widen key highways, provide truck-only lanes along some highways, to relieve bottlenecks, particularly in urban areas, that slow truck access and to improve rail systems to accommodate some increased freight shipments.

Interstate 81 in Virginia

Virginia has studied the feasibility of truck-only lanes along the 325-mile length of I-81 in Virginia, which runs northeast to southwest along the Appalachians. The route is heavily traveled by large trucks and significant increases in truck and private vehicle travel are forecast for this corridor. The analysis of the project found that the truck lane proposal was feasible. Two groups of private firms have also submitted proposals to either widen or build truck-only lanes along I-81 in Virginia.[35]

Interstate 10 Freight Corridor Study

The eight states traversed by Interstate 10, which goes from Los Angeles to Jacksonville, Florida have conducted a study to look at potential improvements to accommodate the significant increase in trucking and passenger vehicle travel on this corridor. The study found that additional all purpose lanes would be the most effective means of relieving traffic congestion and maintaining freight movement reliability along this corridor. The report also found that truck only lanes may be appropriate for some segments of the route[36]. The cost of recommended capacity improvements along the corridor is approximately $21 billion. The eight states along the corridor are evaluating the report's findings to determine which recommended improvements could be implemented.

I-5 from Portland, Oregon to Vancouver, Washington

Washington and Oregon have worked together to agree on a set of transportation improvements to relieve traffic congestion and improve freight deliveries in the I-5 corridor from I-84 in downtown Portland to I-205 north of Vancouver. Without

improvements in the transportation system in this corridor, traffic congestion is expected to nearly double by the year 2020. This realization has led the two states to agree to a comprehensive set of improvements for this corridor. The improvements include the widening of a portion of I-5, increased capacity on the bridge over the Columbia River, improvements in regional transit and improvements in rail infrastructure in the region. Design, permitting and environmental review are proceeding with construction of some improvements slated to start in approximately two years.[37]

Seattle, FAST Corridor program

With one out of three jobs in the state of Washington reliant on foreign trade, the increase in traffic delays in the Puget Sound region threatens to reduce the efficiency of the state's economy. The area has responded by forming a partnership of local, state and federal government agencies, as well as the local business community, to initiate a program to systematically eliminate bottlenecks that slow freight movement in the region. The program has already completed $500 million worth of projects to improve freight movement in the region. These projects have largely focused on separating rail and road traffic by constructing overpasses. Additional projects are planned as part of the Freight Action Strategy for the Everett-Seattle-Tacoma Corridor.[38]

Mid-Atlantic Rail Study

Five states, Virginia, Maryland, Delaware, Pennsylvania and New Jersey are studying the feasibility of improving rail facilities in their states to increase rail carrying capacity in the region, primarily along the congested I-95 corridor. The improvements recommended by the study include updating antiquated bridges and tunnels, increasing

mainline capacity and removing major choke points that limit train speeds and the number of trains that can be carried in a corridor. The estimated cost of needed rail improvements in the region to accommodate increased rail freight movement is estimated at $6 billion. While most freight shipments in the region will continue to travel by truck, regional transportation officials believe that improvements to the region's rail system would allow increased rail shipments in the region will help accommodate the expected increase in freight deliveries[39].

Towards a National Freight Policy

With freight shipments by trucks expected to increase by 49 percent by 2020, it is critical that this increase in truck travel be accommodated without either a decrease in traffic safety or a significant increase in traffic congestion. Some transportation officials believe that the U.S. should develop a national freight policy to guide the development and improvement of the nation's freight movement system. Many of the proposals to improve traffic safety and relieve traffic congestion for large trucks will also have complimentary benefits for passenger vehicles. Possible solutions to safely meeting the nation's demand for increased freight deliveries include:

- **Additional highway capacity.** Most additional highway capacity that will be built is likely to be in the form of widening of existing roadways, improved alignments and improved intersections and interchanges.

- **Car-truck separation.** The construction of truck-only lanes, largely along existing highways, offers significant safety and congestion benefits. Truck only lanes are most feasible in areas with significant traffic congestion or an increasing truck/car mix. The economic benefits of truck-only lanes may provide these projects with an opportunity to use innovative public-private financing mechanisms to gain financing.

- **Additional rail capacity.** While the flexibility of truck travel will continue to favor truck over rail for most goods shipments, improvements in the nation's rail infrastructure, particularly in some highly congested corridors, may be helpful in accommodating some of the increased demand for freight movement.

- **Roadway operations.** Improvements to make highways operate more efficiently, such as electronic tolling, improved accident/incident management, ramp metering and improved driver information can help relieve traffic congestion.

- **Road safety improvements.** Safety improvements, particularly on two-lane rural roads, would be very helpful in reducing large truck/passenger vehicle accidents. Improvements such as the construction of passing lanes, lane widenings, reduced curves, better intersection design and improved markings and lighting should be effective in reducing the number of serious large truck/private vehicle accidents.

Transportation Funding

The long-term reauthorization of federal surface transportation legislation offers an opportunity for a significant increase in funding for improvements that would help safely accommodate the anticipated 49 percent increase in trucking by the year 2020.

The current 5-month extension of the Transportation Equity Act for the 21st Century (TEA-21) is set to expire on February 29, 2004, and the House, Senate and Bush administration have each proposed varying funding levels for the reauthorized legislation. A significant increase in federal highway funding would allow states to undertake numerous significant highway projects that would improve the reliability and safety of trucking. The Administration bill, or the Safe, Accountable, Flexible and Efficient Transportation Equity Act (SAFETEA), has been introduced in the House and Senate, and calls for $247 billion in spending over six years. The Senate bill, S.1072, mandates spending $311 billion over six years, while the House bill, H.R. 3550, or the Transportation Equity Act: A Legacy for Users (TEA-LU), sets spending at $375 billion over the life of the legislation. Both the Senate and House bills have been introduced, but not enacted.

The House proposal for a long-term federal surface transportation program, which would run from 2004 to 2009, includes funding earmarked for adding truck lanes to key highways, improving road connections to key air, rail and maritime ports and for rural road safety improvements. The House bill includes $1.5 billion for building truck lanes, $3 billion for improving road connections to and from freight facilities and $1.5 billion

for rural road safety improvements. The House bill also includes a program to assist state and local governments in the planning and development of transportation projects , that will improve the efficiency of freight movement.

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