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**An Analysis of State DOT Options for Transporting  
Future Freight Flows on the U.S. Interstate Highway System**

**(Freight on the Interstate Highway System: Current State, Forecasts, and Alternatives)**

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**A Research Project Report  
For the Mid-Atlantic Universities Transportation Center (MAUTC)  
A U.S. DOT University Transportation Center**

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## **Abstract**

Over the course of its history, there has been a dramatic increase in automobile and truck traffic, from 54 million vehicles in the U.S. in 1956 to 237 million in 2006. Interstate planners did not foresee the rapid growth of freight transportation on the interstate highways. Representing just over 3% of the nation's highway system mileage, the interstate highway system carries about 24% of all roadway traffic. Truck transportation on the interstates comprises almost 20% of this total traffic and further growth is expected in the coming years.

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1. Pursue private sector investment opportunities.
2. Form regional planning commissions of public and private partners.
3. Implement tolling practices in congested areas.
4. Increase capacity of Interstates near port and rail facilities through infrastructure improvements.

In addition to the above recommendations, an Interstate study group should be formed in order to conduct a major policy study on the future of the Interstate system. The study should be led by the National Research Council and completed prior to the next transportation bill in 2009. A comprehensive study would greatly benefit decision-makers and transportation officials as our nation heads into the future.

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## Chapter 1: Introduction

“The Interstate System will never be finished because America will never be finished.”  
- Francis C. “Frank” Turner,  
Federal Highway Administrator (1969-1972)  
August 19, 1996

### ***1.1 Interstate Highway System 50-year Anniversary***

The Interstate Highway System now marking its 50th anniversary is the largest, most expensive, and arguably the greatest public works project in United States history. Consisting of over 46,837 miles, the system connects every corner of the country and has assisted in leading our nation into a period of unprecedented economic prosperity and wealth. Officially called the Dwight D. Eisenhower National System of Interstate and Defense Highways, the system is more commonly known as the Eisenhower Interstate Highway System. For the purposes of this study, it will be referenced as the Interstate system, or as the Interstate.

The Interstate system moves people and goods by offering safe, fast, and inexpensive travel from city to city, suburb to suburb, or countryside to countryside. The system provides an efficient way to move goods from ports, rail lines, and manufacturing centers to cities across the nation. Connecting the contiguous 48 states and all but five state capitals, the Interstate system provides the United States with a level of access that is found nowhere else in the world. Enormous engineering challenges were associated with the plan for a limited-access highway system. Now nearing total completion, new challenges face transportation planners, politicians, and the public as the country moves into the next half-century. Former Transportation Secretary Norman Mineta recently said, “Even as we celebrate the achievement of the Interstate on the occasion of its

Golden Anniversary, we must also think about the next 50 years – how we are going to build and maintain the roads to keep the American economy moving.”<sup>1</sup>

## **1.2 Problem Statement**

The Interstate system will be unable to maintain a consistent, cost-effective flow of freight in the next half-century because of the dramatic increases in vehicles and trucks using the system. Traffic growth will continue along with economic and population growth in the coming decades. The Interstate system is reaching capacity in many places across the U.S. Currently, the future of the Interstates and its role in transporting passengers and freight is unknown. Finding solutions to the congestion seen on the Interstate today and determining the places that transportation planners and government should be spending money are vital to the future of the Interstate.

Much discussion is taking place on potential solutions or methods that could improve current freight flows. The growth in demand for freight transportation has already outgrown the infrastructure improvements. The efficiency of the Interstate system is threatened because of increasing congestion on the highways. Failure to address the situation could result in severe economic, environmental, and logistical costs. America has a world-class highway system in place, but the question now is what to do with it? What are the options available to state departments of transportation (DOTs) so that they can properly plan for or address freight flows on the Interstates?

### ***1.3 Purpose and Scope***

The purpose of this research is to investigate the current state of freight on the Interstate system, determine the attitude of state DOTs towards interstate freight, and suggest options for freight transport and the future of the Interstate system. This will be accomplished by following a methodology that leads to finding viable transportation options that states will be able to pursue. The methodology consists of identifying the current issues surrounding the Interstate and freight transportation and surveying state DOTs to identify initiatives they are undertaking to remedy those issues. The rationale behind such a methodology is to capture the current attitudes of transportation planners and find options for the future that would allow for freight transportation to continue at or improve upon its current flow.

Additional surveys, studies, and articles were used to supplement a questionnaire that was sent out to state DOTs. Identifying methods currently being used or that are planned by state DOTs across America will highlight options available to highway transportation planners and engineers. Data collection in the study included the gather and review of existing statewide and regional freight plans and studies, existing datasets, and other recent freight planning documented efforts. The scope of the research was limited to the United States and its Interstates.

States currently do not have a compilation of methods or alternatives to learn from. Some states already have well-developed freight planning departments, but others have placed little or no thought into freight planning and the future of the Interstates. This research project provides recommendations that allow states to enhance or develop their freight planning cells.

## **1.4 Study Objectives**

The specific objectives of this study are as follows:

1. Examine literature and learn from past studies on the Interstate to determine potential options for handling future freight flows.
2. Assess the impacts that future changes in the freight system and freight movement may have on the nation's Interstates.
3. Determine and compare the current methods and techniques that state transportation planners and engineers are using to improve freight transportation on the Interstate system.
4. Identify feasible options that state DOTs could pursue in order to facilitate freight flows on the Interstates.
5. Identify future research needs or studies.

## Chapter 2: Interstate History and Current Condition

“Transportation is key to the productivity, and therefore the success, of virtually every business in America. Congestion and delay not only waste our time as individuals, they also burden our businesses and our entire economy with inefficiency and higher costs.”

- Former Secretary of Transportation Norman Mineta  
January 2001

### ***2.1: Background***

#### **2.1.1 History of Freight Transportation in the United States**

From the beginning of time, man has been moving goods. The earliest societies learned to float goods down rivers and to use animals for carrying materials. Over 2000 years ago the Romans constructed roadways to connect the cities of their empire in order to move materials and soldiers. Only recently, over the past 200 years, have different modes of transportation evolved. The United States has matured from water transport on boats, to rail transportation on trains, to automobile transport on vehicles, to air transport on planes. And while boats, trains, and aircraft are all used in today’s freight world, trucks are the dominant mode of freight transport in the U.S. The Freight Analysis Framework (FAF) estimates that trucks carried about 71% of all tonnage and 80% of the value of all U.S. shipments, in all modes, in 1998.<sup>2</sup>

After World War II, the United States transitioned from a mass-production and consumption society to a post-industrial, or information society with an expanding service sector.<sup>3</sup> Economic deregulation and globalization of production and trade demanded changes in distribution and logistics requirements. In general, the shift from a manufacturing to service oriented society caused a demand in small shipments, which increased freight traffic. Customers in today’s world require flexible, reliable, and timely

service, thus necessitating trucks in order to meet consumer demand.<sup>4</sup> High-volume freight transportation on all modes will continue to grow in today's world, but trucking services will grow even faster.

The economic deregulation that has occurred in the United States over the last quarter of the 20<sup>th</sup> century has been viewed as widely successful. It has restructured the transportation world and caused mergers, consolidations, price reductions, and streamlined shipping practices. Deregulation has benefited the railroad industry, ocean carrier industry, and air transportation industry, but none of these modes has seen the explosion in carriers experienced by the trucking industry. The number of interstate motor carriers increased from 216,000 in 1990 to over 500,600 in 2000!<sup>5</sup> Given this trend, the volume of truck traffic on the Interstate system will continue to grow into the 21<sup>st</sup> century. Truck vehicle miles traveled (VMT) is expected to grow by more than 3% annually through 2020.<sup>6</sup> This growth will almost double the truck VMT by 2020, ensuring the Interstates will be congested even more in the future.

Freight transportation in the U.S. is both a public and private enterprise. The government builds and operates the infrastructure of the highways and regulates transportation firms. Private-sector firms play a large role in rail, air, and waterway modes, but also predominantly provide the vehicles that operate on roads and sell transportation services to shippers. This mix of public and private enterprise creates an interesting dynamic and builds expectations for responsibilities that are difficult to meet.



## 2.1.2 Interstate Highway System

The Interstate system officially began when President Dwight D. Eisenhower signed the Federal-Aid Highway Act of 1956. This guaranteed federal funding for a national highway system that had been under investigation for many years. The bill permitted state highway engineers to develop a 42,500-mile system of limited-access highways that connected most of the larger cities in the country. But while the federal government assumed most of the responsibility for funding the Interstate highway system, the state DOTs were the builders and owners of the highways. Today, this relationship between the state DOTs and federal government still exists. The DOTs are responsible for planning, constructing, expanding, and maintaining their Interstates, while the federal government still provides the majority of the funding.

The concept of a limited access highway began many years before 1956. Congress first provided funds for a national highway network in 1916. During the 1930's and 40's, the Bureau of Public Roads, now the Federal Highway Administration, urged states to conduct traffic counts and origin-destination surveys in order to develop a national system of roads. After World War II, Congress understood that a system of highways was needed in America. But lack of agreement on how to fund the roads produced no agreement on how to proceed. Many states began constructing highways on their own, mainly financing the construction through tolls. In 1954, President Eisenhower finally addressed the situation and leveraged Congress by alluding to the civil defense implications of an Interstate system – adding to the political momentum that had already begun. After even more political debate, a joint House-Senate conference reached an agreement in June, 1956 and President Eisenhower signed the bill authorizing

over 40,000 miles of highway with the federal government funding about 90% of the cost.

The Interstate system is truly an engineering marvel. Using the methods developed from previous railroad and highway construction, learning from construction techniques perfected from engineers during World War II, and seeing the limited access highway concept in use on the German Autobahns, highway engineers began constructing the system that Americans take for granted today. Design standards and specifications made it safe to travel at high speeds, offering a safe and fast way of traveling.

Planners designed the Interstate with a 20-year life span. While most all of the original surfaces and bridges have been replaced, the capacities of Interstates have not kept up with the demand. Between 1980 and 2000, the highway VMT increased 80% while lane-miles increased by only 4%.<sup>7</sup> The total vehicle miles traveled today far exceeds the expectation for which early transportation engineers planned. While today's Interstate system provides high-level mobility with reduced travel times and provides a higher level of safety than non-interstate roads, segments are increasingly becoming congested, slow moving, and cost-ineffective routes. Table 2.1.2 shows the populations, vehicles, and vehicle miles traveled for the Interstate system from 1956, 1965, and as it stands today.

**Table 2.1.2: Growth of the Interstate Highway System<sup>8</sup>**

	<b>1956 Actual</b>	<b>1965 Actual</b>	<b>2006 Actual</b>
<b>Population</b>	169 million	194.3 million	300 million
<b>Vehicles</b>	54 million	90.3 million	237 million
<b>VMT</b>	628 billion	888 billion	3 trillion

The Interstate system is the most critical component of the nation’s transportation system. While it accounts for only 3% of all lane miles of roads in the U.S., they carry 24% of all travel in the nation. This amazing statistic shows the importance of the Interstate system and the dependence that Americans place on it.<sup>9</sup>

### **2.1.3 Federal Role in Transportation**

The United States is well into the “post-Interstate” era. The federal government no longer funds construction of multi-lane expressways through cornfields or cities, but rather encourages high-speed rail, preservation of highways, and other transit modes.<sup>10</sup> Since 1991, our country’s transportation community has survived via three bills passed in Congress: the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21, 1998), and the current Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). These bills have appropriated billions of dollars for construction and maintenance of highways and other transportation facilities.

The Federal-Aid Highway Act of 1981 expanded a 1976 program to include reconstruction of the Interstate system in addition to resurfacing, restoration, and rehabilitation (3R). This program lasted until the adoption of ISTEA, which established a

new Interstate maintenance program. ISTEA allowed for the 3R work and for the reconstruction of bridges, interchanges, and over-crossings along existing Interstate routes, but could not be used for the construction of new travel lanes other than high occupancy vehicle lanes or auxiliary lanes.<sup>11</sup> The 1998 TEA-21 expanded ISTEA to include eligibility to receive funds for reconstruction, however, the funding of added lanes was still not allowed. Authorizing an investment of \$286 billion over the six-year period 2004-09, SAFETEA-LU maintains state spending flexibility between highway and transit, encourages innovative finance mechanisms, and emphasizes comprehensive safety planning. But although a record amount of money has been spent and much progress made over the past 15 years, much remains to be done in order to meet the highway and transit challenges of the future. SAFETEA-LU's annual funding gains are only 1.8% when accounting for inflation and do not come close to meeting the nation's transportation needs as outlined repeatedly in federal government and private sector reports.

SAFETEA-LU guarantees \$227.6 billion or 79.4 percent of spending on highways from 2004-2009. This money will be distributed for projects throughout the states. Of question, however, is if states choose to utilize this money for relief of congestion on freight routes. The bill does address a few freight specific areas. It provides \$25 million for development of truck parking facilities on the national highway system. It also funds a new Freight Planning Capacity Building Program with \$3.5 million. SAFETEA-LU will continue to support through 2009, but a new transportation bill needs to place more emphasis on the concerns of freight congestion.

## **2.1.4 National Surface Transportation Policy and Review Study**

### **Commission**

The newly-formed Congressionally-authorized National Surface Transportation Policy and Revenue Study Commission is responsible for developing recommendations to Congress on the future directions and financing of the surface transportation program. Created under Section 1909 of SAFETEA-LU, the commission was formed because members of Congress declared, “that it is in the national interest to preserve and enhance the surface transportation system to meet the needs of the United States for the 21<sup>st</sup> century.” The commission, comprised of members representing Federal, state, and local governments, metropolitan planning organizations (MPOs), transportation-related industries, and public interest organizations, is working to identify and examine the current condition and future needs of the nation’s surface transportation system.

Some of the Commission’s initial tasks are to establish a vision that identifies the needs and determines how to fund them. Current Trust-Fund based support works in the opposite way, with projects and plans revolving around the amount of money being distributed. Tolling, market-based approaches, and private sector involvement are all topics of research and debate for the Commission. They are also looking at short and long-term alternatives to replace or supplement the fuel tax as the principal revenue source to support the Highway Trust Fund over the next 30 years. The Commission is releasing their findings in a July 2007 report.

In May 2006, former U.S. DOT Secretary Norman Mineta announced the National Strategy to Reduce Congestion on America’s Transportation Network<sup>12</sup>. This strategy provides the framework for government officials, the private sector, and

transportation planners to attack today's congestion problem head-on. The initiative consists of a six-point plan for addressing congestion relief:

- **Relieve urban congestion:** The Department will seek to enter *Urban Partnership Agreements* with cities in which both parties will: commit to implementing a broad congestion pricing or variable toll demonstration; create or expand express bus service which will benefit free flow traffic conditions; secure agreements from area employers to establish or expand telecommuting and flex scheduling programs; and expedite completion of the most pressing highway capacity projects that hold the greatest potential for reducing congestion and improving freight flow.
- **Unleash private sector investment resources:** The Department will work to reduce or remove barriers to private sector investment in transportation infrastructure by: encouraging states to enact legislation enabling them to enter into infrastructure agreements with private sector companies; educating, demonstrating, and building relationships with state agencies and private investors; and using Federal program authorities under SAFETEA-LU to encourage formation of public-private partnerships.
- **Promote operational and technological improvements:** The Department will advance low-cost improvements that increase information dissemination and incident response capabilities by: encouraging states to improve operational performance, including better real-time traffic information to all system users; emphasizing congestion reducing

technologies such as ITS; and identifying private sector partnering and financing opportunities to improve incident and intersection management.

- **Establish a “Corridors of the Future” competition:** The Department will accelerate the development of multi-state, multi-use transportation by: running a competition to select 3-5 major growth corridors in need of long-term investment; convening a multi-state process to advance project development and seek alternative financial opportunities; and fast-tracking major congestion reducing corridor projects that received funding in SAFETEA-LU.
- **Target major freight bottlenecks and expand freight policy outreach:** The Department will address congestion in the freight system by: transforming DOT’s existing Gateway Team into an Intermodal Hot Spot Team to convene regional stakeholders and gain consensus on immediate and long-term transportation solutions; engaging shippers from retail, manufacturing, agricultural, and technology sectors as well as freight carriers through a series of summits structured around the Department’s National Freight Policy Framework; and establishing a senior-level border congestion teams to prioritize infrastructure improvements on congested border crossings.
- **Accelerate major aviation capacity projects and provide a future funding framework:** The Department will address congestion in the aviation system by: designing and deploying a modernized aviation system with greater capacity and less congestion; Improving efficiency

and reducing delays, including a redesign of airspace and the use of market-based tools to manage congestion at crowded airports; and giving priority treatment and agency resources to projects that improve aviation system capacity.

