Transportation Vision for 2030

Ensuring personal freedom and economic vitality
for a Nation on the move

U.S. Department of Transportation
Research and Innovative Technology Administration

January 2008

Safety
System Performance
21st Century Solutions

"Since our Nation's founding, transportation has transformed our country … If we want to keep our economy strong and maintain our high quality of life, we must keep our transportation systems vital and viable … First and foremost, we must make travel safer … That means we must build safety considerations into every transportation decision. Second, we must boost the entire network's performance by improving predictability and reliability. And, finally, we must find 21st century solutions to 21st century mobility challenges."

Mary E. Peters
U.S. Transportation Secretary

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Message from the U.S. Secretary of Transportation

Mary E. Peters
U.S. Secretary of Transportation

Transportation lies at the core of the freedom we enjoy as Americans — freedom to go where we want, when we want — freedom to live and work where we choose, and freedom to spend time with our families.

Transportation Vision for 2030 represents our transportation system the way it can be — if, and only if, we all work together. Since our Nation's founding, transportation has transformed our country. If we want to keep our economy strong and maintain our high quality of life, we must keep our transportation system vital and viable. First and foremost, we must make travel safer. Second, we must boost the entire network's performance by improving predictability and reliability. And, finally, we must find 21st-century solutions to 21st-century mobility challenges.

Today, our vital transportation infrastructure is showing signs of aging. We are experiencing unprecedented congestion on our Nation's highways and railways and at our airports and seaports. It is robbing our Nation of productivity and our citizens of one of their most valuable resources — time.

U.S. DOT is committed to working with our public and private sector partners to address these issues and to provide our Nation with a transportation system that is unparalleled in its safety, security, efficiency, and effectiveness.

I look forward to working with you to deliver a transportation system that frees all of us to make daily decisions, confident that people and goods will reach their destinations safely without worrying about how they will get there or if they can make it on time.

Message from the Administrator, Research and Innovative Technology Administration

Paul R. Brubaker
Administrator, Research and Innovative Technology Administration (RITA)

The constant and efficient movement of people and goods across the U.S., and around the globe, is crucial to sustaining our global economic leadership and ensuring the quality of life for all Americans.

Our Nation's growing population and changing demographics coupled with the demands of a growing global economy are placing unprecedented stress on our transportation system. Overcoming these challenges will increasingly rely on the development and deployment of new technologies and cutting-edge solutions.

U.S. DOT is committed to achieving America's vision of a world-class national transportation system. But to do so, we must innovate. An innovative transportation system will apply effective, integrated, sustainable, intermodal, and cost-effective transportation solutions to our Nation's most complex challenges. Only through the introduction of new concepts and new technologies will we see dramatic improvements in the safety, security, resilience, independence, sustainability, and reliability of our transportation system.

Transportation Vision for 2030 will help guide investment decisions and research. These investments will stimulate innovation and enhance U.S. competitiveness. By maximizing the investment of our transportation research, development, and technology dollars, we can vastly accelerate America's ability to realize its vision of the future transportation system.

"Our current transportation model is broken. We need fresh approaches like new technology, congestion pricing, and greater private-sector investment to get America moving again."

Mary E. Peters
U.S. Transportation Secretary

Transportation Vision for 2030

The transportation system in 2030 will be:

Safe, Less Congested
Free all of us to make daily decisions, confident that people and goods will reach their destinations safely and on time.

Economically Competitive
Strengthen America's leadership role in the global economy and spur economic growth and job creation.

Energy Independent
Guarantee our energy independence by reducing our Nation's dependence on foreign oil.

Environmentally Sustainable
Ensure environmentally sustainable communities and curb greenhouse gas emissions.

Secure
Provide security for national and international passenger, freight, and hazardous materials movement.

Resilient
Prepare for, and respond and be resilient to, manmade and natural disruptions.


To
Diamond
Lake Rd

Passenger Transportation

The Vision

The safety, security, efficiency, and reliability of our Nation's passenger transportation system and infrastructure will be world-class. We will waste less time and fuel while stalled in traffic jams, and less time and money will be wasted as a result of airline delays. There will be less transportation-generated pollution and noise in our communities. We will have increasing access to high-quality, public transportation during peak travel periods. Our vehicles will accommodate alternative fuels and new energy-saving technologies. America, as a result, will be significantly less dependent on foreign oil. Our transportation system will minimize greenhouse gas emissions and be prepared for the impacts of climate change. Technological innovation will improve the way that people and goods move around the country and the world.

Trends in Passenger Movement

Growing, Changing U.S. Population

- The Nation's population is growing rapidly, from 280 million people in 2000 to a projected 364 million in 2030. At the same time, the U.S. population is aging. By 2030, the population of those over 65 years of age is expected to double to 70 million. In order to go about their daily lives, the aging population may increasingly look to efficient alternatives to motor vehicle transportation.

- In step with the growing population and economy, highway vehicle miles traveled (VMT) are projected to grow 60%, from 2,952 billion miles traveled in 2005 to 4,733 billion miles traveled in 2030.

- The Nation's population will not be evenly distributed and many Americans will live in the South and West, where population is projected to grow by more than 40%. The burden on the transportation system in these areas will be extraordinary.

Safety

- Fatalities recorded in all transportation modes totaled 45,026 in 2006 compared with 45,735 in 2005. Highway fatalities account for about 95% of transportation fatalities each year. Improving safety throughout the transportation network is the premier objective of U.S. DOT.

- In 2006, there were 6 million traffic crashes in the U.S., injuring just under 2.6 million people, and the number of highway fatalities reached its lowest level, 42,642, in five years.

- In 2006, a traffic crash occurred every 5 seconds, someone sustained a traffic-related injury every 12 seconds, and someone died in a traffic crash every 12 minutes. Today, alcohol-related motor vehicle crashes represent 39% of all traffic-related deaths.

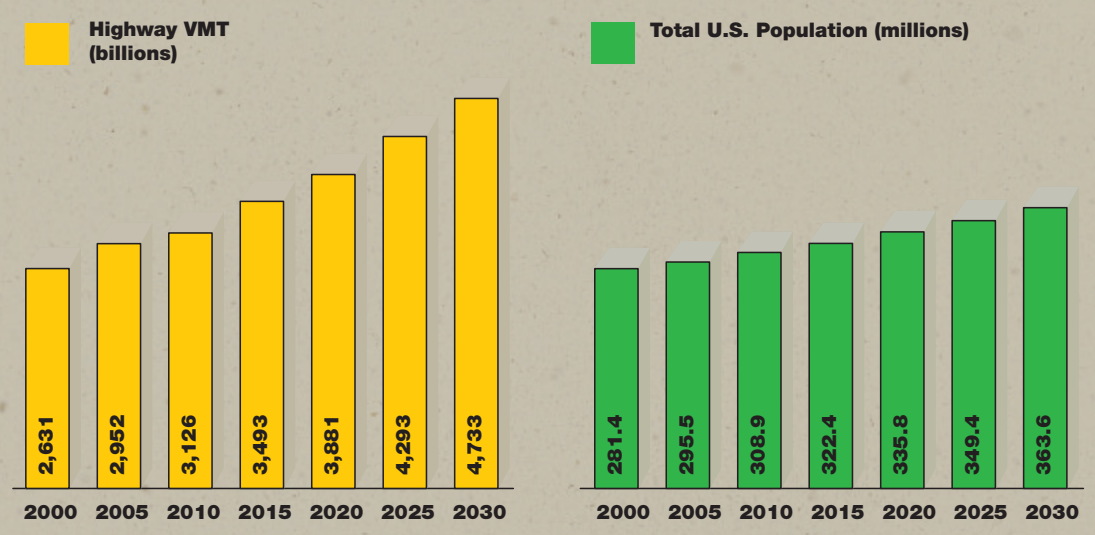
- A key indicator of the Nation's highway safety is the number of highway fatalities per 100 million VMT. This rate has been decreasing and is currently at 1.42 fatalities per 100 million VMT. Faced with increasing VMT and a growing population, we must work to decrease the highway fatality rate to 1.0 or less per 100 million VMT.