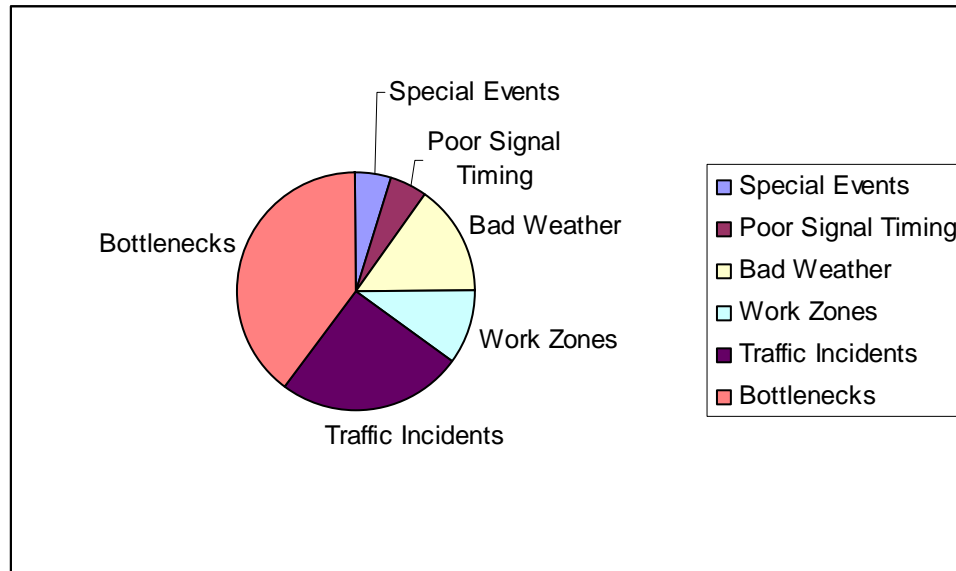
U.S. DOT believes their initiative will motivate DOTs, educators, and planners across the country to become more involved in finding solutions to congestion and freight transportation issues. While not every step of the initiative specifically involves freight trucking or the Interstate Highways, the overall vision of managing freight transportation will benefit freight moving on the highways.

## ***2.2 Issues, Concerns, and Challenges***

### **2.2.1 Congestion**

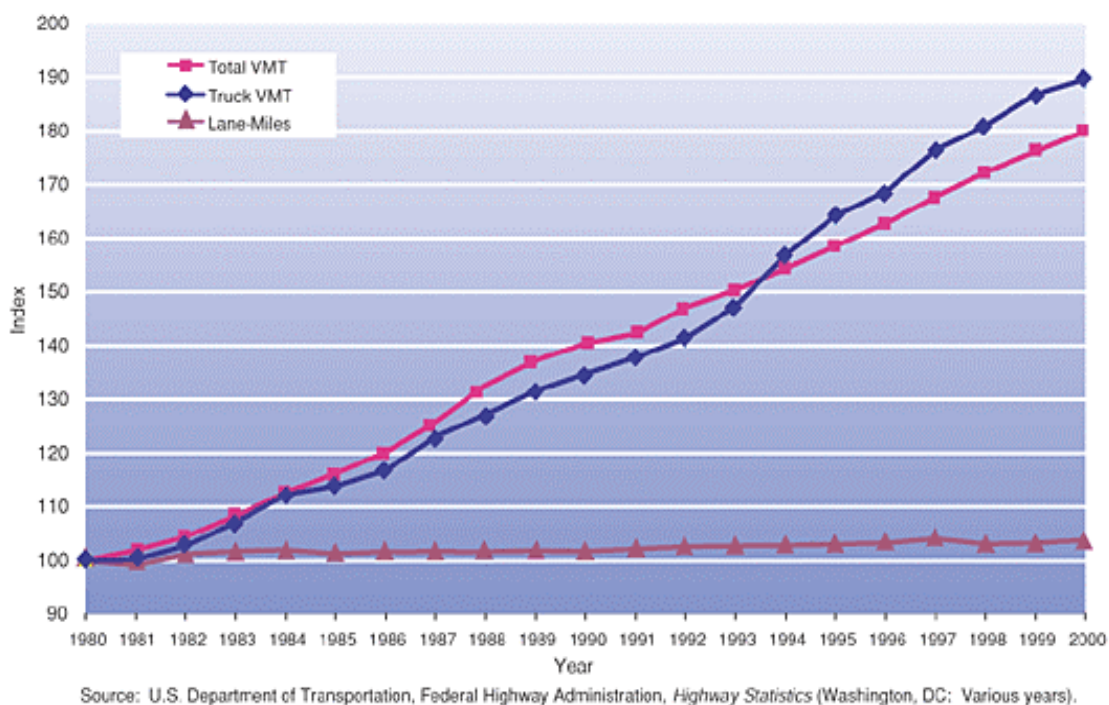
Former Secretary of Transportation Norman Mineta recently said, “Finding a way to tackle congestion more meaningfully and successfully is not a problem for some future generation. It is an urgent challenge for today’s leaders.”<sup>13</sup> With increasing congestion on the Interstate highways, the system has become strained in many locations and has led to conflict between the trucking industry and the traveling public. Solutions to reduce congestion will not be easy. Cures will likely involve a mix of investments to add new capacity, preserve existing infrastructure, and improve operations.



**Figure 2.2.11: Causes of Congestion**

Congestion stems from too many people trying to move at the same time on the same system. Figure 2.2.11 shows the causes of congestion. Bottlenecks, many of which are caused by heavy truck traffic, are the leading cause of congestion. Without a doubt, the United States has the best highway system in the world. But Americans also live in low-density communities that necessitate automobile use. Eighty-eight percent of America's daily commuters use private vehicles each day on their way to work, school, and other locations. The current road capacity is not meeting the demand, especially during the peak-hours of vehicle travel. Peak-period congestion affected 28% of urban portions of the National Highway System in 1998 and is expected to affect 46% in 2020.<sup>14</sup>

**Figure 2.2.12: Vehicle-Miles Traveled (VMT) and Lane-Miles: 1980 - 2000**



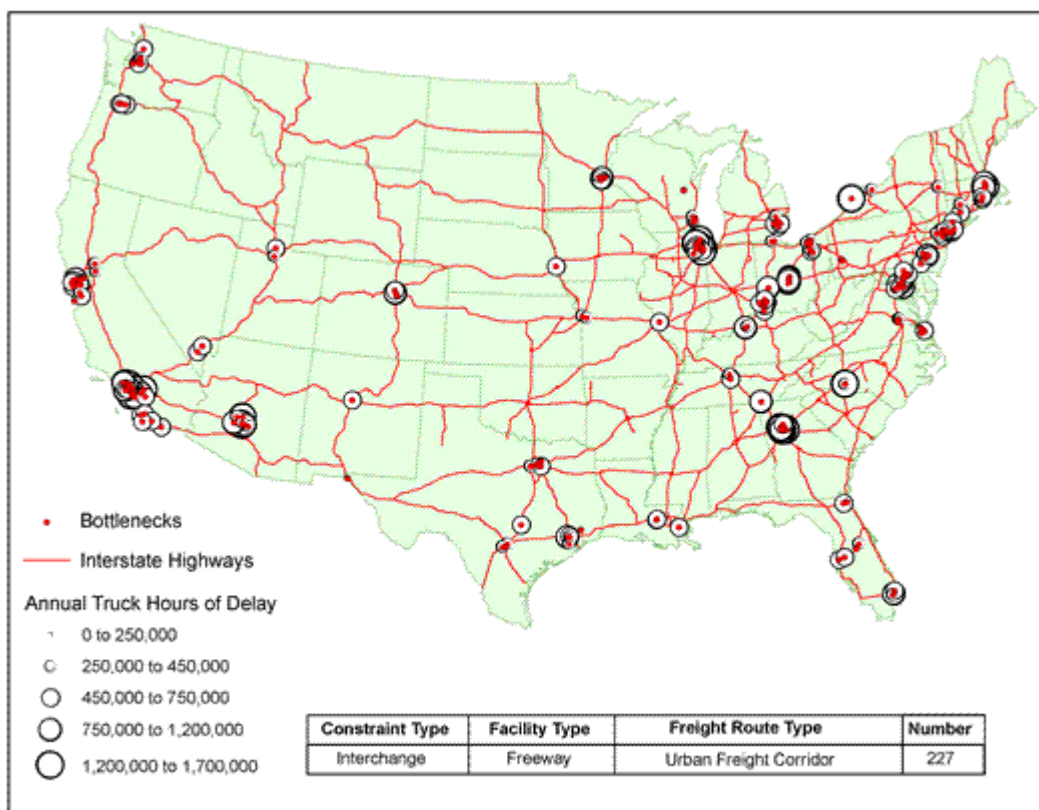
In addition to the normal automobile travel, the U.S. Department of Transportation says that freight traffic is expected to increase by two-thirds from 2006 to 2020. In terms of vehicle-miles-traveled, the total VMT is rising at 2.5% annually. Truck VMT is growing at a 3% pace. Trucks take up just as much room as two or three regular sized automobiles, further adding to the already busy highways. With little chance of increasing urban road capacity sufficiently, the increase in truck volume continues to add to congestion woes. Figure 2.2.12 shows the dramatic increase in both truck and total VMT as compared to the increase in lane-miles.

Population growth is the most obvious reason for traffic congestion. From 1980 to 2000, the total population of the United States rose 24%, but the total vehicle miles traveled grew 80% because of more intensive use of each vehicle.<sup>15</sup> Additionally, the

human population is expected to grow another 60 million by 2020 which means that potentially millions of more vehicles will be added to the national stock.

The problem is congestion on the Interstates, not lack of capacity. Capacity will always be inadequate as long as Interstate use is free. Congestion will develop in areas that are populated. Freight transporters are facing capacity overload near coastal port cities where land is expensive and difficult to obtain in order to add capacity to Interstates. Passenger car traffic coupled with freight trucks accessing port facilities equates to severe congestion for all.

**Figure 2.2.13: Interchange Capacity Bottlenecks on Freeways Used as Urban Truck Corridors**



Source: Cambridge Systematics and Battelle Memorial Institute, *Freight Bottlenecks*, unpublished white paper for FHWA Office of Policy, March 2005

### **2.2.2 Economic Impact of Congestion**

Conceived as a means to connect cities and to relieve traffic congestion, the Interstate system today is faced with congestion issues that are of great concern. Serving as the most critical link in our nation's transportation network, the Interstates save the nation \$737 billion annually in safety benefits, saved time, reduced fuel, and lower consumer costs.<sup>16</sup> But congestion on the Interstates means longer travel times and decreased reliability for pick-up and delivery times for truck operators. According to a FHWA 2002 study, the trucking industry has shown that shippers and carriers value transit time in the range of \$25 to \$200 per hour depending on the product being carried.<sup>17</sup> Studies also show that between 1998 and 2020, the value of highway freight will increase 204% and the number of tons shipped on highways will grow 75%.<sup>18</sup> A large percentage of the prices consumers see is dependent upon the costs associated with transporting the goods. Congestion adversely affects the reliability and timeliness of delivery.

**Figure 2.2.2: National Highway System Estimated Peak Period Congestion: 2020**



### 2.2.3 Just-in-Time Supply Trend

Just-in-time (JIT) is an inventory strategy that has had a dramatic effect on the quantity of trucks moving freight on Interstate highways. The premise of JIT is to have the right amount of inventory available to meet the demands of the end customers. This “pull” logistics system is characterized by time-definite delivery and customer driven strategies. It depends on timely and accurate information about customer demand to track market movements and fast and reliable transportation to meet customer demand. When implemented correctly, JIT can lead to significant improvements in a manufacturing organization’s return on investment, quality, and efficiency. But because of the small inventories, bulk carriers and shipments are becoming a thing of the past. Now companies focus on how to ship smaller quantities of material since full truckloads

are seldom used in JIT. Naturally, the trucking industry has stepped forward to meet this demand for flexible, small shipments. More and more businesses are moving to some form of JIT and this will continue to increase the number of trucks on our nation's highways. While this style of logistical movement causes an increase in the complexity and size of the logistics system, it also adds to the fragility of logistics and transportation systems.

### **2.2.4 Importance of Reliability**

Delivering freight on time, at the right location, and to the right customer is the underlying goal of every shipping company. Late arrivals can cause significant economic costs to customers. In an economy driven by a service oriented market, reliability is vital to a business's success. The Interstate system has provided a safe, efficient, and reliable network for freight delivery in the past. But increasing congestion on the Interstates makes it increasingly difficult for shipping companies to maintain a reliable network. Supplying cities with goods and services and disposing of waste has become a central problem of transport planning because of the congestion in urban areas. Cities and local authorities must confront these problems to a much greater extent than ever before.<sup>19</sup> The reliability of the trucking industry will continue to decline in the future if solutions do not help alleviate the issue.

Congestion greatly affects the reliability and delivery costs of the trucking industry. While congestion has risen at an alarming rate on Interstates across the nation, an even greater concern is the unpredictability of travel times. With the move to "just-in-time" delivery methods, trucks are expected to deliver items just before they are needed.

The rapid growth of online commerce over the past decade has placed an enormous new strain on the trucking industry and an unexpected burden on the nation's Interstate Highway System.<sup>20</sup>

The attitude of the freight trucking industry is changing as the Interstates become more congested. John Horsley, the executive director of the American Association of State Highway and Transportation Officials (AASHTO) says that AASHTO met with leaders of the e-commerce industry several years ago looking to partner with them in order to promote improvements to the nation's highways. The industry declined the offer at the time, but has recently returned to team with AASHTO in order to find more efficient ways to move goods along the Interstates.<sup>21</sup> Today, many private industries are working with highway officials in order to find solutions to maintaining efficient movement on the Interstate system.

The report by the Texas Transportation Industry, *Traffic Congestion and Reliability*, said that improving the reliability of highway travel times would save time, conserve fuel, reduce emissions, reduce the incidence and amount of late delivery charges incurred by carriers, and improve commerce across the nation's borders.<sup>22</sup> Great efforts are being taken by most states and virtually all shipping companies to increase the reliability on the nation's highways.

An example of the decrease in reliability can be seen in Atlanta, Georgia. Atlanta has a history of significant congestion. Table 2.2.4 shows that most travel times grew more unreliable on freeway corridors over a four-year period. The unreliability is indicated by increases in the buffer index - as it rises, travel times become more

unreliable.<sup>23</sup> The buffer index represents the extra time that travelers must add to their average travel time when planning trips in order to ensure on-time arrival.

**Table 2.2.4: Reliability Statistics, Atlanta, Georgia 2000-2003**

Atlanta Freeway Corridor	Buffer Index			
	2000	2001	2002	2003
I-75A, NB (I-285 to I-20, 7.72 miles)	21%	29%	33%	35%
I-75A, SB (I-20 to I-285, 7.36 miles)	12%	22%	25%	33%
I-75B, NB (I-20 to I-85 Split, 3.73 miles)	48%	59%	58%	100%
I-75B, SB (I-85 Split to I-20, 4.04 miles)	24%	36%	32%	56%
I-75C, NB (I-85 Split to I-285, 8.95 miles)	30%	39%	32%	35%
I-75C, SB (I-285 to I-85 Split, 9.63 miles)	13%	29%	42%	50%
I-85A, NB (Camp Creek Parkway to I-75, 4.18 miles)	6%	1%	1%	3%
I-85A, SB (I-75 to Camp Creek Parkway, 4.05 miles)	7%	8%	5%	8%
I-85B, NB (I-75 to Jimmy Carter Boulevard, 14 miles)	22%	49%	19%	23%
I-85B, SB (Jimmy Carter Boulevard to I-75, 13.6 miles)	41%	37%	31%	34%

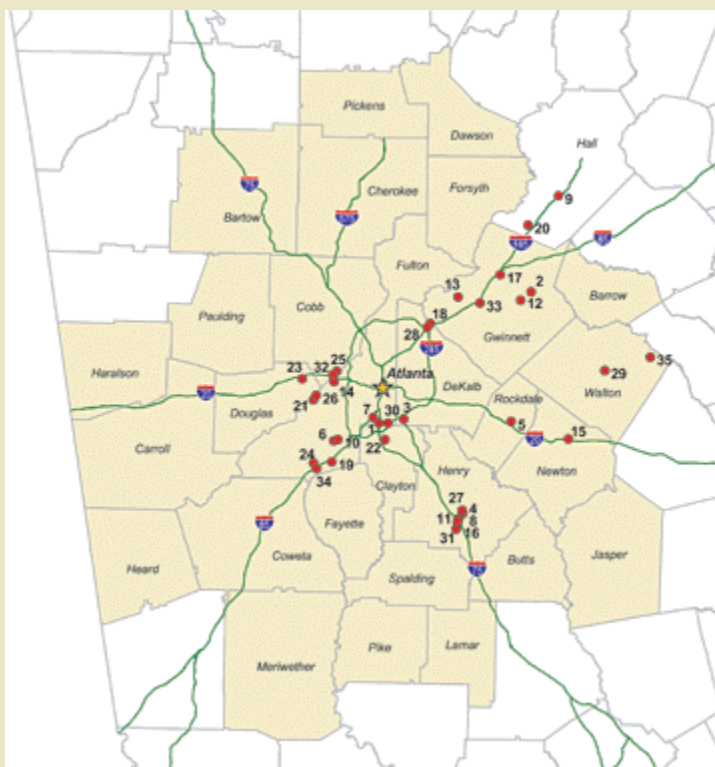
Atlanta is an attractive location for companies to locate their distribution centers. Georgia's national prominence as a transportation hub stems from Atlanta's freight-serving Hartsfield International Airport, Savannah's port facilities, and the state being serviced by 15 Interstate Highways. Spurred by the e-commerce industry, warehouses and distribution centers have been constructed along Interstate corridors surrounding Atlanta. The freight transportation assets have attracted multiple companies because of the lower costs associated with moving goods throughout the southeast United States.



While this brings jobs and wealth to the region, it also contributes to truck traffic and congestion on the Interstates.

**Figure 2.2.4: Atlanta Warehouse & Distribution Centers<sup>24</sup>**

Atlanta has the seventh largest industrial market in the U.S. and is home to many large regional and national distribution centers, representing many of the world's best brands.



A Sample of Metro Atlanta's Largest Warehouse & Distribution Centers

1	Ford Motor Co
2	Publix/Distribution & Manufacturing
3	Archwood Protection
4	Toys R Us/Babies R Us/Distribution Center
5	SOLO Cup Co
6	Kellogg's
7	Owens-Illinois Glass of NA
8	Nestle Logistics
9	Continental Tire North America Inc
10	GE Appliance Warehouse
11	DSC Logistics
12	Georgia-Pacific Corp
13	Southland Bonded Warehouse Inc
14	SUPERVALU Southeast Region
15	SKC Inc
16	Ford Motor Co/Parts Distribution Center
17	United Stationers Supply Co
18	Nordic Cold Storage LLC
19	Scott's Lawncare
20	Wrigley Co
21	M&W Distribution Services Inc
22	Kmart Distribution Center
23	Maytag Corp
24	Owens Corning
25	MSC Industrial Supply Co Inc
26	AmeriCold Logistics LLC
27	Snapper Products Inc
28	Quebecor World
29	Walton Fabrics
30	Sears Logistics Services Inc
31	Tyco Healthcare Retail Group
32	Solution Property Group
33	Office Depot Distribution Center
34	S.C. Johnson
35	Walmart Distribution Center

Note: Sample of distribution centers 500,000 square feet or larger. Not a comprehensive list.

### **2.2.5 Commercial Industry and Parcel Service**

The Commercial Industry has changed dramatically over the past 50 years. Gone are the days of the mom-and-pop stores, full-service gas stations, and waiting for catalog orders to arrive at the store. The Interstate system helped change the way that businesses streamline their operations and sell their products because it offered a fast, reliable, and economical way of transporting goods. During the past two decades, parcel and express shipments have transformed the parcel industry and greatly impacted the freight transportation system. It plays an extremely important role in the U.S. economy as it enables the transportation of time-sensitive shipments that are critical to the competitiveness of businesses both domestically and internationally.

The three major U.S. parcel couriers, the United States Postal Service (USPS), Federal Express (FedEx), and United Parcel Service (UPS), have all seen dramatic increase in shipments in recent years. USPS shipments increased from 102-billion pieces of mail in 1980 to 206-billion in 2004. FedEx grew from 68,000 to 3.2-million parcels shipped during this same time.<sup>25</sup> The volume of materials carried via truck is enormous. On a normal day, UPS will have a package volume of roughly 15-million packages. During the “peak” holiday season, this can swell to over 21-million. UPS has a ground delivery fleet of over 91,700 package cars, vans, and tractor trailers. Considering that most packages must be both picked up and delivered via ground transportation, it is easy to see how parcel couriers are adding to congestion and struggling to maintain reliable and timely services.

These parcel businesses authored the “hub and spoke” streamlined model of parcel delivery with their major hubs located near large demographic centers of the U.S.

The package is first sent to an origin processing facility, then to an origin regional center, then to a destination regional center and destination processing facility, then finally to its recipient. Most of these trips are handled by package carrying trucks, with air transportation handling the longest journeys. UPS Freight operates a fleet of over 6,700 tractors and 22,100 trailers from a network of more than 200 terminals. The company advertises over 20,000 one-day and two-day lanes – adding even more trucks to the already crowded Interstates.<sup>26</sup>

### **2.2.6 Security Concerns**

The security of freight on the Interstate system has become a very important concern for transportation officials. The focus is to prevent attacks and enhance security while maintaining commercial flow. The freight sectors dependence on containerization and global supply chains poses many security risks. Since Interstates run throughout the central business districts in many of the most populated cities in America, tracking trucks as they move goods along the Interstates has become a top priority. Systems such as smart cards, electronic cargo seals, and wireless vehicle-to-roadside data communication devices are being developed. Controlling access to the Interstates is a difficult task. The challenge for transportation decision-makers is to balance security needs with freight production.<sup>27</sup> But while security in the trucking world presents many obstacles, it might also provide opportunities for increasing efficiency and productivity.

America's ability to respond to terrorist attacks or natural disasters is greatly enhanced by the Interstate system. The terrorist attacks of September 11, 2001 and Hurricane Katrina in 2005 proved an even greater reliance on the transportation systems.

The Interstate evacuated people in need, moved critical supplies and emergency workers, and allowed essential resources to move into affected areas. Former Secretary of Transportation Norman Mineta said, “It is no coincidence that terrorists target our transportation systems. They are the heart of modern societies and modern economies.”<sup>28</sup> The impact of future security measures remains to be seen. Stricter container inspections and port access controls could have a major affect on the flow of goods. This most likely will not affect the trucking industry. Goods will still have to move from ports once they pass inspections. Where security measures are more likely to affect trucking is at the international border crossings with Canada and Mexico because of increased delay times.

## ***2.3 Growth on the Interstate Highway System***

### **2.3.1 Automobiles**

Originally designed to facilitate automobile travel from city to city, the Interstate Highway System has evolved into a superhighway that has contributed to urban sprawl and changed the landscape of American cities. Officials wanted the Interstates to connect the suburbanites to central business districts. But in most cases, they spurred an exodus to the suburbs as people began to move out of the cities instead of people coming into cities.

Travel on the Interstate system is expected to increase by 60% by the year 2026. Population growth and the love of owning an automobile has led to a growth in car ownership. There are approximately 2.1 automobiles for each person in the United States. This is lower than Japan, but much higher than European countries. The country

surpassed the 300 million person mark this year and estimates predict the U.S. will pass the 400 million mark around 2040. The number of automobiles will continue to rise along with the population.

### 2.3.2 Freight and Trucking

Throughout the United States, freight traffic on the Interstates is increasing faster than on any other functional system. For example, between 1993 and 2002, combination truck travel grew by 4.4% annually on urban Interstates and by 3.7% on rural Interstates. By comparison, truck travel on all roads increased by only 3.3% during the same time period. Future growth of trucking on Interstates looks even greater. According to the U.S. Department of Transportation, freight traffic is expected to increase by two-thirds by 2020.<sup>29</sup>

Table 2.3.2 shows the significant growth of trucks over the twenty year period from 1980-2000.

**Table 2.3.2: Trucks being used in commercial transportation**

	1980	1990	2000
Truck Single-unit 2-axle 6-tire or more	4,373,784	4,486,981	5,926,030
Truck, Combination	1,416,869	1,708,895	2,096,619
Truck, Total	5,790,653	6,195,876	8,022,649

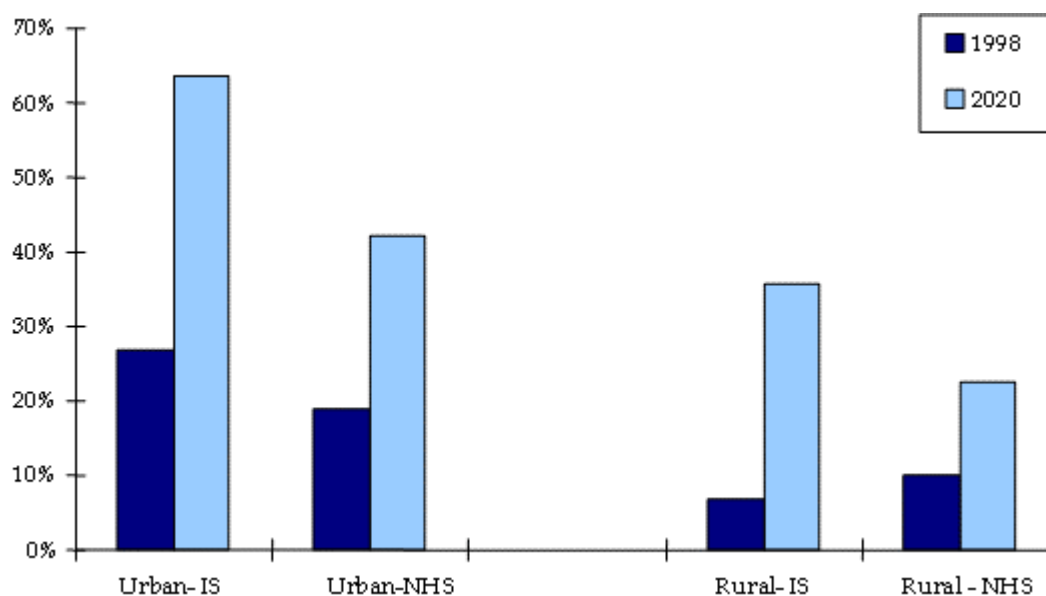
The strength of the U.S. economy is greatly influencing the growth in the truck transportation and warehousing industry. As the production of sales and goods increases, there is an increase in the demand for transportation services to move goods from their

producers to consumers. The growth of the actual trucking industry will continue to grow as the result of manufacturers outsourcing their distribution to trucking and warehousing companies. Additional trucks will appear as consumers and businesses make purchases over the internet. The e-commerce market is still a relatively young concept that will continue to grow. However, for e-commerce to be successful, it demands the on-time logistical support provided by the trucking industry.

Truck travel is growing at unprecedented rates - 3.5% annually, compared to 2.5% for all vehicles. Trucks now routinely approach 40% of the traffic mix on certain segments of Interstate highways at various times of the day. The truck portion of the traffic mix will likely continue to increase.<sup>30</sup> Because of the high volume of freight traffic on the Interstates, congestion and bottlenecks are becoming troublesome and a deterrent to shipping needs.

Over 15-billion tons of goods worth over \$9 trillion were mostly transported on Interstate highways in 1998. The volume of freight traffic has also grown dramatically in recent years. It is expected to increase by nearly 70% by 2020. The FAF estimates that 69% of urban Interstates will carry more than 10,000 trucks, on an average daily basis, in 2020 compared with 27% in 1998.<sup>31</sup> Freight transportation is big business with big money. When freight transportation underperforms, the American economy suffers because of higher prices in both transportation services and consumer goods. Reliable, predictable travel times are vital to freight distributors today. Figure 2.3.2 shows the predicted dramatic growth of truck travel on both urban and rural Interstates.

**Figure 2.3.2: Percentage of Highway Segments with over 10,000 Trucks Per Day, Comparison of 1998 to 2020<sup>32</sup>**



Growth in intermodal transportation has greatly contributed to the increase in Interstate freight. The container revolution, coupled with a growing trend in inland ports, has allowed trucks to quickly distribute cargo throughout the interior of the United States. Past generations tended to live on or near coastlines or rivers as waterborne shipping was the primary, most cost-effective mode of transporting goods. The onset of the railroad allowed people to move inland as it assumed the role of distributor. The automobile and Interstate spread out the country even more. Today, the trucking industry is primarily responsible for distributing the goods throughout the country.

### **2.3.3 New Routes**

The Interstate system currently consists of 46,837 miles, and while construction of new Interstate roads is being planned or is currently underway, the majority of efforts now lie in maintaining and/or expanding capacity of the current system. Beginning with the passing of ISTEA and continuing through today's SAFETEA-LU, funds are now characterized by state and local governments having more control over where and how dollars are spent.

While most states are focusing on increasing the capacities and quality of their current Interstates, some new Interstate Highways are being planned. But these routes are mainly being constructed for commercial freight purposes, not for personal automobile use. Two such projects include the Interstate-74 extension from Cincinnati, Ohio through southern Ohio, West Virginia, Virginia, North Carolina, and eventually to Myrtle Beach, South Carolina, and the Interstate-69 "NAFTA Highway" extension from Indianapolis, Indiana through seven states all the way to Laredo, Texas on the Mexican border. The Interstate Highway System has not stopped growing – it is just growing at a slower pace. The challenge with new Interstate construction is funding. Current appropriations are only maintaining the existing highways. We will never see highway construction at levels like in the 1950's and 1960's, but the system will continue to steadily increase in size.

### **2.3.4 International Trade and NAFTA**

International trade has dramatically risen in recent years. As the world becomes more "global", more and more countries are trading with the United States. This has placed a tremendous strain on our nation's port facilities and airport ports. The Interstate



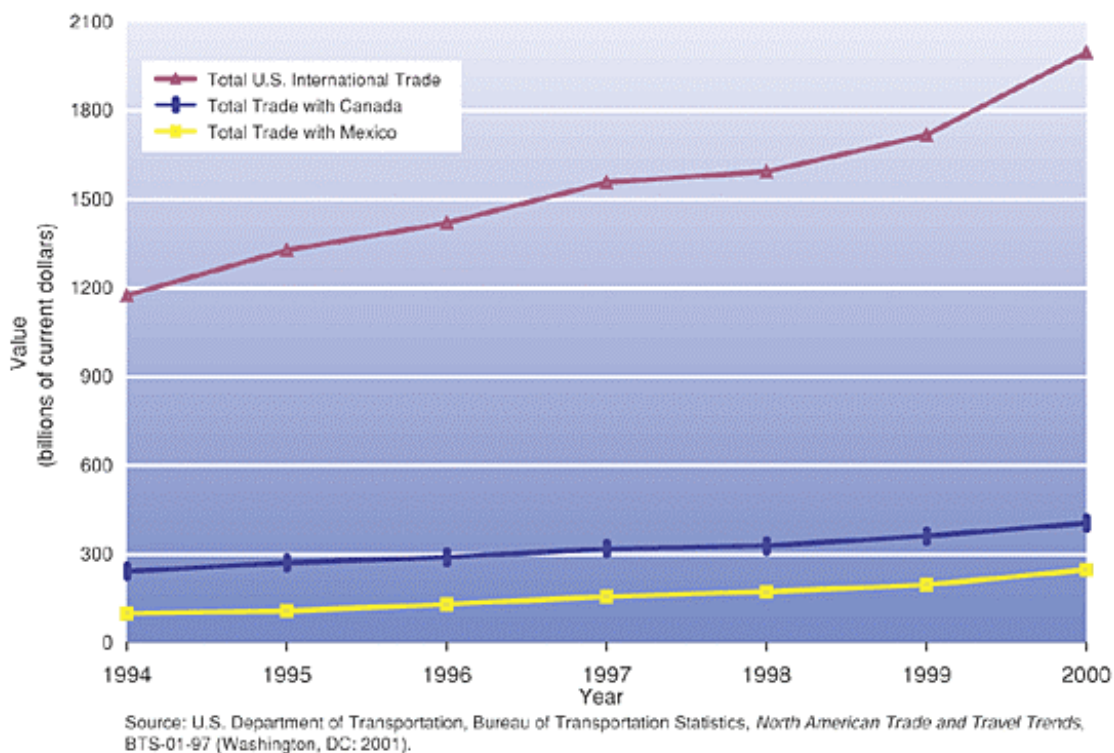
highways that connect coastal port facilities with the inland have become some of the most congested highways in the country.

Trade with European countries has grown a steady constant rate over the past 10 years. Forecasters predict similar growth in the coming decades. However, trade with China and the Far East has seen dramatic increases. In 2005 there was approximately \$675 billion of merchandise trade with Asia. By 2010, the U.S. is expected to have approximately \$1 trillion in merchandise trade. The rise in international trade will test the freight transportation systems in America.

Since the North American Free Trade Agreement (NAFTA) went into effect in 1994, trade with Canada and Mexico has risen by a remarkable 111% while total two-way trade between the United States and the rest of the world grew only 79%<sup>33</sup> These staggeringly high growth rates have created a strain on all Interstate corridors, but mainly north-south running highways throughout the United States. Traditionally, trade routes traveled east-west along the Interstate corridors and these Interstates were appropriately constructed with greater capacities. But the demand for shipments between Canada, Mexico, and the United States where there was none before has caused a demand in trucks moving freight between the three nations. Interstates 5, 15, 35, and 55, have especially felt the increase in VMT as they all provide a direct freeway connection from Mexico through the United States and into Canada. States have searched for solutions to increase the capacities of their north-south running Interstates as they were not originally designed to handle such high freight traffic.

The figure below shows the increased trade with International countries, Mexico, and Canada from 1994 to 2000. All have seen growth and will continue to in coming years.

**Figure 2.3.4: Value of U.S. Merchandise Trade with International Countries, Canada and Mexico: 1994 - 2000**



### 2.3.5 Estimates

The Interstate system carried 24% of the nation's travel in 2004. Its minimum of four lanes, gentle curves, paved shoulders, median barriers, rumble strips and reduced travel times between destinations make it the most safe and attractive route for drivers to utilize. Over the past century, freight trucking has moved from being a primarily short-run transport to operating long-haul transport. The Interstate allowed the trucking industry to obtain a market share in the long-haul business by allowing them to compete with the railroads.

The demand for highway freight transportation will continue to grow as population and economic activity increase. Over the next ten years, the U.S. economy is projected to increase by 38% and the U.S. population by 9%. During this time, transportation and warehousing employment is expected to increase by 22%, greater than the national average of 15%.<sup>34</sup> While most truck deliveries are made carrying commodities, about 20% are made with no product on board. Irregardless, the trucks take up room on Interstates, whether empty or full.