U.S. Population and Highway Vehicle Miles Traveled (VMT) 2000–2030

Highway VMT are projected to grow 60% by 2030, in step with the growing U.S. population.

Sources: U.S. Department of Energy/Energy Information Administration

U.S. Census Bureau



Congestion

- In 2005, the Nation's urban congestion problem resulted in 4.2 billion hours of travel delay, 2.9 billion gallons of wasted fuel, and a net urban congestion cost of nearly $80 billion, according to a 2007 Texas Transportation Institute report.

- To reduce congestion, efforts are underway to increase transit ridership by 2% or more each year. Transit passenger miles traveled (PMT) increased by 15.8%, from 40.2 billion in 1997 to 46.5 billion in 2004. In 2004, 41% of PMT was on motorbus, 31% was on heavy rail, 21% was on commuter rail, and 3% was on light rail.

- The airline industry's on-time performance in the first seven months of 2007 was the worst on record, and nationally almost 30% of all flights are now cancelled or substantially delayed. Travelers are being stranded at the airport, on the plane, and on the tarmac. A third of U.S. air traffic passes through New York airspace, and two-thirds of the Nation's air traffic can be affected when the New York area experiences delays.

- Aircraft travel is projected to nearly double, and current forecasts estimate over 1.5 billion air passengers annually by 2030. This will place unparalleled demand on the air system.

- Record-level gridlock at airports, seaports, and on our Nation's highways costs Americans an estimated $200 billion a year. Few Americans are being spared the inconvenience, and all of us are shouldering the costs.

Energy Independence and Sustainability

- Highway vehicle travel accounts for 81% of total U.S. transportation energy consumption, followed by air travel at 9%, water transportation at 5%, pipeline at 3%, and rail at 2%.

- U.S. consumption of liquid fuels — including fuels from petroleum-based sources and increasingly those derived from non-petroleum primary fuels such as coal, biomass, and natural gas, is projected to total 26.9 million barrels per day in 2030. Most of the increase is in the transportation sector and is projected to account for 73% of total liquid fuel consumption by 2030.

- Without extraordinary efforts to ensure our Nation's energy independence, America will be in the highly vulnerable position of importing nearly 70% of our petroleum by 2030.

- In the face of growing concern about global warming, reduction of carbon dioxide emissions in all sectors of the economy, especially transportation, is one of the major challenges for the U.S. In 2005, about one-third of the emissions originated in the transportation sector. In 2030, U.S. production of carbon dioxide emissions is projected to increase by nearly 35% over current levels.

Security

- On an average day, more than 1.1 million passengers and pedestrians, including over 630,000 aliens, over 235,000 air passengers, and over 330,000 privately owned vehicles, are processed at our borders, presenting a potential risk to National security.

- Since 9/11, the Federal government has deployed sufficient technology to electronically screen 100% of airline passengers and checked baggage. Investment in purchasing new and maintaining existing baggage screening devices is expected to increase baggage throughput by up to 250%.

Infrastructure

The large increase in system preservation investment since 1997 has had a positive effect on the overall physical condition of the Nation's highway and bridge infrastructure. The percentage of VMT on pavements with "good" ride quality rose from 39.4% in 1997 to 44.2% in 2004. The physical conditions of National Highway System (NHS) routes, which carry nearly 45% of total travel in the U.S., are better on average than the conditions of other roads.

Pathway to the Future

Achieve "Twenty in Ten": President Bush announced the "Twenty in Ten: Strengthening Energy Security and Protecting the Environment" initiative in May 2007. The goal of the effort is to reduce projected gasoline usage by 20% in the next 10 years — 15% through the use of alternative fuels and 5% by increasing the fuel economy of cars and light trucks.

Strengthen Highway Safety Programs: U.S. DOT will expand efforts to reduce highway fatalities and injuries through behavioral safety programs, vehicle safety programs, continuance of the National Driver Register program to provide a credible source of vehicle driver records, and highway safety grant programs. Emphasis areas will include efforts to reduce the number of alcohol-related fatalities and injuries and to strengthen occupant protection.

Introduce Safety-Oriented Technology Programs: Many new safety-oriented technology programs are underway and nearing deployment, including the Intelligent Transportation System (ITS) Vehicle-Infrastructure Integration (VII) program directed at collision avoidance between vehicles and between the vehicle and the infrastructure.

Reduce Congestion: To counter congestion, the U.S. DOT announced a major initiative in May 2006, "The National Strategy to Reduce Congestion on America's Transportation Networks." The "Congestion Initiative" brings together Federal, state, and local officials and stakeholders to deploy and demonstrate the effectiveness of tolling, other methods of congestion pricing, expanded transit service, strengthened telecommuting programs, and technological and operational approaches in the fight against gridlock.

Address Air Traffic Congestion That Clogs Our Busiest Airports and Airspace: U.S. DOT has started a process to help the busiest airports adopt new policies to efficiently address chronic airline overscheduling, which leads to long lines and delays on the tarmac.

Improve Air Passenger Complaint and Response Systems: The best way to protect consumers is to solve the underlying congestion and delay problems. As these problems are addressed, U.S. DOT is working on a number of initiatives to provide consumers with more information and protection.

Deploy NextGen: Over the next 20 years the Next Generation Air Traffic System (NextGen) is being deployed as one means to reduce air traffic delays. The new system involves major technology upgrades and replaces World War II-era ground-based radar technology with satellite operations.

Increase Role of Transit: By providing stable, predictable funds to urbanized areas, increasing funding for underserved rural communities, funding improvements to existing facilities and new multi-year construction projects, and improving transportation services to the elderly, the low-income population, and persons with disabilities, U.S. DOT is working to ensure that transit increasingly plays a vital role in the U.S. In addition, the Department of Homeland Security (DHS) is working in key high-threat urban areas to enhance security measures for critical transit infrastructure, including bus, rail and ferry systems.

Target Infrastructure Investment: Highway infrastructure quality numbers can be improved with more targeted investment strategies. There is a need to reconsider the infrastructure investment model and system performance criteria; spending options must be analyzed and existing systems must be managed more efficiently.

Transform Border Management and Immigration Systems: The US-VISIT program is the centerpiece of the U.S. government's efforts to transform our Nation's border management and immigration systems through the innovative use of biometrically enhanced security measures and other technologies.

Realizing the Vision: Spotlight on Progress

"For too long our Nation has been dependent on foreign oil. And this dependence leaves us more vulnerable to hostile regimes, and to terrorists — who could cause huge disruptions of oil shipments, and raise the price of oil, and do great harm to our economy."

President George W. Bush

20 in 10: Strengthening Energy Security and Protecting the Environment

"Successfully increasing the use of alternative fuels hinges on our transportation system. We need to ready the network for the biofuels economy, and this transition poses some complex delivery and distribution challenges."

Thomas J. Barrett
U.S. Deputy Secretary of Transportation

President Bush has asked us to join him in pursuing the goal of reducing U.S. gasoline usage by 20% in the next 10 years — Twenty in Ten.

America will reach Twenty in Ten goals by:

– Increasing the supply of renewable and alternative fuels by setting a mandatory fuels standard to require 35 billion gallons of renewable and alternative fuels in 2017 — nearly five times the target now in law. This will displace 15% of projected annual gasoline use. A new Alternative Fuel Standard will include domestic sources such as hydrogen, ethanol, biodiesel, and other alternative fuels.

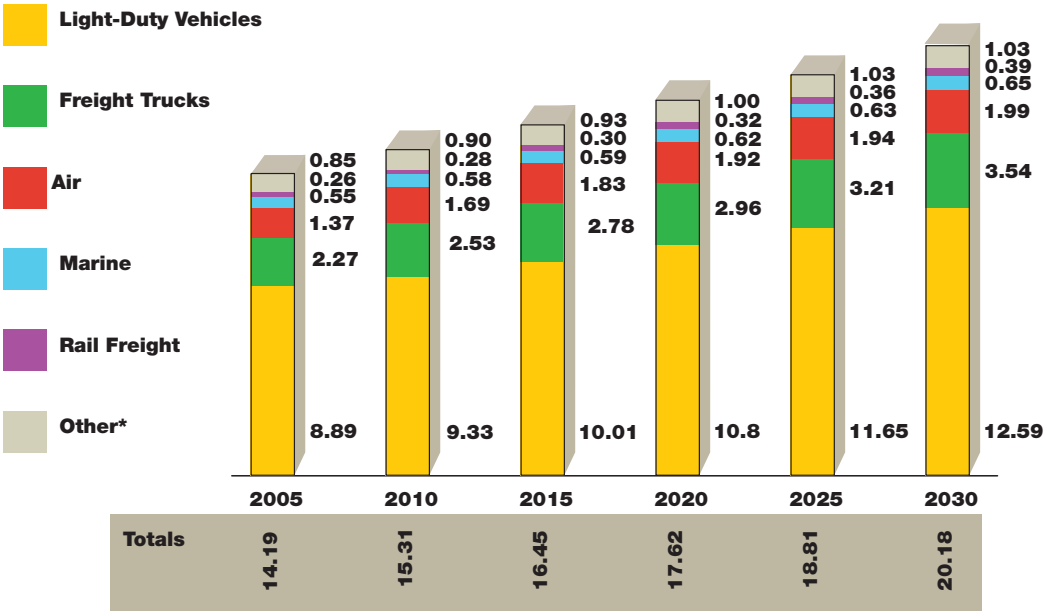
– Reforming and modernizing Corporate Average Fuel Economy (CAFE) standards for cars and extending the current light-truck rule. In 2017, this will reduce projected annual gasoline use by up to 8.5 billion gallons, a further 5% reduction that, in combination with increasing the supply of renewable and alternative fuels, will bring the total reduction in projected annual gasoline use to 20%.

– Confronting climate change by stopping the projected growth of carbon dioxide emissions from cars, light trucks, and SUVs by 2017. At that time, the renewable fuel and fuel efficiency components of the plan would cut annual emissions from cars and light trucks by as much as 10% — equal to zeroing out the annual emissions of 26 million automobiles. The plan could cumulatively prevent the buildup of more than 600 million metric tons of carbon dioxide emissions. The plan also includes:

– U.S. DOT working with States and cities to save fuel, reduce commute times, and explore ways to reduce traffic congestion.

– Stepping up domestic oil production in environmentally sensitive ways, and doubling the current capacity of the Strategic Petroleum Reserve (SPR) to 1.5 billion barrels by 2027.

Energy use by Transportation Mode
(Million Barrels per Day Oil Equivalent)
Source: U.S. Department of Energy/ Energy Information Administration



* *"Other" includes bus transportation, rail/passenger, military use, lubricants, and pipeline fuel.*

Urban Partnership Agreements: Working Together to Fight Gridlock

Urban Partnership Agreements (UPA) are a major component of the National Strategy to Reduce Congestion. Through UPAs, U.S. DOT is partnering with metropolitan areas to demonstrate strategies with proven effectiveness in reducing traffic congestion. Four strategies, collectively referred to as the "Four Ts," will be pursued. Each has a track record of effectiveness in reducing congestion:

Tolling: Implementing a broad congestion pricing or variable toll demonstration.

Transit: Creating or expanding express bus services or bus rapid transit, which will benefit from the free-flow traffic conditions generated by congestion pricing or variable tolling.

Telecommuting: Securing agreements from major area employers to establish or expand telecommuting and flex-scheduling programs.

Technology and operations: Utilizing cutting-edge technological and operational approaches to improve system performance.

U.S. Secretary of Transportation Mary E. Peters announced the first winners to receive lump-sum funding amounts to implement their traffic fighting plans: Miami, the Minneapolis area, New York City, San Francisco, and the Seattle area. Every Urban Partner proposed some form of congestion pricing.

Additionally, improved and expanded bus and ferry service will make it easier for commuters in these communities to leave their cars at home.

The plans also take advantage of new technologies to keep traffic moving and flexible work schedules and telecommuting to ease traditional rush hours.

NextGen: The Answer to the U.S. Air System Capacity Problem

"At the core of NextGen are infrastructure and operational capabilities to optimize air traffic management — which, in turn, reduce congestion and delays in the system, save travel time for the public, and improve energy conservation and emissions."

Mary E. Peters
U.S. Secretary of Transportation

The aviation industry is critical to the economic growth and trade of the U.S., contributing approximately $640 billion to our economy and generating 9 million jobs equating to $134 billion in wages.

Today, the U.S. air traffic system is in trouble; delays are growing at many of the major airports. The current air traffic system cannot keep up with the projected demand.

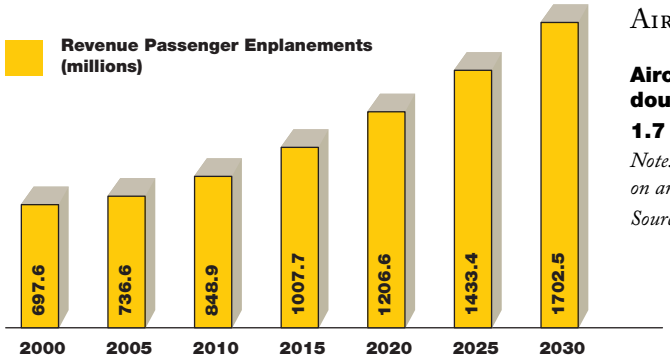
Based on plans for updated procedures and new equipment, NextGen is envisioned as the answer to the Nation's air system capacity problem.

Through NextGen, ground-based radar technology will be replaced by satellite-based operations. For the first time, pilots and controllers will have a common operational picture of the aircraft in U.S. airspace.

The new system together with other new technologies will allow aircraft to safely use airspace in much closer proximity and with less weather disruption.

Preliminary analyses indicate that NextGen capacity increases could yield economic growth as much as $175 billion through 2025.

By 2025, all aircraft and airports in U.S. airspace will be connected to the NextGen network and our air system will be better able to absorb the predicted increase in air transportation.