## ***2.4 Automobiles vs. Trucks: Competing for the Same Resources***

Unlike other modes of freight transportation, automobiles and trucks both compete for the same resource – space on roads and highways. This is unique to the Interstate system. In other modes of transport, private companies have relatively no competition for their path of movement. Airplanes fly in an open, unconstrained sky. Ships move on rivers, lakes, and oceans that are far from constrained and open to all. Railroads run on privately owned tracks. But freight trucks must operate on the constrained Interstate system and other roadways that must not only keep the trucks moving, but also move tens of millions of people driving their own automobiles. The economic stakes are magnified in that freight shares infrastructure with passenger traffic. Freight congestion adds costs to passenger travel and vice versa.

### 2.4.1 Safety Implications of Mixing Autos and Trucks

The Interstate system has long been known as the safest route of transport for a vehicle. An important feature of the Interstates is the uniformity in design practice that assures safety and efficient operations. Geometric design, pavement and bridge design, and other, newer features such as rumble strips and cable median barriers all contribute to making the Interstate the safest type of road to travel. Even though the Interstates make up only 3% of the nation's roadways, they carry almost 24% of the nation's highway travel and they accounted for only 14% of the country's traffic fatalities. In 2004, the traffic fatality rate per 100 million miles of travel was only 0.80 on Interstate Highways. On non-Interstate routes, the rate was 1.46.<sup>35</sup>

**Table 2.4.1: Fatality Rates per 100 million vehicle miles**

<b>Fatality Rates per 100 million vehicle miles</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
<b>Rural</b>	4.40	3.35	2.97	2.57	2.55	2.48	2.39
<i>Interstate</i>	<i>1.68</i>	<i>1.39</i>	<i>1.35</i>	<i>1.20</i>	<i>1.25</i>	<i>1.27</i>	<i>1.23</i>
Other Arterial	4.67	3.51	2.99	2.70	2.50	2.47	2.38
Collector	5.28	3.97	3.68	3.13	3.10	3.00	2.94
Local	5.91	4.84	4.45	3.76	4.33	3.88	3.70
<b>Urban</b>	2.52	1.85	1.47	1.20	1.15	1.07	1.01
<i>Interstate</i>	<i>1.35</i>	<i>0.94</i>	<i>0.81</i>	<i>0.63</i>	<i>0.66</i>	<i>0.63</i>	<i>0.61</i>
Other arterial	2.63	2.17	1.68	1.34	1.29	1.21	1.15
Collector	2.68	1.89	1.34	1.14	1.00	0.89	0.79
Local	3.46	1.93	1.78	1.62	1.53	1.38	1.28

But in spite of the great safety record of Interstates, state DOTs and transportation planners are concerned over the increase of freight travel on the Interstates and the safety implications it brings. Large trucks account for a disproportionate share of traffic deaths based on miles traveled. While trucks make up just 4% of all registered vehicles and 7% of all vehicle miles traveled, they are involved in 11% of all crash fatalities.<sup>36</sup> According to the National Highway Traffic Safety Association, the number of persons killed in crashes involving large trucks increased by 3.1% from 2003 to 2004. This was an increase for the second consecutive year.

Statistically, truck drivers are safer than automobile drivers. In fatal crashes, large truck drivers had only 1% of their drivers test positive for blood alcohol concentration (BAC) of .08 as compared to 22% for passenger cars and 27% of motorcycles. Truck drivers also were less likely to have a previous license suspension or revocation than were car drivers. So while truck drivers are statistically safer than automobile drivers, the sheer sizes and weights of the trucks cause them to be more destructive in crashes.

Recent trends in the trucking industry involve including an event data recorder (EDR) in order to gather a variety of vehicle events data surrounding a crash or near-miss incident. Events that trigger an EDR include sudden deceleration, air bag deployment, or manual activation by the driver. Other studies point to dedicated truck only lanes or slower speed limits for trucks as potential safety benefits. Both have been met with much reluctance and scorn by the trucking industry.

Truck sizes have consistently grown over the past decades. Trailer lengths for tractor-trailers have moved from an industry standard of 40-feet in the 1960s to 48-feet in

the 1970s, to the current 53-feet in the late 1980s. Some states allow 57 and 59-foot trailers. The sheer size of some of the trucks on the Interstates is a safety concern.

Interstate Highways offer the safest route of transport for the freight industry. However, with trucks that are large and heavy, and more and more congestion, it is no wonder that truck incidents have grown in recent years. Even so, safety on the Interstate system needs to remain a focus in order for freight transportation to continue to grow, improve, and prosper.

#### **2.4.2 Capacity Implications of Combining Autos and Trucks**

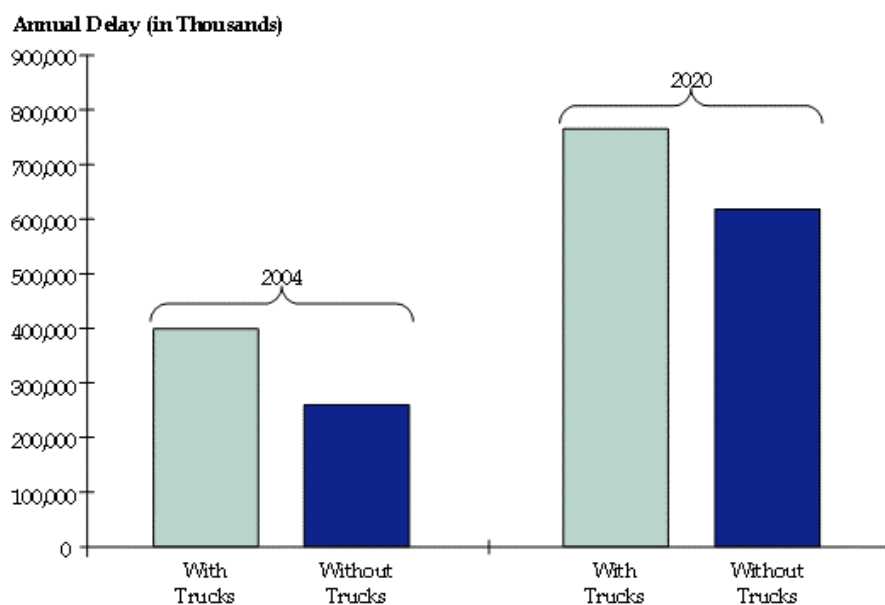
The competition for use of the Interstates by large trucks and motor vehicles is similar to another mode of transportation – railroads. Railroads operate as private corporations who own the trains, the tracks and the right of ways across the country. Uniquely, railroads are predominantly used to transport freight in America. Passenger trains must compete for unused capacity on train tracks. However railways differ from highways for one major reason. Rail operates on a limited, constrained system, whereas roads do not. Competition exists for train tracks, but one must possess a unique, dimension constrained, expensive rail car in order to utilize the resource.

In contrast to the railroad system, the Interstate system has vehicles that come in all different shapes and sizes, possess different acceleration rates and speeds, are operated by different people, and are all going different places. Highways operate as an open, unconstrained system that is available to anyone who possesses a motor vehicle. Since Interstates are shared by trucks and cars, it is impossible to separate freight capacity from the overall system capacity of serving all vehicles. Solutions to this issue have been

proposed, but no consensus has ever been made. Trucks and automobiles will continue to compete for space on highways for the foreseeable future.

Figure 2.4.2 shows the effect of trucks on delay at the 50 worst urban bottlenecks in thousands of hours. As the chart depicts, the simple presence of trucks at these bottlenecks causes significant delay to all travelers and is not proportionate to the number of trucks operating on the roads.

**Figure 2.4.2: Effect of Trucks on Delay at the 50 Worst Urban Bottlenecks<sup>37</sup>**



## 2.5 Summary

The Interstate system has served as the safest, fastest, and most cost-effective route of transportation for both automobiles and trucks over the past 50 years, but it is facing several growing concerns. The current 46,837 mile system continues to work, but all concede it will struggle to handle the challenges of the 21<sup>st</sup> century if not addressed

properly. Many challenges exist that will have to be addressed by transportation planners and state DOTs in the near-future. The next chapter presents the initiatives and ideas being undertaken by states with regard to transportation planning and the Interstates.



## Chapter 3: A Review of State DOT Interstate Initiatives

“Thus, in overcoming the difficulties of the overcrowded and over-extended city, the suburb proved to be both a temporary and a costly solution. As soon as the suburban pattern became universal, the virtues it at first boasted began to disappear.”

- Lewis Mumford, *The City In History*, 1961

### 3.1 Methodology

As the Interstate system continues to become more and more congested, many ideas exist as to what should be done to maintain and improve it. Often, private companies lobby that their “solution” will solve all of the problems associated with the Interstate. For example, railroad companies feel moving freight off of the highways onto trains will alleviate all of the traffic problems on the Interstates. Of course, funding for new train tracks, tax benefits, and increased revenues must accompany this alternative too. Therefore, in order to gain an unbiased assessment of where the Interstate is and what its future looks like, one must analyze the attitudes and perspectives of state DOTs, since they are charged with maintaining the Interstate systems within their states.

A review of current practices in states was made to determine options being used or planned. For this study, four different sources were used to gather the information:

- AASHTO – AASHTO and FHWA recently held a conference that included State Department of Transportation freight officials, FHWA Division Office staff, U.S. DOT headquarters staff, and private sector freight representatives. Prior to the conference, they conducted a survey of freight professionals in State DOTs to learn about their perspectives on

freight transportation priorities and needs. These results and other AASHTO gathered information are used in this study.

- TRB – The Transportation Research Board conducts annual visits to State DOTs in order to identify current issues, collect and generate information on the issues, and disseminate the information throughout the transportation community. TRB staff members meet on-site with representatives of each state’s DOT. Results of their visits are published annually in their professional journal – TR News.
- University of Virginia (UVA) State DOT Survey – As part of this research, a questionnaire was sent to representatives of each state by electronic mail. (See Appendix A) The questionnaires were sent to 25 states with 10 states responding.
- State initiatives – New, successful initiatives that forward thinking states have used in recent years were studied. Washington State’s Freight Action Strategy (FAST) corridor, Florida’s Strategic Intermodal System (SIS) program, and Indiana’s leasing of its toll road were analyzed.

The following discussion summarizes the current practices being used to assist freight transportation and the Interstates in the United States.

### **3.2 AASHTO**

The AASHTO-FHWA Freight Transportation Partnership hosted a meeting of State Department of Transportation freight officials, FHWA Division Office staff, U.S. DOT headquarters and staff, and private sector representatives in April, 2005 in order to

define a position description framework for a State-Level Freight Coordinator. The need for a State-Level Freight Coordinator was determined through outreach with both the public and private sectors by FHWA between 2000-2002. Authorized under SAFETEA-LU, the coordinators provide each State a person dedicated to making freight transportation improvements.

Prior to the AASHTO conference,<sup>38</sup> a survey was sent to state DOTs with 46 states responding. The freight partnership survey revealed that 19 of the 46 states (41.3%) held freight transportation as an extremely important priority. Another 41.3% felt that freight transportation was only somewhat important. And 8 of the 46 states (17.4%) were either neutral or felt it was not very important.<sup>38</sup> These statistics typify the complexity of our vast country and its different attitudes and needs. Finding a common attitude towards freight movement and the use of Interstate system is very difficult.

AASHTO's Freight Transportation Partnership Synthesis Report included responses from states on what hot freight issues they foresee in the next 5-10 years. The states reported that the U.S. would see:

- Higher truck volume
- Expansion of public/private partnerships for funding of freight projects
- Development of a National Transportation Policy regarding freight
- Rail infrastructure/relocations
- Modal diversion
- NAFTA corridor impacts safety/security issues
- Development of multi-state freight strategies

The Synthesis Report also found that educating stakeholders, including the general public, about freight transportation needs is important to the future of the Interstates and freight transportation.

The AASHTO survey and conference identified a number of organizational and institutional issues. The identified issue areas and solution ideas are shown in tables 3.21 and 3.22. Highlighting the list of issues the states agreed upon are that freight projects are overlooked in the political process and the lack of regional/multi-state coordination.

**Table 3.21: State DOT Issue Areas**

Issue Area
1. Lack of dedicated funding for freight projects.
2. Organizational structure is not conducive to freight needs.
3. Difficulty in getting the freight stakeholders to the table and keeping them there.
4. Freight projects are overlooked in the political process.
5. Lack of data.
6. Lack of regional/multi-state coordination.
7. Lack of understanding of economic development.

**Table 3.22: State DOT Solution Ideas**

Solution Ideas
<ul style="list-style-type: none"> <li>• Integrate freight awareness into all planning. Provide freight understanding into the different planning activities of existing programs/projects.</li> </ul>
<ul style="list-style-type: none"> <li>• Develop and implement a national freight transportation plan, policy and funding.</li> </ul>
<ul style="list-style-type: none"> <li>• Create 3 types of corridors – national significance, multi-state significance, and regional significance.</li> </ul>
<ul style="list-style-type: none"> <li>• Provide a mechanism for overcoming highway specific funding processes. A flexible funding source is needed to deal with the private sector to expedite freight projects that do not fit under highway projects.</li> </ul>
<ul style="list-style-type: none"> <li>• Address freight issues proactively, show positive outcomes and the negative outcome of doing nothing.</li> </ul>

Freight corridor studies are taking place in multiple states and across state borders. In one example, California, Arizona, New Mexico, Texas, Louisiana, Mississippi, Alabama, and Florida joined together and completed the Interstate-10 Freight Corridor Study in 2003. The study assessed the importance of freight on I-10 and evaluated strategies to facilitate freight flow within the corridor. Several other corridor studies are planned or are underway and involve multiple states.

AASHTO supports several strategies that relate to freight transportation on the Interstates. They continue to push for congressional approved funding that allows states and their counties and cities to increase their resources dedicated to improving the movement of freight. AASHTO believes the apportionment of money distributed to each state for interstate maintenance, bridge, surface transportation, and other programs should be delegated to the states and their local governments as to how to spend the funds. This

gives states more leverage to spend money in areas of concern as determined by them – not the federal government.

AASHTO also adamantly believes there is a need for leadership and focus to improve and better integrate freight considerations into the statewide and metropolitan planning transportation planning processes. The freight planning tools and techniques available to states and local planners are in need of improvement so that proper decisions can be made on freight transportation issues. AASHTO feels the research conducted on freight transportation has not kept up with the ever-changing and complex world of freight movement. Better communication between public and private sectors is necessary in order for planners to place a greater emphasis on freight transportation.

Innovative financing and investment in freight transportation infrastructure will also be necessary in the future as standard source public investments will not be adequate. AASHTO approves such methods as pooling of funds from different federal programs for multimodal projects, tax incentives for investment in freight rail and intermodal infrastructure, and the investment in freight corridors.

AASHTO and FHWA both support a plan to develop a national education program that specializes in freight. They feel that transportation planners at MPOs, government officials, DOTs, and other professionals need to become smarter about freight transportation's unique characteristics and needs. Topics such as emerging freight trends, benefits and costs of investments, forecasting growth, planning and financing improvements, and trip generation form the foundation of a minimum knowledge base required of planners.

### **3.3 TRB**

Each year the Transportation Research Board conducts a field visit program that visits each state DOT. The results of the visits are published annually in TRB's publication TR News. Several findings over the past few years point to a shift in attitude of states towards freight transportation and the Interstate system. Their findings include:

- Partnerships and communications between resource agencies, MPOs and transit providers, and local agencies are critical to achieving state DOT missions.
- Obtaining and using freight transportation data are substantial challenges for state DOTs, MPOs, and metropolitan areas. Data for trucking, the largest mode of freight transportation, is least available.
- As highway infrastructure providers, states must partner with private sector carriers and shippers to provide adequate system capacity.
- Critical needs at state DOTs include management and staff capabilities to deal with the private sector and other public agencies, and funding for improving freight flow.
- Marine terminals in Los Angeles and Long Beach have collaborated to implement a program that imposes a peak-hour fee. The program has shifted one-third of port-related truck traffic to off-peak hours.
- Many states are considering tolls or congestion pricing to improve the use of capacity. Its impacts on the trucking industry are subjects of debates and studies.
- A Georgia study concluded that truck-only lanes could produce up to 20% more relief than HOT or HOV lanes.

- Significant education is necessary for many planners and decision-makers to understand the demand for freight transportation because of the complex decision making by private sector shippers, carriers, and logistics providers.
- Because of an array of public and private beneficiaries, freight projects are difficult to prioritize through traditional planning and programming. A better prioritization process is needed.

TRB also reports that truck volumes are pushing capacity limits on many Interstates. Trucks now comprise about one-fifth of the Interstate traffic volumes and will increase to one-quarter by 2020.<sup>39</sup> In Arkansas, 60% of the volume on Interstate-40 between Little Rock and Memphis, Tennessee now consists of trucks.

The annual TRB Field Visit Program found that states are now acknowledging the importance of a public/private relationship. Forming a sound working relationship offers benefits to both parties - the American public and freight shippers. Cooperation and communication between the private and public sectors is becoming increasingly important for today's transportation needs. Since the Interstate system and rail lines have become fragile in their reliability for freight shippers, innovative solutions are necessary and cannot be accomplished without both parties participating in the process.

TRB's survey of states also found a need for local and state government transportation agencies to have a better understanding of evaluating and prioritizing freight projects. More credible objective analysis would allow agencies to include freight interests in transportation projects. Often, state highway programs set project priorities based on engineering criteria rather than economic criteria. TRB officials warn that this must change if viable solutions to congestion and freight movement are sought.



TRB lists congestion as one of its nine most critical issues in transportation on their 2004 list. They discuss the higher costs placed on shippers and consumers because of congestion. Longer travel times increase transport costs. TRB says that the overriding issue for freight policy is to maximize efficiency and to develop incentives for doing so.

### **3.4 UVA State DOT Survey**

A questionnaire was sent to 25 randomly selected states in the U.S. In most cases, the planning divisions of each state DOT received the survey. Ten responses were obtained. The states responding were: Arizona, Colorado, Georgia, Illinois, Kansas, Maryland, New Jersey, Oklahoma, Tennessee, and Virginia. The following sections describe the results obtained from each state.

#### **3.4.1 Arizona**

In order to address the growing freight movement on the Interstate system in Arizona, the Transportation Planning Division of the Arizona DOT will begin a Multimodal Freight Analysis Study in 2007. With strong support from the governor, the study will address trucking, rail, and aviation modes by conducting an inventory of the freight industry in the state, conducting an analysis of deficiencies in the current infrastructure, and developing a strategy for including freight as a factor in long-range planning. Arizona, one of the fastest growing states in the country, is also concerned about the ports of entry along the Mexico border and has been active in planning a CANAMEX corridor which will pass through the state.

Arizona is also taking steps to encourage passenger travel to take place off of the Interstates. Planners feel that the Interstate is being used for intra-city travel, decreasing its effectiveness in serving travel between regions. Therefore, they are restricting the spacing of interchanges to no less than two miles, planning for alternate routes to accommodate increasing demand, and providing financial assistance to local governments and counties to plan arterial networks that would handle the intra-city travel. Arizona is also completing a four-year I-10 Corridor Improvement Study that evaluated current Interstate conditions and is making infrastructure improvements to I-17, a major interstate commerce corridor for the state.

### **3.4.2 Colorado**

Like other states, Colorado has seen an increase in truck traffic and anticipates growth over the next 20 years. During fiscal year 2007, Colorado DOT will be collecting travel times on most of their congested corridors during both peak and off-peak times. Specific to this, CDOT will collect truck travel times on these corridors as well. With this data, CDOT feels they will be better able to prioritize their needs.

Colorado is looking to increase capacity in the Denver metro area in the coming years. They are also researching plans that would move truck traffic off of the Interstates and onto improved (super 2) primary roads. CDOT has already achieved success in this area with their work on the Ports-to-Plains Priority Corridor. The corridor, which connects Denver with Laredo, Texas, was labeled a high priority corridor in TEA-21 and is a cooperative effort between the Colorado, Oklahoma, Texas, and New Mexico DOTs. CDOT is also looking at participating in a new rail by-pass on the eastern plains of the state. The line would move rail traffic off of the mainline that runs along the Front Range

from Pueblo to Fort Collins. The new rail line would potentially have a positive effect on freight traffic along both the existing rail lines and Interstate-25.

### **3.4.3 Georgia**

Several states are working diligently to plan for the future. For example, Georgia, with over 1,253 miles of Interstate Highways – 9<sup>th</sup> most in the U.S., has conducted multiple studies over the last few years addressing the growing trend of freight movement, with a focus on trucks. Their Office of Planning’s “Statewide Transportation Plan” and “Statewide Freight Plan” were adopted in 2006 and report that trucking is by far the dominant mode for carrying freight in the state. Currently, trucks in Georgia carry 72% of the tonnage and 82% of the value of the goods being shipped. This is expected to rise to 79% and 86% respectively by 2035. Surprisingly, the increase in market share is to come at the expense of rail. The state reports that this is principally due to the commodities carried, which are high-value, time-sensitive goods that are more likely to be carried by truck.

Georgia is currently conducting a study to explore the possibility of truck-only lanes on its Interstate routes. The study will identify where truck-only lanes would be feasible in terms of overall transportation system planning, lane usage, available funding, community impact and land use consideration, and engineering considerations. Ultimately, the study will identify specific roadway corridors in Georgia where truck lanes are needed and can improve travel conditions for both freight movement and passenger cars. Currently, Georgia suffers from high levels of trucks and congestion in

Savannah because of the ports and in metro Atlanta because of its central location and road networks.

#### **3.4.4 Illinois**

Illinois is slowly adding capacity to its Interstate Highways in its most urbanized areas of Chicago and St. Louis Metro east. Twelve billion dollars have been identified for reconstruction and additional lanes on the Interstates. Located in the heart of the Midwest, Illinois faces deteriorating and heavily congested Interstates because of heavy truck traffic. The state continues to add infrastructure improvements to increase capacities in other areas as well. In November 2006, they completed a four-year \$500 million reconstruction of I-74 through Peoria that will greatly improve traffic and freight flows through the city.

But a more pressing freight concern for the state is relieving the rail congestion in Chicago. A plan called CREATE will potentially address 25 critical rail/highway grade separations, rail/rail separations, and improve track in the area. Though not yet funded, the \$1.5 billion program would greatly reduce the number of trucks operating on Chicago's Interstates by shifting much freight to rail.

#### **3.4.5 Kansas**

Kansas DOT is currently in the process of completing their Long Range Transportation Plan wherein freight will be significantly discussed. On their rural Interstates, the east-west running Interstate-70 currently handles 3,000-4,000 trucks per day and the north-south running Interstate-35 handles 2,500-4,500 trucks per day. The Kansas City metropolitan area moves 6,000-10,000 trucks per day on its network of

highways. But KDOT is doing little to address their Interstates, as congestion and deteriorating roads is not as pressing as in some other states. Currently, KDOT does not have a unit, bureau, or division of freight or resources allocated solely to freight issues and no investments are being put into planning for increasing traffic on Interstates.

Like other Midwestern states, Kansas produces bulk commodities that are predominantly moved by rail. Because of this, Kansas places more emphasis on establishing its rail networks. A freight rail infrastructure improvement loan program is in place to assist short line railroads with major infrastructure rehabilitation projects that improve operating efficiencies and service to shippers. Currently Kansas has no concrete plans to divert trucks off of the Interstates.

### **3.4.6 Maryland**

Maryland's miles of the Interstate system are among the most crucial and integral parts of the nation's economy with Interstate-95 running from Washington D.C. through Baltimore, and north to Philadelphia and New Jersey. In 2004, Maryland created the Office of Freight Logistics (OFL) to specifically bring attention to freight movements. The OFL works with all Maryland transportation modal administrations and agencies to improve traffic on 16,000 lane-miles of highways.

In order to help the flow of increased trucking, Maryland is planning infrastructure expansion on I-95 north by adding two toll lanes for a 10-mile stretch in the Baltimore area and tolling on a new limited access highway in Montgomery County. The Montgomery County road will relieve congestion from I-270 and I-95 in the Washington D.C. suburbs.

Another method Maryland is using for congestion relief is prompt clearing of accidents through their Coordinated Highway Action Response Team (CHART) system. CHART has proven successful in improving real-time travel conditions on the Interstates. Operating as a multi-jurisdictional program, it covers the entire state of Maryland. The comprehensive traffic management system operates from a state-of-the-art command and control center that functions 24 hours-a-day, seven days a week.

### **3.4.7 New Jersey**

New Jersey has worked hard to address highway and rail needs through system improvement and innovative strategies such as off-peak hour operations, mode shift, and short haul rail. While focusing on the only the commuter in years past, the state will soon be releasing its first Comprehensive Statewide Freight Plan that addresses problems and issues and offers solutions for all modes.

Because of limited funding resources, New Jersey has turned to alternative techniques as an attempt to improve freight flows. NJDOT has worked with the Port Authority of New York and New Jersey to use off-peak times for freight movements and to extended hours of operations. As perhaps the most densely populated and congested area in the U.S., northeastern New Jersey must use innovative methods to combat the growing congestion on Interstates.

The state is also pursuing the Liberty International Transportation Corridor, a corridor that generally follows the spine of the Jersey Turnpike, and the Portway Extensions Concept, which takes freight away from the congestion of northeastern New Jersey. The Portway is a series of 11 independent NJDOT projects that will improve access to and between the Newark-Elizabeth Air/Seaport Complex, intermodal rail

facilities, trucking and warehousing/transfer facilities, and the regional surface transportation system. The projects will relieve the current high levels of congestion and promote economic development in the area.

### **3.4.8 Oklahoma**

As a predominantly agricultural state, Oklahoma depends greatly on train transportation to move its bulk commodities. However, congestion affects their Interstate system in the cities of Tulsa and Oklahoma City. Currently, the state is working to maintain the current system, but they are looking at capacity expansions in heavily congested areas.

In 2005, ODOT released their 2005-2030 Oklahoma Statewide Intermodal Transportation Plan. This plan examines how the future transportation infrastructure will aid Oklahoma's economic development. Specifically, the plan identifies Freight Operational Improvement Corridors that represent high truck traffic routes. Corridor studies and improvements are planned along these routes in the coming years.

### **3.4.9 Tennessee**

Tennessee reports that the movement of freight on highways and rail in both rural and metropolitan areas has become an issue of major concern. TDOT's Long-Range Transportation Plan projects a 104% increase in truck trips in Tennessee between 2003 and 2030. Because of this, the state is working to ensure planning is a coordinated effort between MPOs and the responsible state planning division. Tennessee wants to ensure that the planning for increased freight traffic begins now.

Tennessee's DOT is in the process of developing a research project that would provide for assistance in freight planning studies for MPOs in the state. It would assist the MPOs by identifying immediate problems that could be brought to the attention of local planners, TDOT planners, and traffic engineers for timely action. The benefits of the plan would include the development of comprehensive plans and methods to deal with the growth of freight movement within the state. Additionally, it would foster cooperation on freight issues at the MPO, regional, state, and multi-state levels.

Tennessee's population is projected to grow faster than the national rate and will put increasing pressure on their transportation systems. The population growth, coupled with the fact that Memphis is the home of FedEx, the largest air freight company in the world, has led TDOT to aggressively begin tackling their freight trucking challenges.

### **3.4.10 Virginia**

Virginia indicated that it has been in the process of addressing freight movements on a corridor basis for about ten years. While initially concerned only with increasing heavy truck traffic on Interstate-81, the planned expansion of the Port of Virginia has motivated the state to think more proactively towards the issue of freight movement. Earlier this year, VDOT hired Cambridge Systematics to conduct a Statewide Multimodal Freight Study that will evaluate the transportation system specifically to address the needs of freight shippers and freight mobility through the year 2035.

The state has also aggressively pursued rail corridors parallel to Interstates that will attract freight and reduce trucks on the highways. While already possessing the successful Virginia Inland Port, the state is pursuing a north-south running freight rail line to capture freight off of Interstate-81, as well as holding talks with CSX railroad



about developing a “Heartland Corridor” that would increase capacity to move freight out of the Port of Virginia to the Midwest. The contracted Freight Study will identify and make recommendations on which corridors to pursue improvements on for the most substantial benefit. In addition to the Freight Study, the Virginia Legislature and the Commonwealth Transportation Board are currently working to come to an agreement on how the needs of freight congested highways can be met.

### 3.4.11 UVA Survey Summary

Opinions on the future of Interstate Highways among the surveyed states varied. However, all concurred that the Interstate would remain the backbone of freight transportation in the years ahead. Several states see rail transportation needing to play a larger role in moving freight. The table below highlights the actions being taken towards improving freight movements:

**Table 3.41: Highlights of UVA State DOT Survey**

<b>State</b>	<b>Action and Investment Towards Freight on Interstates</b>
Arizona	Will conduct a Multimodal Freight Analysis Study in 2007. Working to preserve the Interstates as intercity routes by decreasing intracity travel.
Colorado	Collecting travel times on congested corridors in order to establish priorities. Looking at plans to move truck traffic to improved primary roads. Capacity increases.
Georgia	Multiple studies – Statewide Transportation Plan and Statewide Freight Plan Study – show that trucking is the dominant mode of carrying freight in GA. Currently conducting a study to explore the need for truck-only lanes. Focusing on congestion relief for the Savannah ports and corridors in the metro Atlanta area.
Illinois	Adding capacity to metro areas in Chicago and East St. Louis. Have identified \$12 billion in needs for reconstruction and increased capacity.
Kansas	Working on Long Range Transportation Plan – freight will be a component of the plan. No significant investment into planning for freight. Investigating ITS technology in the Kansas City area.

Maryland	Created the Office of Freight Logistics within MDOT in 2004 to specifically bring attention to freight movements. Adding two toll lanes on I-95 in the Baltimore area. E-Z Pass and PrePass help trucks move fluidly through chokepoints such as tollbooths and weigh stations.
New Jersey	Will soon publish a Statewide Comprehensive Freight Plan. Portway projects relieving congestion in New York metro area. Looking for creative ideas to manage freight in northern NJ.
Oklahoma	Maintaining the current system and looking at some capacity expansion.
Tennessee	Developing a project that would provide assistance in freight planning studies for MPOs in the state. Plan would identify immediate problems that could be brought forward for timely action.
Virginia	Outsourced a Statewide Multimodal Freight Study that will comprehensively evaluate the transportation system and address the needs of freight shippers. Investigating rail corridors parallel to Interstates.

In addition to responding to questions regarding the actions and initiatives taking place in their respective states, states responded to two questions: 1. Indicate how important planning for freight transportation is on the Interstate Highways in your state, and 2. Indicate the level of concern for congestion on your state's Interstate Highways. Five of the ten states responded that they were extremely concerned about congestion on the Interstates. The results are shown in the table 3.42 below.

**Table 3.42: UVA State DOT Survey Results**

State	Importance of planning for freight transportation on Interstates	Level of concern for congestion on Interstates
Arizona	Very important	Extremely concerned
Colorado	Very important	Extremely concerned
Georgia	Extremely important	Extremely concerned
Illinois	Slightly important	Moderately concerned
Kansas	Slightly important	Very concerned
Maryland	Very important	Extremely concerned
New Jersey	Very important	Very concerned
Oklahoma	Very important	Moderately concerned
Tennessee	Very important	Extremely concerned
Virginia	Very important	Very concerned

Perspectives taken from the survey on the future of the Interstate Highway System include:

- A freight-only system will evolve with dedicated truck lanes in rural areas and tiered with tunnels or overheads in urban areas.
- The Interstate will become the main source of freight transport in the U.S. and will see significant expansion through expanded capacity and dedicated truck lanes.
- The Interstate system will play a critical role in a state maintaining a competitive economic advantage in the international and domestic marketplace. Managed Lane variations such as High Occupancy Vehicle, High Occupancy Toll, Express Toll Lanes, Truck-Only Lanes, and Truck-Only Toll Lanes would reserve mobility choices by applying tools such as pricing, eligibility, and/or limiting system access.
- Expansion of the Interstate Highway System will diminish as the cost of land and materials increase. Expansion of rail and domestic shipping operations is more likely to occur.
- Rail will play a larger role in the movement of freight and the Interstate will be maintained at its current state.

Among strategies discussed in the survey, funding remains an issue with implementing programs. Three of the states mentioned lack of finances as reasons projects were suffering or remaining on the table. Multiple states face a funding crisis and are attempting to be creative in their approach to moving freight.

### **3.5 State Initiatives to Address Future Freight Travel**

In addition to the AASHTO, TRB, and UVA sources, initiatives already started by different states were examined. By 2020, the nation's total output of goods and services will increase by 70%, highway travel and all domestic freight traffic will increase by about 40%, and international container traffic may more than double.<sup>40</sup> Several states have already taken action that addresses the increasing freight traffic. The origins and destinations of freight shipments usually begin or end in cities – where ports, airports, or railheads are located. The freight must compete with passenger traffic for the use of the Interstate facilities. The states of Florida and Washington have implemented programs that can serve as examples for other regions in the country which help alleviate this complication. Additionally, Indiana has taken a new approach to funding by leasing their toll road to a private corporation.

#### **3.5.1 Washington's Freight Action Strategy**

Washington State has initiated a corridor project in the Seattle/Tacoma area called the Freight Action Strategy (FAST). FAST is a joint activity of the Washington State Department of Transportation (WSDOT) and the Puget Sound Regional Council (PSRC) that works to improve freight mobility on the north-south corridor connecting Seattle to Tacoma. The freight traffic, coupled with road traffic and limited land access, places a severe constraint on port development. Improvements were needed in order to increase the physical capacity of the current port terminals as well as reduce the impacts of freight traffic on residents, automobile traffic, and businesses.