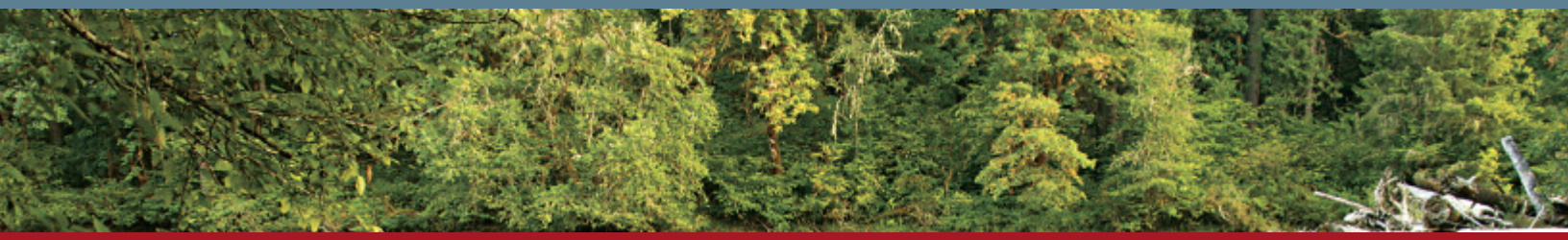


Air Passenger Demand 2000–2030

Aircraft travel is projected to more than double. Current forecasts estimate 1.7 billion passengers by 2030.

Note: Forecasts of scheduled passenger traffic from 2020 to 2030 are based on an assumed annual growth rate of 3.5%, currently used by FAA.

Source: U.S. DOT/Federal Aviation Administration

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Freight Transportation

The Vision

The U.S. freight transportation system will ensure the safe, secure, efficient, and reliable movement of goods and bolster the Nation's economy while improving environmental quality. Hazardous materials will safely, securely, and efficiently move through the air and on the railroads, seas, waterways, and highways. They will reach their destination on schedule, in time to fuel our automobiles and to heat and cool our homes and offices.

Trends in Freight Transportation

Increasing Demand for Freight Transportation

- Demand for freight transportation in America is increasing in line with our growing population and increased economic activity. As a result, the U.S. is experiencing increased congestion at our borders, our seaports, and on our major surface transportation corridors. During the course of one year, over 19 billion tons of freight, valued at over $13 trillion, was carried over 4.4 trillion ton miles in the U.S.

- The U.S. transportation system currently moves over 50 million tons of freight worth $36 billion dollars each day on the Nation's transportation network.

- By 2035, tons transported overall are expected to double to over 100 million, placing incomparable pressure on our domestic transportation network.

International Trade

- As a result of unprecedented economic globalization, international trade has grown faster than the overall economy, quadrupling in real value between 1980 and 2004. Approximately 1.7 billion tons of merchandise is estimated to be moving in and out of the U.S. each year, totaling about $1.5 trillion in imported goods and services and $800 billion in exports.

- U.S. imports and exports are handled in 40 states at over 400 seaports, airports, and land border crossings. At least 125 of these gateways handle 1 billion dollars of trade or more. The five top freight gateways in 2004 were John F. Kennedy International Airport, the border crossing of Detroit, and the ports of Los Angeles, Long Beach, and New York/New Jersey.

- Since 1990, the value of freight shipments among the U.S., Canada, and Mexico has risen by 170%, growing an average of 8% annually. More than 17 million truckloads of freight crossed U.S. borders with Canada and Mexico in 2005.

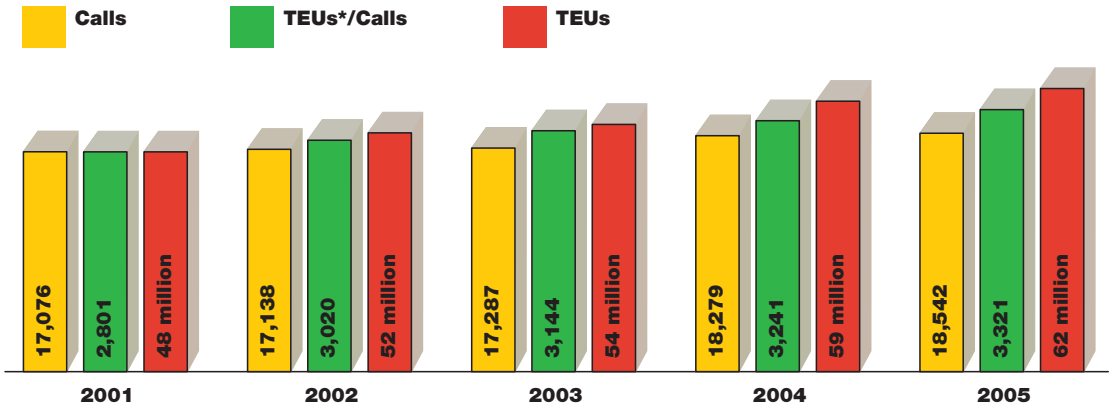
- More than 2 billion tons of cargo have moved through the St. Lawrence Seaway to and from Canada, the U.S., and nearly 50 other nations in the past 40 years. Almost 50% of Seaway traffic travels to and from overseas ports.

- Today, new economies are emerging, trade routes are shifting, and the U.S. faces new economic challenges.

Containership Calls at U.S. Ports, 2001–2005

From 2001 to 2005, containerships calling at U.S. ports increased 9%, TEUs/calls increased by 18.6%, and million TEUs increased by 29.2%.

Source: U.S. DOT/Maritime Administration



**20-foot equivalent (TEU): A nominal unit of measure equivalent to a 20' by 8' by 8' shipping container.*

Congestion and Capacity Constraints

- Many U.S. ports are struggling to handle larger containerized vessels and increases in international traffic arriving at their terminals. In the past five years, containerships calling at U.S. ports increased by 9%, and the containerships are increasing in size.

- Between 1980 and 2002, truck travel grew by more than 90% while lane-miles of public roads increased by only 5%.

- Air cargo capacity is constrained by the limited availability of new slots at major commercial airports and opposition to airport noise and longer operating hours.

- Each day, trains in America travel more than 1.5 million miles to deliver goods to the marketplace and transport passengers to their destinations. In 2004, the railroad industry set a new high for freight traffic of over 1.66 trillion revenue ton-miles — up nearly 7% from 2003.

Safety

- About 113,000 people are injured each year in freight transportation. Approximately 10% of injuries are the result of non-highway-related accidents.

- About 5,200 people died and 92,000 were injured in crashes involving 139,800 large trucks in 2005. This represents one of the lowest large-truck fatality rates in 20 years — despite more trucks traveling more miles.

- Because most hazardous materials are transported by truck, most incidents related to hazardous materials are on the highways.

- In the first half of 2007, railroads had 246 fewer train accidents, or a 16.8% reduction, compared to the first six months of 2006.

Hazardous Materials and Pipelines

- More than 3 billion tons of regulated hazardous materials — including explosive, poisonous, corrosive, flammable, and radioactive — are transported each year. The hazardous materials shipments range in quantity from several ounces to thousands of tons.

- There are 1.2 million daily hazardous materials movements through the air; on the railroads, seas, and waterways; and over our Nation's highways. Many of these

shipments require transfer between modes. These shipments frequently move through densely populated or sensitive areas where an incident could result in loss of life, serious injury, or significant environmental damage.

- Our Nation's 2.3 million miles of natural gas and hazardous liquid pipelines enable the safe movement of extraordinary quantities of energy products to industry and consumers, literally fueling our economy and way of life. Today, our pipelines are operating near maximum capacity.

Security and Supply Chain Resilience

- Recently passed legislation requires the Federal government to establish a system to inspect 100% of cargo transported on passenger aircraft by the end of fiscal year 2009 and to screen 100% of the containers entering the U.S. either directly or via a foreign port.

- Over 79,000 shipments of goods are processed at our Nation's borders each day, and each presents a potential risk to National security.

- We have already witnessed how non-routine events — manmade and natural events and disturbances — can shut down supply chains and threaten the global economy. There is a growing concern about preparing for, preventing, and responding to disruptions while simultaneously ensuring the supply chain's resilience and its ability to recover.

Pathway to the Future

Corridors of the Future Program (CFP): CFP, one of U.S. DOT's activities under the Congestion Initiative, has the goal of encouraging States to use innovative financing as a tool to reduce congestion on some of our most critical trade corridors.

Improve Freight Safety Operations: By targeting the most frequent causes of train accidents, focusing Federal oversight and inspection resources more precisely, and accelerating research efforts that have the potential to mitigate the largest risks, U.S. DOT will continue aggressive implementation of its proactive National Rail Safety Action Plan.

Target High-Risk Motor Carriers: U.S. DOT is taking a risk-based approach — targeting motor carriers with poor performance and placing special emphasis on motorcoach companies and carriers registered as hauling hazardous materials. Applying a vigorous compliance review and enforcement program in partnership with States is an integral part of the strategy to reduce crashes involving commercial motor vehicles.

Increase Trade and Efficiency at the Mexican Border: U.S. DOT has initiated a cross-border trucking demonstration project that would expand current border operations to allow up to 100 U.S. trucking companies to operate in Mexico and up to 100 Mexican trucking companies to operate beyond commercial zones in the U.S. This gives U.S. trucking companies the opportunity to compete in a new market; it also reduces costs for U.S. consumers and businesses, increases trade efficiency at the border, and maintains safety on America's highways.

Address Pipeline Challenges: Although pipelines have long been a primary mode for high-volume transportation of gasoline and other petroleum products, most biofuels used in the U.S. today are transported exclusively by marine vessel, rail, and/or highway. U.S. DOT will facilitate pipeline options by sponsoring research and development, resolving technical issues, and, if necessary, clarifying safety standards.

Mitigate Environmental Impacts: Efforts need to be directed at mitigating and better managing the environmental health, energy, and community impacts of freight transportation, including noise, air quality, and congestion.

Cooperative Alliances: U.S. DOT is working to mitigate efforts in the Southern California National Freight Gateway Area. Efforts are underway to create a cooperative alliance with government agencies and other stakeholders. U.S. DOT seeks to identify the transportation solutions needed to improve freight transportation throughput in Southern California while attaining healthful air quality and reducing the impact of freight transport on the community.

Secure the Flow of Goods: To protect the Nation from threats to our safety and economy, we must be vigilant in securing the flow of goods into and out of the U.S. while facilitating legitimate travel and trade. We must invest resources where risk is greatest and where they will have the most significant impact. The U.S. will strengthen its strategic approach to cargo security throughout all modes of transportation.

Control Access to Secure Areas of Transportation Infrastructure: DHS' Transportation Worker Identification Credential (TWIC) program will issue biometric credentials to transportation workers requiring unescorted access to secure physical and logistical areas of the transportation system. The program will improve security by establishing a systemwide common secure credential, used across all transportation modes.

Ensure Informed Public and Private Policy Makers: Develop better data, measurement tools, and planning models to help decision makers establish investment priorities and to measure progress toward increased freight reliability, increased freight throughput, and reduced congestion.

Implement Alternative Financing Solutions: Encourage and distribute the results of state and local governments' "best practices" to develop, test, and implement alternative financing of the freight transportation system.

Realizing the Vision: Spotlight on Progress

Improving Freight Safety Operations

"The positive safety trend is, in part, the result of the aggressive implementation of the Department's National Rail Safety Action Plan."

Mary E. Peters
U.S. Secretary of Transportation

As America's economic engine continues to accelerate, increased demands are being placed on our rails in the form of more trains on our tracks than ever before. In order for this economic progress to continue, safety must remain the core principle that guides operations on our Nation's rail system.

The National Rail Safety Action Plan, an aggressive new approach unveiled by U.S. DOT, is focused on improving freight safety operations. The plan targets the most frequent causes of accidents, focuses Federal oversight and inspection resources, and accelerates research into new technologies that can vastly improve safety.

Implementing the plan will help to prevent train accidents caused by human error, improve the safety of hazardous materials shipments, minimize the dangers of crew fatigue, deploy state-of-the-art technologies to detect track defects, and focus inspectors on safety trouble spots.

Under the plan, with guidance from some of the Nation's top rail safety advisors, U.S. DOT has developed a new Federal rule to address human factor accidents. Human error is the largest single factor, accounting for 38% of all train accidents over the last five years. The Federal government is also accelerating research into the role that fatigue plays in accidents to help railroads set better crew schedules.

The plan also focuses on the safe transport of hazardous materials by rail. The railroad industry will now provide local emergency responders with a ranked listing of the top hazardous materials transported through their community. And U.S. DOT has launched a new pilot program providing emergency responders with real-time information about the hazardous materials involved in train accidents.

Another key component of the plan is a new National Inspection Plan for deploying inspectors and resources to safety hot spots before accidents occur. As part of a reinvigorated inspection effort, U.S. DOT is investing in special high-tech rail cars that automatically inspect tracks' integrity as they roll along the rails.

Corridors for the Future: Reducing Congestion, Improving Freight Efficiency

"We are using a comprehensive approach to fighting congestion along these major interstate routes. What we are doing represents a real break from past approaches that have failed to address growing congestion along our busiest corridors."

Thomas J. Barrett
U.S. Deputy Secretary of Transportation

The Corridors of the Future Program (CFP), one of U.S. DOT's major congestion relief initiatives, is aimed at developing innovative National and regional approaches to reduce congestion and improve the efficiency of freight delivery.

Through the CFP, States will explore innovative financing as a tool to reduce congestion on some of our most critical trade corridors, improve the flow of goods across our Nation, and enhance the quality of life for U.S. citizens.

U.S. DOT has an important role to play in facilitating and accelerating the development of these corridors and will help project sponsors break through the institutional and regulatory obstacles associated with multi-State and multimodal corridor investments.

Working together with our public and private sector transportation partners, we can raise the overall value and efficiency of these corridors beyond what would otherwise be achievable on a State-by-State basis.

In September 2007, U.S. DOT announced six interstate routes that will be the first to participate in the CFP.

The selected corridors carry 22.7% of the Nation's daily interstate travel — I-95 from Florida to the Canadian border; I-70 in Missouri, Illinois, Indiana, and Ohio; I-15 in Arizona, Utah, Nevada, and California; I-5 in California, Oregon, and Washington; I-10 from California to Florida; and I-69 from Texas to Michigan.

Formal agreements will be finalized by spring 2008, detailing the commitments of the Federal, state, and local governments involved. These agreements will outline the anticipated role of the private sector as well as how the partners will handle the financing, planning, design, construction, and maintenance of the corridors.