The ports of Seattle and Tacoma comprise the third largest freight container complex in the United States. FAST's objectives are to move freight through the

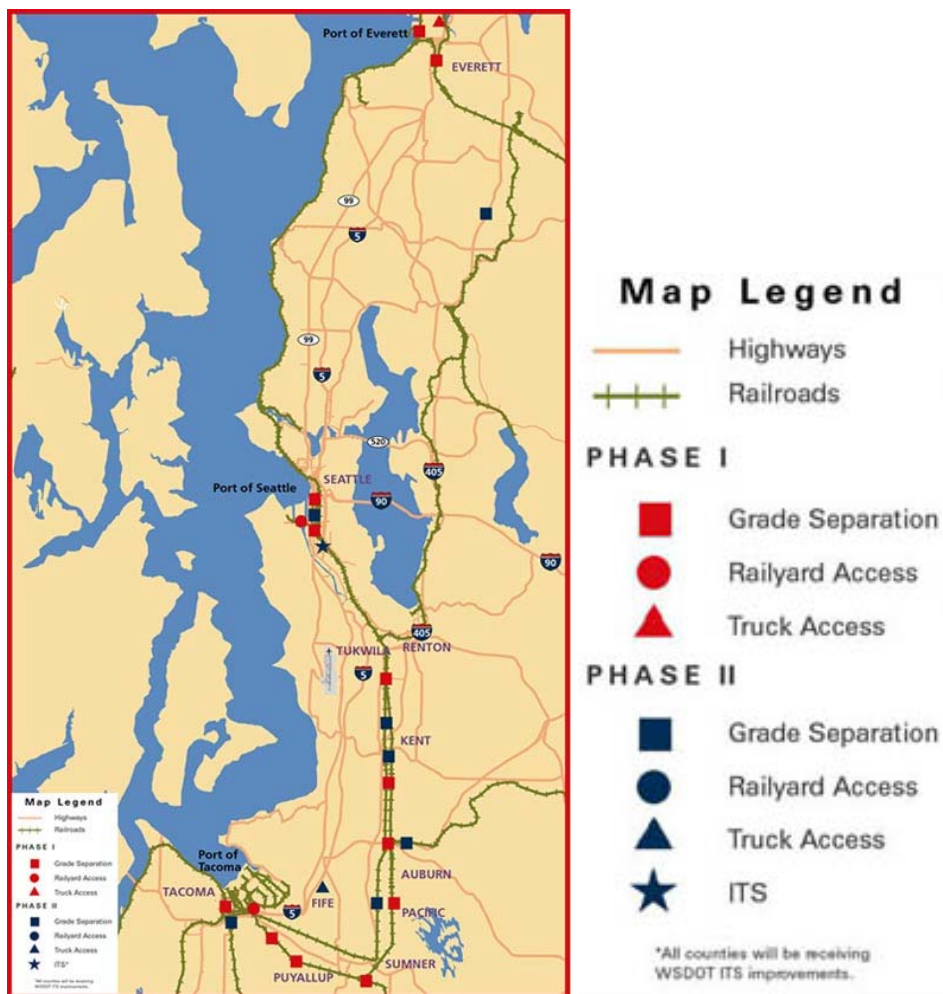
northwest trade corridor, fix freight and general traffic bottlenecks, increase the competitiveness of Puget Sound ports, and improve the safety of rail/roadway crossings. With Asia being its main supplier, container traffic is expected to double over the next twenty years. The corridor, running along a narrow strip of land east of Puget Sound, connects three deepwater ports, two major airports, and includes the heavily traveled Interstate-5, which traverses the west coast from San Diego, California to Vancouver, Canada. While jointly run by WSDOT and PSRC, FAST also partners with the federal government, twelve cities, three counties, three ports, and several businesses to include Burlington Northern/Santa Fe and Union Pacific Railroads, and the Washington State Trucking Association.

Funded in 1999, FAST is broken up into two phases which identified improvements throughout the corridor and prioritized them. Phase I projects included a collection of railroad grade crossings and port access improvements. Phase II projects include truck-related issues and operational characteristics among roads, railroads, and intermodal facilities.<sup>41</sup> The common theme is achieving a freight mobility vision. Since the region is connected by only one north-south running Interstate (I-5) and one east running Interstate (I-90), the FAST Corridor initiative will greatly improve the historically congested highways and improve freight movement both on the Interstates and railways in the northwest U.S. Bolstered by the successes of the Phase I projects, FAST is now competing for federal funds which will support Phase II projects.

Unique to the FAST Corridor program is the selection of projects based upon their strategic importance. The FAST Partnership does not allocate secure funds, but rather moves forward on projects that have strategic importance to freight movement in

the region. The partnership has been able to use financing flexibility in order to get projects started and completed in a short period of time. Past policies asserted that local and state governments do not prioritize projects important for freight mobility. This can be attributed to government officials not understanding freight needs and the fact that the projects are usually complex, involving many different transportation modes, multiple jurisdictions, and private industries. Creating a solidified regional team with a common vision and goal is proving to be an ideal method of securing funding and getting results.

Figure 3.5.1: FAST Corridor<sup>42</sup>



### 3.5.2 Florida's Strategic Intermodal System

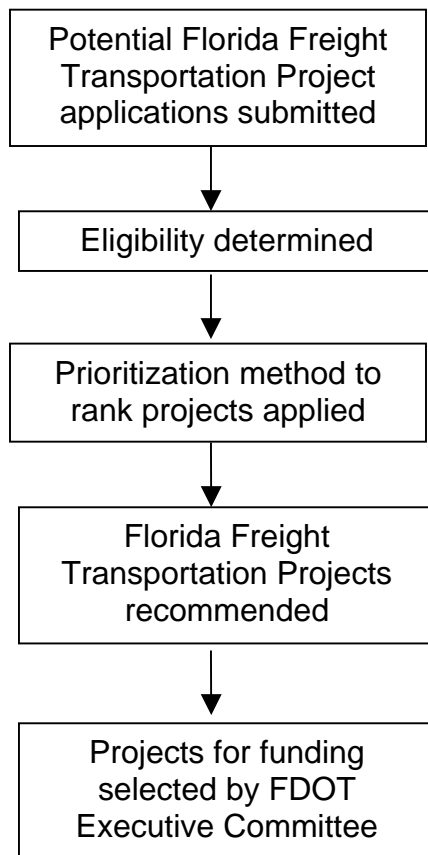
Florida has also been active in solving freight transportation issues. Organized as a result of the 1998 Governor's Intermodal Transportation Summit, the Florida Freight Stakeholders Task Force identifies and prioritizes freight-related transportation projects for fast-track funding. Similar to FAST, the task force members are comprised of port and airport authorities, MPOs, state and local government agencies, shippers, and carriers. The work of the task force led to Florida adopting the Strategic Intermodal System in January, 2005.

The initial task force determined two primary objectives for Florida:<sup>43</sup>

1. Assess the current state of the freight transportation system and recommend freight transportation projects for "fast-track" funding.
2. Develop recommendations for the Year 2020 Florida Statewide Intermodal Systems Plan that would address Florida's freight transportation interests.

When assessing the current state of freight transportation, the task force combined with FDOT and the Center for Urban Transportation Research to identify and assess the existing intermodal facilities. Next, they defined the Florida Strategic Freight Network as the combination of the Florida Interstate Highways, major freight facilities, and the roadways to the Interstate network. They also developed and prioritized a list of projects for "fast-track" funding.

The prioritization of projects followed a method that was derived from Florida's Metropolitan Planning Organizations, several investment studies, and parts of a Washington State study. The framework is shown in Figure 3.5.2.

**Figure 3.5.2: Florida Framework Prioritization Methodology**

The task force also developed project eligibility criteria before projects would be looked at for consideration. They included:

- The project had to be located on the Florida Strategic Freight Network.
- The project had to be primarily aimed at reducing barriers to freight movement or mitigating the impact of freight movement on communities.
- The project had to demonstrate a total public benefit divided by total public cost equal to or greater than one based on the specified benefit-cost approach.

Ultimately, projects were selected for “fast-track” funding based upon prioritization criteria. The criteria included benefit/cost ratio, stage of compliance/environmental



compliance, time to complete project, current LOS or actual AADT / capacity at FDOT LOS standard, actual/critical safety rating, neighborhood impacts of projects, daily freight volume in truck trailer equivalent units.

The work of the task force led to the Strategic Intermodal System (SIS). The SIS is a transportation system that:

- Is made up of statewide and regionally significant facilities and services
- Contains all forms of transportation for moving both people and goods, including linkages that provide for smooth and efficient transfers between modes and major facilities.
- Integrates individual facilities, services, forms of transportation and linkages into a single, integrated transportation network.

In working to develop Florida's highways, approximately \$2.2 billion of capacity improvements are under construction for SIS highways. Most of this will be dedicated to the Interstate highways that are all a part of the Strategic Intermodal System.

The work done in Florida serves as a model for other regions across the United States. Their efforts to improve freight transportation will not only benefit the Interstate system throughout Florida, but will also improve the flow of commodities across the state and to other areas of the southeast U.S. Florida is accomplishing this by using a systematic, priority-based approach that involves planners and stakeholders at all levels, with a common focus on improving freight movement through all modes.

Both the FAST Corridor and Florida's Strategic Intermodal System illustrate how good planning, teamwork, and a focus on freight movement can facilitate freight movement and identify projects that will not only benefit automobiles and trucks on

Interstate Highways, but also people because of streamlined freight movements.

Transportation agency and government awareness of freight needs must continue to grow in the coming years. Most local and state governments do not have methods for evaluating or prioritizing freight projects. Often, only projects aimed to benefit the general public are pursued. But as Florida and Washington are proving, managing freight movements will benefit everyone.

### **3.5.3 Indiana Toll Road**

Indiana has become a leader in transportation policy as evidenced by its recent lease of the 157-mile Indiana Toll Road to the Spanish-Australian group Macquarie-Cintra. In 2005, faced with a decaying highway network, Governor Mitch Daniels introduced a plan to privatize the Toll Road in order to fund his ambitious “Major Moves” transportation investment plan. Macquarie-Cintra paid \$3.85 billion for the 75-year lease and assumed operation of the road from INDOT on June 30, 2006.

The lease of the road was completed in an astounding 117-day bid process and is the largest agreement of its type. The company would collect all of the toll revenue in return for its up-front payment. The large cash payment allows Indiana to earn interest on the money. It also allowed the state to relieve \$225 million in debt. The deal allows the earned interest money to be placed into transportation projects throughout the state each year.

The agreement is significant in that the Indiana Toll Road rarely turned a profit for the state. The Toll Road was facing significant maintenance costs as well – costs that have now shifted to the contractor. Any profit from the road would never have been

large enough to relieve Indiana of its \$225 million debt obligation. The lease of the road freed up the state to have cash on hand in order to fix transportation issues today.

The agreement called for the contractor to spend more than \$200 million in capital upgrades in the first three years and over \$4.4 billion during the life of the lease. Indiana can also expect to earn over \$800 million in interest during this time. The contract benefits the residents of Indiana, as well as users of its highways because it enables the state to act many years faster on much needed projects. The risk to the state of Indiana seems to have been mitigated in the deal. All of the money was paid up front. Cost overruns or inadequate revenues from the Toll Road are the responsibility of Macquarie-Cintra and not the taxpayer. A 263-page contract protects other public interests such as placing limits on toll rates. It also established defined performance levels that the contractor is legally required to meet such as time deadlines on removing dead animals or filling potholes. The contract also allows Indiana to revoke the deal at any time should the contractor fail to perform, but will never have to forfeit the \$3.85 billion payment.<sup>44</sup>

Major Moves is a \$10.6 billion transportation plan that doubles new construction spending on projects important to the state's economic growth and prosperity.<sup>45</sup> The money will be split between preservation projects and new construction over the next ten years and includes two bridges over the Ohio River, a quicker start and completion time to the Interstate-69 expansion from Indianapolis to Evansville, and constructing a "Fort to Port" highway from Fort Wayne to the east and towards Ohio and Lake Erie. Similar to Florida and Washington, Indiana for the first time is using a weighted scoring formula to prioritize projects.

While the ultimate success of this transaction will not be known for many years, many states are taking notice of Indiana's action and will most likely copy some of the strategies used in this deal. One cannot fault Indiana for taking the initiative to do something about the condition of the highways and the need for additional capacities on the roads. Governor Mitch Daniels said, "We can become the nation's distribution and logistics capital. This plan is important for our metropolitan areas, but is also necessary to help our small towns and rural areas flourish and fully participate in our growth."<sup>46</sup> Some other states, such as Texas, Virginia, and Oregon, are starting partnerships with private companies to build new roads or add toll lanes using mostly private funds and in April, 2006, Utah became the 23<sup>rd</sup> state to enact a law that allows private firms to finance, build, and operate toll roads.<sup>47</sup> Certainly, privatization has become a new way for fiscally-strapped states to finance highway infrastructure.

### **3.5.4 International Border Crossings**

Another project is taking place along the Washington State and British Columbia border. Improvements to the I-5 – SR 543 junction are currently being implemented with the addition of a truck lane and a new interchange which will increase safety, improve freight movement and relieve congestion.<sup>48</sup> The Blain, Washington crossing is the third highest volume of passenger traffic and fourth highest volume of commercial trucks along the U.S. – Canada border. Border congestion costs trucking companies almost \$22 million a year at this crossing alone. The project is being funded through the 2003 Washington State Legislature and is expected to be completed by fall 2008. Similar efforts are being addressed at other crossing points along both the Canadian and Mexican borders in order to alleviate the congestion of trucks.

### **3.6 Summary**

The most telling issue discovered from AASHTO, TRB and the survey was the urgency for states to begin addressing Interstate needs today. Some states already possess freight transportation planning departments within their DOT, but many are still in the beginning stages of understanding their highway freight needs. In the past, freight transportation issues were handled at the ports, on railroads, and along waterways. But as Interstate highway capacity is dwindling, new methods are needed to solve freight movement problems on the roadways of the country.

The results gained from the DOT surveys and initiatives study possess several commonalities to current published solutions for freight transportation, but they also brought out some new promising ideas. All agencies are now realizing that planning for increases in freight travel on the Interstates is necessary in order to maintain a high level of service on the Interstates. They also see the promise of involving the private sector in freight planning. The next chapter analyzes the options available to the states for freight traffic on the Interstates.

## Chapter 4: Analysis of Future Options for the Interstate

“The whole issue of how we manage congestion in the future is going to be critical. How do we continue to get additional capacity out of the system, recognizing the constrained environment that we work in and live in?”

- Eric Keen, National Transportation Director for HDR Engineering Inc.<sup>49</sup>

Many people have opinions on what the Interstate system might look like in the future. But of most importance is for planners and decision makers to determine how to sustain it as a vital transportation link for America. Options which could assist state DOTs in transporting future freight flows will be discussed and critiqued in this chapter. Capacity enhancement options, financing options, and the roles of government and intermodal transportation will be covered.

### ***4.1 Capacity Enhancement Options for Increased Mobility***

Several potential options and strategies for maintaining and/or transforming our Interstate system exist. Some of these include installing separate truck lanes, tolling, utilizing rail, and increasing capacity through infrastructure improvements. In addition to some strategies and initiatives that will be discussed, establishing a national highway freight transportation policy that would address all Interstate concerns while still ensuring the efficient, reliable, safe and secure movement of goods would be beneficial to all and support our nation's economic growth into the next half-century.

Although traffic congestion is inevitable, there are ways to slow the rate at which it intensifies. Several tactics could do that effectively, especially if used in concert, but nothing can eliminate peak-hour traffic congestion from large metropolitan regions in the

U.S. and around the world. In the most basic form, congestion can be reduced by either a.) increasing road capacity, or b.) decreasing demand. Commonly, four ways that regions deal with congestion challenges include charging peak-hour tolls, greatly expanding road capacities, greatly expanding public transportation capacities, or living with the congestion.<sup>50</sup> The first three can be expensive or politically unfeasible options, leaving many regions to simply settle for living with the congestion.

The problem our Interstate system is facing is too complex for one technology or service to be the solution. Relieving congestion and improving mobility on highways cannot be accomplished overnight. Preserving the existing Interstate system and improving its performance will be an important priority, but capacity expansion, intermodal connections, and new highways are necessary in order to accommodate population growth and an expanding economy

#### **4.1.1 HOV Lanes**

Some strategies, while not directly affecting freight trucking, can improve truck mobility and improve Interstate efficiency by decreasing the number of cars on the highway. High occupancy vehicle (HOV) lanes have improved mobility in many markets. Usually HOV lanes require more than two people per car and are designated during peak-hours of the day. But variations of this policy occur in different regions of the U.S. Three and sometimes four passengers can be required of a vehicle in order to qualify for the benefit. The idea of HOV lanes is to encourage motorists to carpool, which, theoretically, takes more automobiles off the road, thereby reducing traffic volumes and decreasing travel time. Trucks are usually not allowed to travel in HOV lanes, regardless of the number of passengers in the truck or the load being moved.

Since HOV lanes normally run along the inside, or median of a divided Interstate highway, they can be a relatively easy method of increasing capacity. In rural and suburban areas, where congestion is becoming a growing concern, the space and access along the medians is usually untouched and available to install the additional lanes. This is a very effective method of improving capacity, reducing congestion, and improving Interstate flow. However, in urban areas HOV lane addition is often not an option. Many times the median has already been utilized for expanded capacity. In these cases, converting existing lanes to HOV lanes is the only viable option, but not the optimal one, as it would reduce the road capacity.

HOV lanes can be very difficult to enforce. Unless the lanes are grade separated, any vehicle has access to the lane. Law enforcement officials struggle to enforce the high occupancy policy and often the HOV lanes are just as crowded and congested as other lanes. HOV lanes are also most appropriate during peak-hours with heavy traffic. Some argue that the lanes are not worth their cost. But though they can be difficult to enforce, HOV lanes are a sound, viable, and fairly cost-effective option for states to use in order to improve conditions on Interstates.

The use of reversible lanes is another strategy used to improve congestion. These separated lanes move traffic in a specific direction for part of the day and can be utilized in a reverse direction as well at a different time of the day. This method has proved successful in Norfolk, Virginia and the Washington, D.C. area. Like HOV lanes, land access in the middle of existing Interstates is usually necessary in order to construct the roadway for reversible lanes. Once constructed, the lanes are extremely beneficial for peak-hour travel and emergency situations.



### 4.1.2 Truck-Only Lanes

Truck-only-toll lanes or truck-only lanes have received much attention in recent years as a solution to increased trucking on the Interstate system. Throughout the country there are freight-intensive corridors that could benefit from truck-exclusive lanes. Truck-only lanes could also bring about improvements in safety and truck-shipping efficiency and make better use of the nation's extensive highway network.<sup>51</sup> While this option has yet to be proven over time, some states are pursuing this strategy as a means to relieve congestion and improve trucking efficiency and reliability.

Trucking companies have undeniable interest in the future of the Interstate system. Increasing volumes of both motorists and truckers on major highways have hampered freight movement by decreasing the reliability of arrival and increasing the travel time of the freight. Because of this, many state highway agencies are researching the provision of exclusive truck and bus lanes and freight corridors.

The Georgia DOT Office of Planning is currently conducting a study to explore the need for truck-only lanes on Interstate routes. In addition to providing additional capacity to facilitate traffic flow, the truck-only lanes reduce the potential for auto-truck crashes. The Savannah-Chatham County area of Georgia is receiving special attention because of the large volume of truck traffic generated by its ports.

New Jersey operates a section of their Turnpike as a truck-only concept. They have a 33-mile segment that consists of interior lanes for passenger cars only and exterior lanes for trucks, buses, and passenger cars. In a study conducted by the Commercial Bus and Truck Study, exclusive lanes for trucks and buses have been used or considered by only 20 percent of highway agencies.<sup>52</sup> Several states already have truck-exclusive lanes

that facilitate freight movement and several others, in addition to Georgia, are investigating it.

Creating truck-only lanes along the Interstate system could greatly benefit freight travel, especially along freight intensive corridors. In the coming years, more will be known about the benefits gained from using this method. The downfall of implementing truck-only lanes is the cost. Constructing additional lanes for extended lengths could become extremely expensive. State DOTs and policy makers will be reluctant to approve funding for options such as this as it will have no direct impact on everyday citizens.

State DOTs investigating this option should look to form alliances with private companies in order to offset costs of construction. Trucking and shipping companies are becoming more and more likely to assist in the funding of highway projects that will benefit their network. Public private partnerships should be considered when assessing this option as it is a very optimistic option for state DOTs.

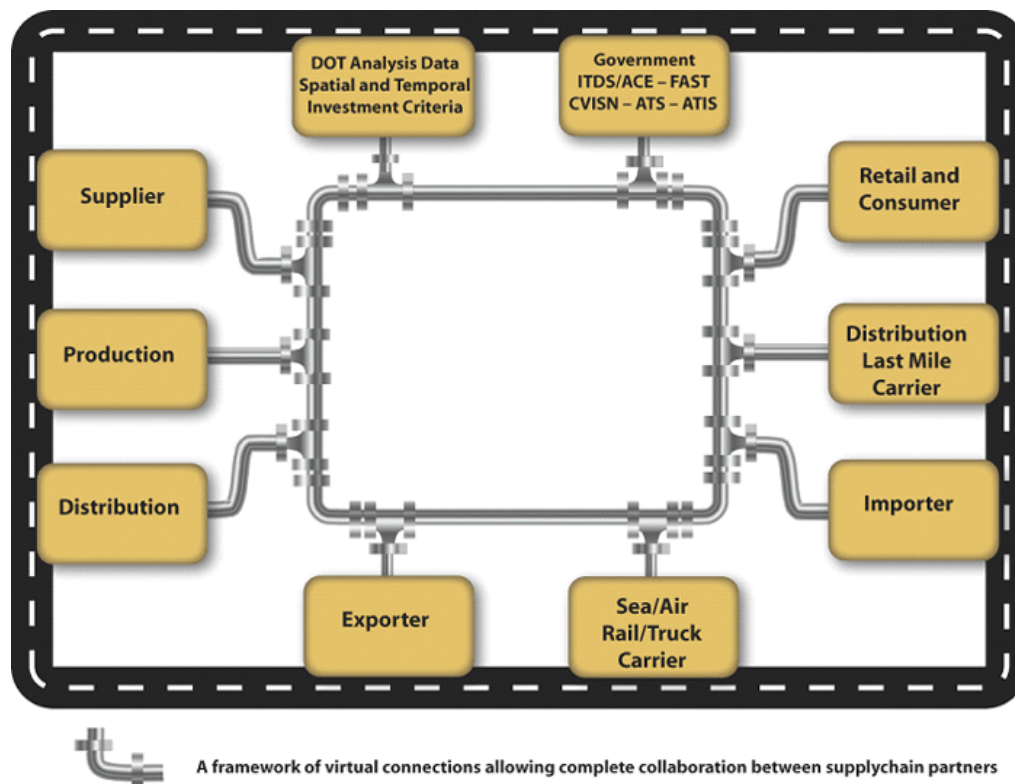
#### **4.1.3 Intelligent Transportation Systems**

Intelligent Transportation Systems (ITS) also hold promise for maintaining or improving freight transportation mobility on Interstates. The most basic device now being used on many urban Interstates is the use of large variable signs informing drivers of traffic conditions ahead. But many other technologies exist that could help speed traffic flows on the Interstates.

The U.S. DOT's ITS program is focused on solving multiple issues with programs that have the potential for improving safety, mobility, and productivity on the nation's roadways. The program identified nine major initiatives in 2004, one of which is Electronic Freight Management (EFM). The Electronic Freight Management Initiative is

assisting in making improvements to increasing freight volumes. The goal of the initiative is to bring improved operational efficiency, productivity, and security of the transportation system through the use of a common EFM and message portal that enables access to shipment information to all supply chain partners in real time.<sup>53</sup>

Another initiative the U.S. DOT ITS program is working on is the Freight Information Highway (FIH). The FIH provides an opportunity for all trading partners and government agencies to communicate and find shipment information without the expense of constructing a data repository. Working as a Web Portal, the FIH links information which presents opportunities for shippers, carriers, and government entities to leverage and coordinate data elements and components that support their operation applications and improve efficiencies. The system ultimately seeks to streamline freight operations and improve flow on the highways and railways of America. The diagram below illustrates the implementation of the FIH fully deployed.



**Figure 4.1.3: Freight Information Highway**

Technologies currently exist that can categorically help traffic flows on Interstates. E-ZPass and electronic screening of trucks are two ways of increasing the efficiency of trucks by reducing travel times. Both are commonly used in throughout the United States. But the main issue with ITS is the lack of consensus on which system will ultimately help the most. ITS can be expensive and difficult to install or implement. Often, the vehicles and the Interstate system must be aligned in order for the system to work. In addition, the technological advances being made today often cause a technology to be obsolete after only a few years. Few decision-makers are going to support systems that pose such a high risk.

#### 4.1.4 Rail Lines and Gateways

Railroads are increasingly becoming an effective alternative to freight trucking. As the Interstates continue to reach capacity and travel times become longer and more inconsistent, railroads could gain a greater market share. Shifting freight traffic to rail lines could improve freight transportation on the Interstates greatly by diverting much of the freight flow from the roads. Many states are forming partnerships and investing in short line railroads. For example, Georgia DOT works with CSX railroad on their current rail projects in order to lengthen siding throughout the state. This cooperative planning will facilitate CSX plans to run longer train segments and improve railway capacity in Georgia.

Several issues revolve around international gateways. Port cities and major international border crossings are becoming severely congested because of populations gravitating towards coastal and border regions. Because of this, public and private organizations will struggle to find adequate land available to make freight transportation improvements. Several gateway projects have begun and many more will begin in the future. The objectives of these projects are to improve the throughput at the facilities and mitigate congestion.

The model for a gateway project is the Alameda Corridor, which used funding sources from federal, state, and port programs in order to fund construction to alleviate congestion at the Ports of Los Angeles and Long Beach. The project brought together public and private organizations and multiple jurisdictions in order to address a problem of regional and national interest. The project was completed in 2002. The 20-mile long cargo expressway links the ports of Long Beach and Los Angeles to the rail network near

downtown Los Angeles. It consists of bridges, underpasses, and overpasses that facilitate an efficient transportation network. The project began because of the limited highway access to the ports. Moving freight away from the busy ports saves over 15,000 hours of vehicle delay each day. Trucks now can receive their cargo in a less congested area away from the ports, which saves both time and money.

A similar situation occurs in Virginia, where the Virginia Inland Port (VIP) operates as an intermodal container transfer facility. Containers coming to and from the United States via Hampton Roads are moved by train to and from the VIP. Located along Interstates-81 and 66 in Front Royal, Virginia, the facility saves trucks a 220-mile one way trip and significantly relieves congestion in the Hampton Roads area.

Projects such as these are excellent ways for cities, regions, and states to enhance freight transportation. A rail freight corridor project would potentially do nothing to the Interstate system directly, but could greatly enhance it by diverting trucks off of the system. The benefits are great, but the costs can be even greater. Much planning, effort, and money goes into gateway projects. They cannot be constructed over night, but they are of great benefit to both gateway cities and the Interstates.

#### **4.1.5 Adding Infrastructure**

The most basic solution to growing congestion is simply adding more base capacity to the Interstates or rail lines. Adding new lanes to Interstates, building new highways, or redesigning bottlenecks would assist freight transporters and allow them to continue providing high-quality service to both automobiles and trucks. Adding new lines to the railroads would allow for more areas to be served or greater throughput along congested rail corridors. Most states are planning to add capacity in some way, but

others are looking at corridors that can use both rail and Interstates to transport freight. Virginia is aggressively considering rail as a direct alternative to Interstate freight transit along the Interstate-81 corridor. New Jersey currently operates a state rail funding program that distributes \$10 million annually to short line railroads in an attempt to attract more freight movement to rail.

Both rail and Interstate infrastructure increases are long term projects that are expensive, but both will greatly enhance their respective systems. Infrastructure improvements to the Interstate system will continue to be the most common option used by state DOTs. More and more Interstates will become eight, ten, or twelve lane highways as the only constraints on this option are land access and money.

#### **4.1.6 Efficient Operations**

Another solution is to operate existing facilities more efficiently. Since accidents on the Interstates is a major cause of congestion and delay, one of the methods being used is quickly removing traffic-blocking accident and incidents from major roads. Roving service vehicles managed by traffic centers equipped with television and electronic surveillance of the Interstates is excellent in reducing congestion delays. Funding such a service could be an issue. However, accidents are the cause of approximately 25% of congestion and anyone involved in an accident is grateful for a quick response time by emergency services. Therefore, a well-run service along major Interstates in urban areas could be an improvement that would be easier to monetarily justify to tax-payers.

One cost-effective solution transportation planners are encouraging is utilizing travel and land use patterns that use the existing system in less congestion producing ways. Examples of this include extending freight facility hours, de-conflicting worker

hours, and limiting access into congested areas during certain times. All of these techniques serve to reduce congestion and promote better throughput on highways and freight lines.

Improving efficiency of operations on Interstates is mainly a management issue. Using creative ideas, working with people in the community to change behavioral tendencies, and developing programs that can reduce congestion on Interstates for minimal or no cost are methods that state DOTs and regional planners can utilize.

#### **4.1.7 Public Transportation**

While not a direct solution for freight transportation, public transit offers an indirect solution to Interstate congestion. Public transit systems offer an alternative to automobiles. Increasing ridership on these systems or providing service to new areas can reduce the number of automobiles on the Interstates. Transit systems can be very expensive however. In conjunction with public transit systems, clustering high-density housing around transit stops would permit more residents to commute by walking to transit, thereby decreasing the number of vehicles on the Interstates.

Another motive for the use of public transit is for government or employers to offer employees a stipend or allotment instead of free parking. This could reduce the number of automobiles on the Interstates, but does not prevent the consequences of triple convergence.

Public transit as a method of reducing congestion on Interstates, and thereby improving freight transportation, is not practical. However, state DOTs might mandate that public transit and high-density urban development be a focus in development and



transportation plans. This strategy could happen, but it is very complex and difficult for state DOTs to affect.

#### 4.1.8 Summary

The preceding sections discuss potential methods for improving capacity on Interstates. Other methods and ideas exist, but these options could increase mobility the most. The table below captures the advantages and disadvantages of each option discussed.

**Table 4.1.8: Capacity Enhancement Options**

Option	Advantages	Disadvantages	Likelihood of Implementation
HOV Lanes	Easy way to increase capacity during peak hours. Medians usually available for HOV lanes in rural and suburban areas.	Difficult to enforce. Only effective during peak hours. Urban areas might not have median space for HOV expansion.	High in rural and suburban areas.  Medium in urban areas
Truck-only Lanes	Directly affects freight trucking travel times. Separates cars and trucks.	Expensive. Potential political hold-up for funding as lanes do not affect everyday citizens.	Medium. More studies and a program that succeeds will spur more use of this option.
Intelligent Transportation Systems	Increase traffic flows on Interstates. Improves security. Multiple options for different scenarios.	Rapid changes in technology can quickly make systems obsolete. Expensive. Difficult to implement on a large network.	Low
Rail Lines and Gateways	Reduces trucks on Interstates. Proven Success in California. Creates redundancy and overlap in freight system.	Land access for expansion expensive or not available. Securing funds for construction can be difficult.	Medium. Must have support of regional planning organizations and government.
Adding Infrastructure	Proven solution. Funding usually available. Increases throughput of automobiles and trucks.	Expensive. Can be time consuming. Land access becoming more difficult.	High

Efficient Operations	Inexpensive. Easy way of maximizing use of existing infrastructure.	Limited ceiling on improvements. Often need cooperation from businesses.	High
Public Transportation	Removes commuters from automobiles, thus reducing vehicles on Interstates.	Expensive. Controversial. Requires high-density urban development.	Low

## ***4.2 Financing and Funding Sources***

### **4.2.1 Private Sector Funding**

Private sector funding is a relatively new technique that can benefit fiscally constrained states and the Interstate system. This strategy is evidenced in Indiana with its \$3.8 billion leasing of the Indiana Toll Road. The money is financing a ten-year program of highway improvement and funding the start of a 150-mile extension of Interstate-69. Though only leased by foreign-owned companies to date, American investment banks are planning to enter this market in the near future. Privately run highways could benefit the public interests as they will likely offer a higher standard of service, complete construction improvements on time, and potentially be able to control demand through toll variation without the fear of negative political backlash. Indiana Governor Mitch Daniels, in testimony before a congressional hearing, said, “We have found a way to close our infrastructure gap and invest in hard, permanent public assets without a penny of gas tax increase or a penny of debt.”

This strategy breaks the established practice of public-financed highway projects, but offers an alternative to spending tax dollars on expensive capital investments.

Reservations about private sector involvement stem from the implications that a transition from a fuel tax-based system to a mileage-based fee system might have on the Federal/State relationship. Toll revenues would flow directly to states and private operators rather than into the Highway Trust Fund, which would have a profound affect on its monetary level and ability to continue supporting projects.

While uncertainty remains about the long-term benefits of private sector funding, the near-term benefits should be great. The money would allow states to speed up timelines and begin much needed projects right away. The downfall is that states would lose the annual revenue that a toll road provides as all of the toll revenue coming in would be going to private corporations.

#### **4.2.2 Transportation Bills**

Future transportation bills similar to SAFETEA-LU are necessary to maintain the Interstate Highway System through the coming decades. But is it possible that the nation will continue to accommodate growing freight traffic volumes by continuing to make capital investments on infrastructure? Building new highways and expanding current Interstates can help alleviate congestion, reduce travel times, and increase capacity. However, this strategy will be very difficult to accomplish through public funding. Capacity increases in areas that are severely congested and bottlenecked will be necessary, but would be decided upon in an analytical, priority-ranked method.

In 2009, a new transportation bill will be on the agenda of a new Congress and a new President. National and State transportation planners will be lobbying politicians for the support that is necessary for the country's transportation needs. The current bill,

SAFETEA-LU provides billions of dollars for transportation improvements, but future bills will have to provide even more allocations to states.

### **4.2.3 Tolling and Variable Road Pricing**

A growing trend is the practice of tolling and variable road pricing as a means of contributing to existing highway revenue as well as financing new infrastructure. Tolling can also serve as a means of managing highway demand. Many current transportation experts feel that for the immediate and near-term future, tolls look like the most practical and logical way to supplement the eroding value of the gas tax.<sup>54</sup> Additionally, tolls offer the advantage of managing traffic demand by varying prices with fluctuating demand levels. This is exemplified today in Southern California where SR 91 toll lanes carry twice as many vehicles at speeds three times faster than an adjacent highway. The most recent express toll road opened along Interstate-25 in Denver in June 2006. This two-lane facility was converted from a former HOV corridor. Tolls fluctuate at different rates throughout the day in order to manage traffic volume and maintain free flow conditions.

Tolling has gained new momentum as a source of new funds for roads and as a means of managing highway capacity more efficiently. Legislation under TEA-21 and SAFETEA-LU provided incentives for states to experiment with tolls for construction finance and demand management, as well as using federal funds to construct or reconstruct toll roads. Because the federal fuel tax at its current level cannot adequately support the future highway investment needs, tolling provides a viable option for transportation officials

For the near-term future, tolling holds great promise for reducing the delays and harm caused by congestion. Tolls allow capacities to be self-adjusting and fees provide

funds for construction of new highways or expansion of existing ones. By changing toll prices with fluctuating demand levels, highways can maintain free-flow traffic conditions at virtually any hour of the day and offer the public an option to congested roadways. Charging peak-hour tolls is a form of tolling that could reduce vehicles on the Interstates. If tolls were set high enough and collected electronically, the number of vehicles on major Interstates could be reduced enough so that vehicles could move at high speeds.