"We believe in a layered approach to security. Our aim is to create rings of protection around the ports and throughout the maritime supply chain — from point of origin to point of destination."

Michael Chertoff, U.S. Secretary of Homeland Security

A Multilayered Approach to Cargo Security

Cargo security is one of the Nation's most critical transportation security challenges. Cargo that is unloaded in a seaport will move quickly to other modes of transportation — a container arriving at a U.S. seaport today can be virtually anywhere in the heartland of America via truck and/or rail tomorrow. Accordingly, security measures must be fully integrated throughout all of the modes of transportation.

In the aftermath of the 9/11 terrorist attacks, the U.S. government began building a new network of protections — a multilayered, multimodal approach to cargo security.

DHS — in coordination and cooperation with Federal, State, and local agencies, foreign government partners, and the maritime industry — has launched key programs to strengthen the security of cargo traveling by ship, plane, truck, and rail, including:

Container Security Initiative (CSI): CSI addresses the threat to border security and global trade posed by the potential for terrorist use of a maritime container to deliver a weapon. The three core elements of CSI are:

– Using automated targeting tools to identify high-risk containers, based on advance information and strategic intelligence.

– Prescreen and evaluate containers before they are shipped.

– Use technology to prescreen high-risk containers to ensure that screening can be done rapidly without slowing down the movement of trade.

Secure Freight Initiative (SFI): SFI is an unprecedented effort to build upon existing port security measures. SFI enhances the Federal government's ability to scan containers for nuclear and radiological materials overseas and to better assess the risk of inbound containers while keeping legitimate trade flowing.

SFI leverages information plus the latest technology to validate the security of goods in maritime shipping containers and reduce the risk of terrorism. SFI's richer pool of container risk data will support more efficient recovery from any attack that might occur.

Port Security Grants: U.S. DOT supports DHS by assisting in awarding grants to port areas for the protection of critical port infrastructure. The program assists ports in enhancing risk management capabilities, heightening maritime domain awareness, and strengthening capabilities to prevent, detect, respond to, and recover from attacks.

Truck Security Grants: The Truck Security Program promotes security awareness among all segments of the commercial motor carrier and transportation community. Through this program, the Nation's transportation community will be trained to observe and report any suspicious activities or items that may threaten critical elements of the highway system.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Metro Transit

Financing and Partnerships

The Vision

The transportation system will have a stable revenue stream capable of handling the incredible growth in passenger and freight demand that is heading our way. There will be a clear link between costs and revenues. The system will be flexible as costs change and nimble when making adjustments required by its customers.

New Directions in Financing and Partnerships

Shift Toward a New Model for Financing the U.S. Transportation System

- Faced with budget constraints and deficits, governments will need to turn further to innovative financing mechanisms to meet many of their transportation capital investment needs. The cost of ensuring infrastructure capacity and system performance over the next two decades will be increasingly expensive. New financing solutions will be sought nationwide.

- There is overwhelming recognition that the U.S. needs a new model for financing the National transportation system. The current gas-tax-dependent model does virtually nothing to directly address the growing costs of congestion and system unreliability. Revenues from airport passenger and user fees are also lagging behind. Sole reliance on approaches from the past cannot continue.

- Some of the evolving financing mechanisms will fall entirely within the realm of either the public or private sectors, but many will involve some form of public-private partnership. These partnerships will allow the government to draw upon private sector equity and expertise in the delivery, operation, and maintenance of the transportation system.

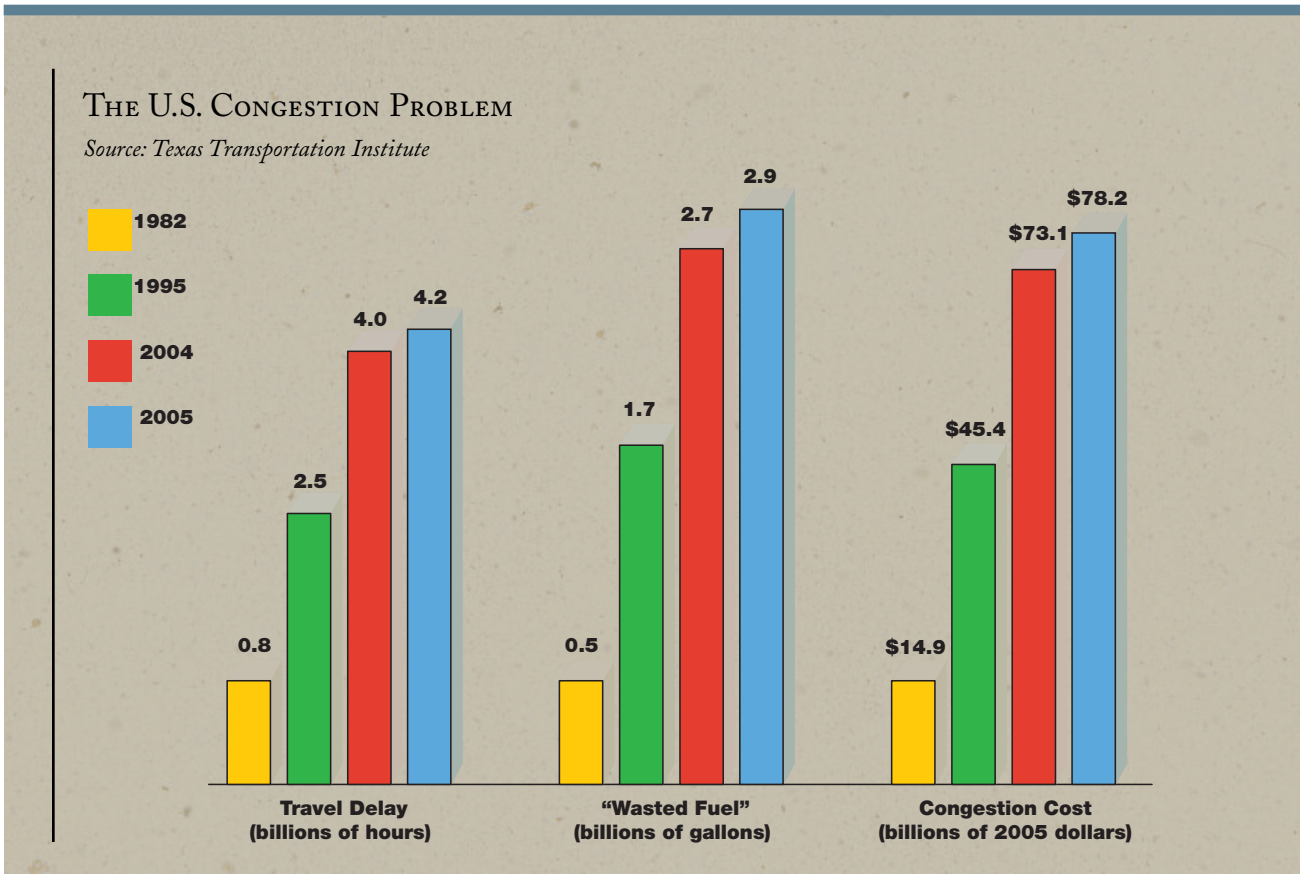
Pathway to the Future

Expand Public-Private Partnerships: Reduce existing impediments and provide incentives to States willing to partner with industry to develop transportation projects. Partnerships can supply a vast amount of investment resources, add discipline to the project selection process, and promote innovation.

Direct Pricing of Road Use: Permit States and localities to implement direct, cost-based pricing of road use on all highways. This can be achieved through tolling, metering devices, and other innovations. The costs of congestion, maintenance, construction or reconstruction, and environmental impacts can be considered when developing pricing strategies. Revenues can be leveraged to fund major system improvements and attract additional investment.

Simplify Programs and Increase Flexibility: Promote fewer, more focused Federal programs that simplify process requirements and target congestion reduction and safety. Remove restrictions that add limited value and simply frustrate States' attempts to implement their own transportation programs. Reward jurisdictions that are willing to use creative approaches and new technologies to tackle congestion and highway safety.

Make Decisions Based on Merit: Federal funding priorities should be given to merit-based, cost-beneficial projects, not pet political projects.



Reducing Delays through Congestion Pricing

Congestion pricing benefits society as a whole. It benefits drivers and businesses by reducing delays and stress, by increasing the predictability of trip times, and by allowing for more deliveries per hour.

It benefits mass transit by improving transit speeds and the reliability of transit service, increasing transit ridership, and lowering costs for providers.

It benefits State and local governments by improving the quality of transportation services without tax increases or large capital expenditures, by providing additional revenues for funding transportation, by retaining businesses and expanding the tax base, and by shortening incident response time for emergency personnel, thus saving lives.

All of us benefit from the reduction of fuel consumption and vehicle emissions. Examples of effective congestion pricing programs in the U.S. include:

Tolling: Single-occupant vehicles pay a per-trip fee each time they use the I-15 High Occupancy Toll (HOT) lanes. Tolls vary with the level of traffic demand on the lanes. Half of the revenue from the HOT Lanes in San Diego supports transit service in the corridor.

Bridge Pricing: On the Midpoint and Cape Coral bridges in Lee County, Florida, travelers were offered a 50% discount on their toll if they traveled during specific periods and paid their toll electronically. The toll structure encouraged drivers to shift from peak periods to off-peak discount periods.

Mileage-Based Pricing Test: The State of Oregon is studying mileage-based fees and peak-period driving charges designed to reduce traffic during the most congested periods while raising revenue to replace existing fuel-based fees. Global Positioning System (GPS)-based technology is being tested.

Expanding Public-Private Partnerships

Public-private partnerships (PPPs) refer to contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery of transportation projects. Today, 23 States have some form of legislation that authorizes PPPs in transportation.

Expanding the private sector role allows public agencies to tap private sector technical, management, and financial resources in new ways to achieve certain public agency objectives such as greater cost and schedule certainty, supplementation of in-house staff, innovative technology applications, specialized expertise, and access to private capital.

The private partner can expand its business opportunities in return for assuming the new or expanded responsibilities and risks. Some of the primary reasons for public agencies to enter into public-private partnerships include:

– Accelerating the implementation of high-priority projects by packaging and procuring services in new ways.

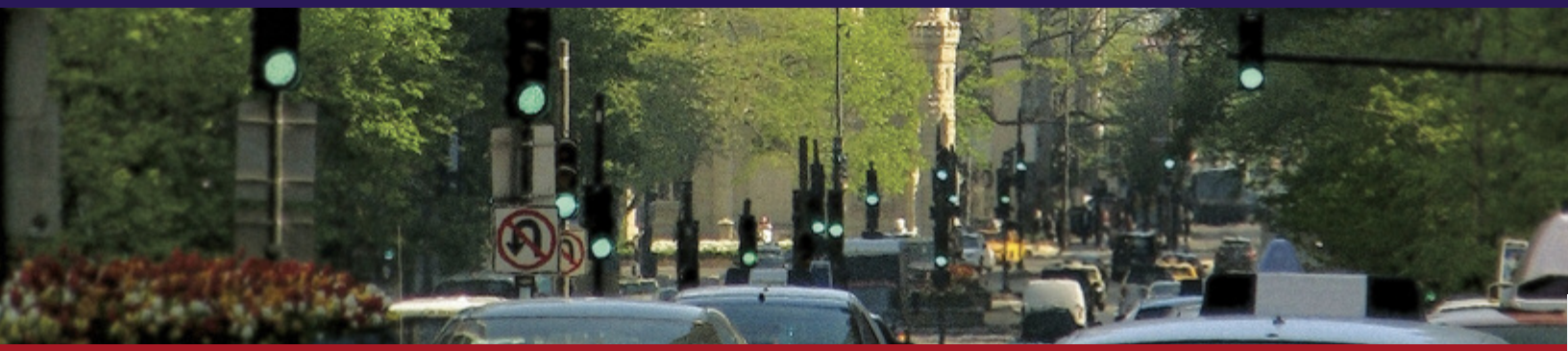
– Turning to the private sector to provide specialized management capacity for large and complex programs.

– Enabling the delivery of new technology developed by private entities.

– Drawing on private sector expertise in accessing and organizing the widest range of private sector financial resources.

– Encouraging private entrepreneurial development, ownership, and operation of highways and/or related assets.

PPPs specify the roles, risks, and rewards contractually so as to provide incentives for maximum performance and the flexibility necessary to achieve the desired results.



"To meet America's future needs, our Nation must take advantage of scientific and technological innovation to improve existing transportation systems and develop new ones. We must strive to enhance their reliability and efficiency and close the gap between the demand for transportation and the capacity of the transportation infrastructure."

President George W. Bush

Technology and Innovation

The Vision

An innovative U.S. transportation system that incorporates efficient, integrated, cost-effective, sustainable, and intermodal transportation solutions. Continued introduction of new concepts and new technology will lead to dramatic improvements in our Nation's world-class transportation system.

New Directions in Transportation Technology and Innovation

- Innovations that will meet the challenges of the transportation system in 2030 involve the transformation of knowledge into new products, processes, and services to serve the public more effectively.

- As we work to bring about transformation and innovation in the transportation enterprise, we must recognize that while technology plays a significant role, it is only one component of a complex process. There is no technological silver bullet that will solve our transportation challenges.

- The transformation of the transportation system requires a holistic planning and implementation approach involving all the constituent stakeholders, including the people whose lives will be affected.

- The real foundation of continuing innovation is people. The U.S. remains the most attractive country in the world for talented young scientists to start their research careers and our universities rank among the best in the world.

Pathway to the Future

Intelligent Transportation Systems (ITS): ITS encompass a broad range of wireless and wire line communications-based information and electronics technologies. When integrated into the transportation system, these technologies relieve congestion, improve safety, and enhance American productivity.

Congestion Reduction: Develop, demonstrate, and deploy innovative pricing and financing programs to reduce congestion.

Next Generation Air Transportation System (NextGen): Achieve greater aviation throughput, capacity, and productivity; reduce user and service costs; and ensure a safe, secure, and environmentally compatible aviation system through implementation of NextGen.

Energy Efficiency and Alternative Fuels: Improve fuel efficiency; identify requirements for alternative fuel infrastructures, including hydrogen; and assess safety and environmental impacts of alternative fuel vehicles and the supporting systems.

Application of Enhanced Transportation Safety Data and Knowledge: Convert the data produced by digital technology applications into useful knowledge to improve safety. Provide local transportation agencies with the tools for assembling transportation plans and assessing the performance of their systems.

Human-Automation Interaction: Conduct and support research leading to increased understanding of human-machine interactions related to safety performance across all transportation modes.