Northern Virginia's Dulles Greenway is an example of how tolling might work in a heavily saturated market. The corridor offers two parallel routes leading from Dulles International Airport to Leesburg, Virginia. One route is a toll-free publicly run route and the other a tolled, privately financed and operated highway. Opening in 1995, the Greenway provided an alternative to Routes 7 and 28 by cutting a 30-minute trip to a 15-minute trip.<sup>55</sup> The system maximizes traffic flow by offering electronic tolling through VDOT's Smart Tag collection system. The Smart Tag system is five times faster than conventional cash payment lanes. Thousands of motorists and truckers choose to pay the tolls each day as opposed to spending time sitting in congested traffic. The Greenway is a leading example of how the public and private sectors can cooperate in order to solve transportation issues on highways.

Funding of toll facilities has also become easier in recent years. Federal aid funds are now available to states in order to construct roads or facilities.<sup>56</sup> Congress has relaxed restrictions on tolling Interstates and federal policy has become very supportive of tolling and road pricing. Future highway investment decisions will most likely involve tolling in some shape or form.

But tolling also has many political and institutional obstacles that are formidable.<sup>57</sup> Tolling potentially brings discrimination against the poor as they would have to forfeit a greater proportion of their income in order to travel on highways. Often, tolling lanes are referred to as “Lexus Lanes” as only the wealthy can afford to take the less congested toll lanes. Though the federal government has relaxed its stance on tolling, many officials still strongly oppose a system.

#### **4.2.4 Raising the Gasoline Tax**

Raising gas taxes could slow the rate of increase of all travel, not just peak-hour commuting. The federal motor fuel tax is 18.4 cents-per-gallon and the federal diesel fuel tax is 24.4 cents-per-gallon. The revenue collected from these taxes is the primary sources of funding for the federal Highway Trust Fund, which distributes funds to state and local governments for highway and bridge repairs as well as other transportation improvements.

Congress has refused to consider a gas tax because it is politically unpopular. Even though the United States has the cheapest fuel costs in the world, Americans do not want to see a raise in the gas tax. Raising the tax would bring billions of more dollars to the Highway Trust Fund, but Congress will most likely not raise the fuel tax anytime soon.

**Table 4.2: Analysis of Funding Methods**

Method	Positives	Negatives
Private Sector Funding	Fiscally constrained states benefit. Likely will offer a higher level of service. Potentially able to control demand through toll variation without fear of negative political backlash. Offers an alternative to spending tax dollars.	Reduction in the amount of funds going into the Highway Trust Fund – states lose the revenue that a toll road provides. Uncertainty of long-term benefits.
Transportation Bills	Proven method of funding transportation projects. States benefit from funding from the Federal Government.	Current funding is not meeting the monetary levels required to maintain the Interstate system.
Tolling and Variable Road Pricing	Contributes to existing highway revenue and allocations. Can serve as a means of managing highway demand. Practical and logical way to supplement the eroding value of the gas tax. Holds promise for reducing delays and harm caused by congestion. Has become easier to fund because of loosened regulations.	Discriminates against the poor as they would forfeit a greater proportion of their income in order to travel. Only the wealthy can afford.
Raising the Gasoline Tax	Could slow the rate of increase of all travel. Would bring billions of more dollars to the Highway Trust Fund.	Politically unpopular. Americans do not want to see a gas tax raise.

#### 4.2.5 Attitudes of Stakeholders

Interestingly, representatives from three major trucking organizations, FedEx Freight, Wal-Mart, and Schneider National stated that they supported increasing the fuel tax over higher tolls during a September, 2006 House of Representatives hearing.<sup>58</sup> The organizations expressed opposition to toll roads because of the difficulties their companies had adapting to an increasing number of tolled roads and the freight that was restricted on some roads. This statement is interesting in that it opposes what most would think trucking organizations would want. Unfortunately, a gas tax raise would be a national event that would receive much publicity. A toll raise predominantly goes unnoticed.

The future of the Interstate is dependant upon funding. Several transportation planners feel that tolling is the most practical and logical way to supplement the eroding value of the gas tax and shortfall of allocated funds from SAFETEA-LU. The Urban Mobility Corporation feels that by the end of this decade, “open-road” tolling will become near-universal.<sup>59</sup> Another potential future change to highway funding is an approach where private capital, rather than tax dollars become the chief source of financing capacity expansion. If private capital were used, the struggling Highway Trust Fund would only have to assume responsibility for the maintenance, reconstruction, and rehabilitation of the existing Interstate system, while the private corporations would fund new construction.

### ***4.3 Government Involvement and Support***

The Interstate system continues to serve the country by providing a fast and efficient way of moving people and goods throughout the United States. But new strategies at the national level are needed in order for the Interstate to continue providing this service. U.S. transportation policy has historically been governed primarily by concerns for passenger interests. Freight movement has largely been thought to be of interest to only the private sector. However, national, state, and local governments are beginning to realize the importance of efficient freight movement and are taking steps to understand and consider freight needs. Policymakers are beginning to recognize the importance of vehicle freight movement and authorize appropriate programs that will assist in streamlining freight trucking efforts. Support from the government is a necessary condition for implementation of new projects.



On a national level, policymakers have started taking notice. In July 2006, a bipartisan group of senators introduced the Freight Rail Infrastructure Capacity Expansion Act to stimulate investment in transportation infrastructure. The legislation would provide any organization, including railroads, trucking companies, and shipping lines, a 25% tax credit for their investments. But this is just one example of new legislation aimed at alleviating road congestion and improving freight movement.

State DOTs are beginning to realize the importance of having a Governor-backed transportation policy. In the University of Virginia survey that was conducted in this study, two of the ten responding states stated that they were working hard to get the Governor's attention for their long range freight plans. One state DOT even hoped to get a "Freight Czar" that would serve as an advisor/liaison to the state government and DOT. Freight transportation is a joint venture of government and the private sector. Therefore, the future of the Interstate system and the adequacy of freight capacity in the coming decades will be dependant upon government decisions on numerous spending, regulatory, and operational questions.<sup>60</sup>

As congestion continues to rise, constituents are going to look to their states to fix the problems. Therefore it is crucial for elected officials to understand the issues before them. It is the responsibility of state DOTs to assist in finding solutions. Traffic congestion is also increasingly becoming an important topic in political elections. Politicians, especially at the state level, are beginning to understand the value of good freight transportation networks. A reliable transportation network equates to economic prosperity, happy constituents, and satisfied businesses.

#### **4.4 Intermodal Transportation**

The growth of freight traffic on other modes of transportation will greatly affect the future of the Interstate system. Vastly more freight is being moved today by rail than would otherwise be traveling on Interstate Highways. Railroad companies, port facilities, and inland freight waterway companies are all working with public and private officials in order to help solve freight issues.

One example of a transportation company seizing the opportunity is Norfolk Southern Railroad. The fastest growing sector of Norfolk Southern Railroad is its intermodal division. Since the first quarter of 2003, Norfolk Southern's intermodal revenues are up 23%.<sup>61</sup> CEO Charles Moorman recently said there are four main reasons for this:

1. Rising oil prices – competitive advantage for rail
2. Chronic shortage of long-distance truck drivers – some major trucking companies must recruit 14,000 drivers/year
3. Huge increases in imported goods – stores such as Wal-Mart, Target, Lowe's, etc. are importing enormous volumes of goods from overseas, which helps railroads
4. Highway congestion – very expensive to address

A system that would utilize ships and rail to get freight as close as possible to its destination would greatly decrease the volume level of trucks on the Interstates. An intermodal approach to delivering freight is closer than ever before, but much infrastructure development is needed. Mr. Moorman stated that along the Interstate-81 corridor, 100,000-200,000 trucks per year could be diverted to rail with modest

infrastructure improvements to existing rail lines. He also noted that a million trucks could potentially be taken off of the Interstate if a \$1 billion investment in tracks, terminals, and rolling stock were made.

Most worrisome to transportation planners is the concern that the infrastructure required to accommodate future growth will lack the funding necessary to make improvements. Tough decisions have to be made if the current level of funding remains the same. If new programs or infrastructure is to be built, other programs must be cut or alternative forms of funding must be found. The intermodal infrastructure that was used over the past few decades is reaching capacity. This includes highways near intermodal sites, rail links, and port facilities. Funding for new intermodal infrastructure will be difficult to find. Concern exists over how intermodal facilities will accommodate the growth in international markets without significant infrastructure improvement.

The growth of intermodal freight traffic will aggravate the problem of high-concentrations of truck traffic near terminals. The most important constraint on intermodal growth is land access, especially in water ports. Practically all U.S. port facilities are situated in heavily populated cities that have limited capability for expansion. Interstates that once connected the port facilities are now severely congested with automobile traffic utilizing it for intra-city travel. For example, about 90% of the freight moved through the Port of New York/New Jersey is carried by truck. A shift to increased intermodal freight transportation could dramatically shift thousands of trucks off of the Interstates, but it faces infrastructure challenges that will be difficult to overcome in order to make it competitive with freight trucking on the Interstates.

## **4.5 Summary**

Many options exist for transporting freight on the Interstate system, but deciding upon a specific strategy is difficult. The ultimate goal for freight transportation planners is finding a way to maintain and/or transform the current Interstate system. Several options have been looked at in this chapter, but many others exist. Each state has different needs and different challenges with regard to their Interstate system and freight trucking.

The addition of infrastructure, HOV lanes, and use of more efficient operations are all promising options for state DOTs to use. But it is also vital for states to ensure the proper government support is in place and that other options are studied prior to deciding what action to pursue. The next chapter will discuss the findings and conclusions of this study.

## Chapter 5: Findings, Conclusions, and Recommendations

“Congestion is not a fact of life. We need a new approach and we need it now.”

- Former Secretary of Transportation Norman Mineta  
May 2006

### ***5.1 Findings***

In signing the Federal-Aid Highway Act in 1956, President Eisenhower created a system that pushed the United States into being the dominant economic power in the world. But economic prosperity has produced record demand for personal and freight mobility. Continued economic growth is threatened by congestion and the costs which shippers, manufacturers, operators, and ultimately, consumers, bear.

The decision to move forward with the Interstate system 50 years ago leaves us with a grand, albeit costly to maintain, transportation system. We have a 46,837 mile network made of concrete, asphalt, and steel that will be with us for a long time. Ensuring it continues to serve the country for the next 50 years and continues to bring economic prosperity to Americans is the responsibility of all levels of government, state DOTs, transportation planners, private industries, and citizens. All must be prepared to embrace new solutions and policy changes in order to move forward into the next half-century.

Congestion on the Interstates is not going away. Peak-hour congestion in almost every large metropolitan region has, and will remain, a part of every commute. In fact, congestion is a sign of economic prosperity and success – not a mark of social failure. What is important is for congestion to be controlled to the point where economic

development is not hindered. Freight movement on the Interstates must be maintained by adopting policies and programs that allow it to provide safe and efficient movement of goods throughout the country.

## **5.2 Conclusions**

After gathering feedback from states and conducting this study, the following are the important conclusions:

- Passenger transportation projects have priority over freight transportation projects.
- In general, there is a lack of planning between government officials, state DOTs, and the private sector.
- Involving public and private sector officials when developing transportation plans benefits both parties and produces better outcomes.
- There is an increased private-sector interest in U.S. transportation systems. More and more states will form agreements with private agencies.
- State DOTs pursue many different projects, use many different methods, and have different attitudes towards the Interstate system.
- States are very concerned about congestion on the Interstate system.
- There is not much apparent support for new intelligent transportation systems as methods of solving freight transportation issues. However, existing toll plaza E-ZPass and automatic weigh station systems do assist freight trucking.

- U.S. State DOTs are at many different stages in developing freight transportation plans. Coastal states see freight transportation and congestion as a great concern. Inland states have rarely addressed the situation.

### **5.3 Recommendations**

The future of our Interstate system is solid. The system that has served the country for the past 50 years will continue to move people and freight well into the future. But transportation planners must begin planning for solving traffic congestion problems and focusing on freight transportation. Maintaining a system that allows free movement of freight and passengers will require creative approaches. A balanced approach that would include smart future planning, innovative techniques, capacity increases, or modal shifts could significantly extend the life of the Interstates. Congestion is not an insurmountable problem. But solutions will require a smarter approach to capacity expansion and improved productivity of existing transportation assets.

The main objective of this research effort was to identify feasible options that state DOTs could use for freight planning on the Interstates. The following four recommendations will benefit state DOTs and planners.

1. **Pursue private sector investment opportunities.** The U.S. DOT will be reducing or removing barriers in the near future that will allow even more private sector investment in the construction, ownership, and operation of transportation infrastructure. Leasing existing facilities for cash up-front allows a state to complete critical transportation projects that otherwise would have been years away from beginning.

2. **Form regional planning commissions of public and private partners.** A joint planning commission consisting of leaders from both the public and private sectors allows strategic freight planning on a regional level. Freight transportation is a national and regional issue that needs goals, priorities, and leveraging capabilities. Freight policy must break through traditional local jurisdiction practices and form a system wide transportation plan that will benefit all in the region. State DOTs must facilitate such partnerships.

3. **Implement tolling practices in congested areas.** In areas where congestion dominates the Interstates, states should identify and implement tolling practices that would reduce the number of trucks and automobiles. Forming tolled HOV or truckway lanes, charging peak-hour tolls, or fluctuating tolls based on demand will all work to maintain traffic flows and allow more people to travel per-lane per-hour than under heavily congested conditions.

4. **Increase capacity of Interstates near port and rail facilities – Improve port and rail infrastructure.** Severe congestion regularly occurs on routes and entrances to port facilities. Old and inadequate infrastructure exists at both the port and rail facilities as well as on the Interstates leading to these facilities. Though very expensive and difficult, capacity expansion must occur as the economy continues to grow. The Interstate must be capable of providing a reliable route to and from port and rail facilities.

In this study, it was discovered that there was no official document or study that definitively made recommendations on the future of freight transportation and the Interstate system. Multiple transportation “experts” authored pieces which speculated on it, but all were of personal speculation. Therefore, in addition to the above



recommendations, an Interstate study group should be formed in order to conduct a major policy study on the future of the Interstate system. Led and conducted by the National Research Council, the policy study should be released by 2009 – prior to the next transportation bill authorization. A comprehensive study would greatly benefit decision-makers and transportation officials as our nation heads into the future.

This research project exposed/discovered several issues that require further study. The following are areas where further research is currently needed with respect to freight transportation on the Interstates:

- Freight Data Collection – resources should be devoted to a comprehensive data collection program to determine freight flow patterns on Interstates throughout the U.S. Better data would allow planners to develop appropriate freight modeling tools. Currently, planners struggle to predict freight flows because of a lack of data.
- Success of projects – no data exists that “rates” the success of initiatives that have been completed. The assessment of completed projects needs to be examined in order to determine plans for the future.
- Shift of freight from highway to rail – research is recommended on comparing the costs and time associated with rail transport versus Interstate transport.

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## Glossary

AASHTO	American Association of State Highway and Transportation Officials
CANAMEX	Canada and Mexico
DOT	Department of Transportation
EDR	Event Data Recorder
EFM	Electronic Freight Management
FAF	Freight Analysis Framework
FAST	Freight Action Strategy
FedEx	Federal Express
FHWA	Federal Highway Administration
FIH	Freight Information Highway
HOV	High Occupancy Vehicle
HOT	High Occupancy Toll
ISTEA	Intermodal Surface Transportation Act of 1991
ITS	Intelligent Transportation Systems
JIT	Just-in-Time
MPO	Metropolitan Planning Organization
NAFTA	North American Free Trade Agreement
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SIS	Strategic Intermodal System
TEA-21	Transportation Equity Act for the 21 <sup>st</sup> Century
TRB	Transportation Research Board
UPS	United Parcel Service
USPS	United States Postal Service
U.S. DOT	United States Department of Transportation
VIP	Virginia Inland Port
VMT	Vehicle Miles Traveled

## Appendix A

### Questionnaire

1. What is your state doing about freight movements on the Interstate Highways? Is there an issue with increasing freight traffic in the state?
  
2. What investments is your state putting into planning for increased trucking on the Interstates? What areas are you looking at for congestion relief?
  
3. What do you believe the future of the Interstate Highway System is? What is your vision of what it will look like in the future?
  
4. What is the role of rail in regards freight movement on the Interstates? What specific actions are being performed with rail in your state? Do your plans include the diversion of trucks on the Interstate Highways?
  
5. Rank the following areas in order of the level of attention they receive in your state. (1 = most attention)
 

Congestion	_____
Safety	_____
Environment	_____
Freight Movement	_____
ITS	_____
Research and Development	_____
  
6. Indicate how important planning for freight transportation is on the Interstate Highways in your state.
 

1	2	3	4	5
Not at all	Slightly Important	Moderately Important	Very Important	Extremely Important
  
7. Indicate the level of concern for congestion on your state's Interstate Highways.
 

1	2	3	4	5
Not at all Concerned	Slightly Concerned	Moderately Concerned	Very Concerned	Extremely Concerned

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