System Resilience and Global Logistics: Identify freight bottlenecks and changing transportation patterns, and develop and implement technologies to enhance passenger and cargo flow in the wake of manmade and natural non-routine events.

Expand the Knowledge Base: Invest in university-based centers of excellence, including the University Transportation Centers (UTCs), to advance innovation, research, education, and technology transfer and to prepare the future transportation workforce.

Small Business Solutions: Through the Small Business Innovation Research (SBIR) program, invigorate small businesses in the U.S. to ensure that new technologies focus on smart transportation solutions.

Improving the Safety and Efficiency of the Road Transportation System

Today, nearly half of the annual fatalities on U.S. highways are caused by roadway departure and intersection-related incidents. The ITS program advances the application of advanced technologies to surface transportation.

A major component of ITS is the Vehicle Infrastructure Integration (VII) Initiative, a cooperative effort between Federal and State transportation departments and automobile manufacturers. Together we are evaluating the feasibility of deploying a communications system that will be used for improving the safety and efficiency of the Nation's road transportation system.

Specific applications are being developed to test a broad variety of potential safety and mobility uses of the VII system, including:

– Warning drivers of unsafe conditions or imminent collisions.

– Warning drivers if they are about to run off the road or take a curve too fast.

– Informing system operators of real-time congestion, weather conditions, and incidents.

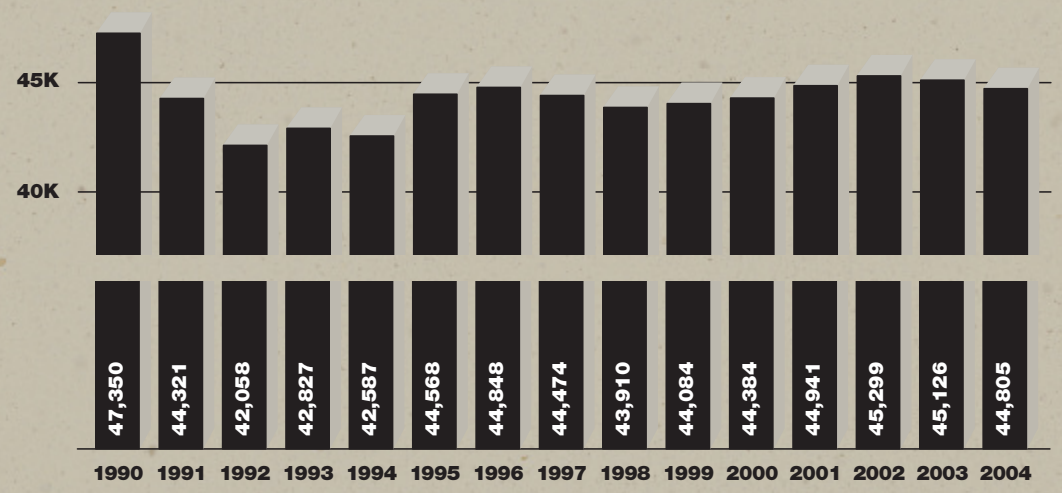
– Providing operators with information on corridor capacity for real-time management, planning, and provision of corridorwide advisories to drivers.

Development of a cost-benefit model for the VII system is ongoing. In parallel, the auto industry is undertaking its own efforts to investigate the viability of VII. Efforts to define suitable business models, privacy policies, deployment strategies, and management models for a National system are well underway.

U.S. Transportation Fatalities, 1990–2004

Fatalities recorded in all transportation modes are estimated to be 45,026 in 2006. Highway fatalities represented about 95% of these recorded fatalities.

Source: U.S. DOT/Research and Innovative Technology Administration



Realizing the Vision: Spotlight on Progress

Developing a Hydrogen-Powered Transportation System

Today we are on the verge of a revolution that has the potential of eclipsing even the changes brought about by the silicon chip. We are talking about a new era, an era in which our burgeoning energy needs are met and our infrastructure continues to grow while we maximize energy efficiency and preserve our environment.

U.S. DOT is playing a vital role in meeting President Bush's commitment to developing a hydrogen-powered transportation system. Government agencies are collaborating to make the hydrogen economy a reality. Hydrogen presents opportunities to meet America's strategic transportation goals, including:

– Developing regulations that help to ensure the safe design and operation of hydrogen vehicles and infrastructure.

– Offering opportunities to deploy vehicles where air quality restrictions prohibit conventional technology.

– Reducing transportation's impact on the environment through use of fuel-cell buses and heavy-duty vehicles.

– Transitioning to a hydrogen economy, which will involve global partnerships that span continents and borders.

Today we are looking into the best ways to use fuel cells to power heavy vehicles. This work has already put fuel-cell buses on the road and may soon put new fuel-cell-powered vehicles on our rails and waterways. These developments are providing answers to communities searching for clean, safe, sustainable transportation solutions.

As hydrogen technology advances at a revolutionary pace, the Federal government will keep our commitment to safety. That is why we are leading the way in considering improvements in the design, construction, and testing of pipelines and in demonstrating and deploying new and safer hydrogen distribution and delivery systems, including high-pressure composite storage systems.

Ensuring a Stable Supply of Aviation Fuels

Aviation needs to move toward reducing the impacts from its emissions. We need to invest now to ensure that we have a pipeline of innovations that will bring about the results we need.

The Commercial Aviation Alternative Fuels Initiative (CAAFI) has been established by U.S. DOT to develop a roadmap on the viability of alternative fuels for aviation. CAAFI brings together manufacturers, airlines, airports, the Department of Defense, the Department of Energy, and the Environmental Protection Agency.

Two major alternative aviation fuel studies are currently underway.

The first study looks at the feasibility, costs, barriers, and technical issues associated with the transition to alternative aviation fuels. It will answer the key questions that need to be considered before taking big steps.

The second study explores environmental impacts. Without this kind of quantification, it's difficult to set meaningful goals with meaningful schedules.

The U.S. Air Force is committed to certifying its entire fleet of aircraft to fly on a synthetic fuel by 2011.

By 2025, oil shale and ethanol blends will be evaluated for their applicability to aircraft.

Long-term, hydrogen fuel is being evaluated for use in turbine engines.

CAAFI is leading efforts to develop alternative fuels to ensure an affordable and stable supply of environmentally progressive aviation fuels.

Investing in University-Based Centers of Excellence

The University Transportation Centers (UTCs), U.S. DOT's largest university program, conduct basic and applied research to advance U.S. technology and expertise in the many disciplines that transportation comprises. The Centers expand the body of knowledge in transportation; conduct education programs to expand the transportation workforce; and provide capacity-building programs to existing transportation professionals.

The UTC program invests in university-based centers of excellence to advance innovation, research, education, and technology transfer. Congress authorized the most significant expansion of the UTC program to date, increasing the funding for the program and the number of UTCs from 33 to 60. The expansion of the UTC program presents new opportunities for the program to make an even greater contribution to transportation research, education, and technology transfer.

Each UTC has a specific transportation theme that advances one of DOT's National strategic objectives and is in step with Federal transportation agencies to ensure that university research and innovation can address some of the most critical National transportation challenges. The themes range from Multimodal Solutions for Congestion Mitigation to Sustainable Freight Transportation Infrastructure Systems to Planning and Management of Regional Transportation Systems.

Invigorating Small Businesses to Develop Smarter Transportation Solutions

U.S. DOT's Small Business Innovation Research (SBIR) program provides funding to small businesses to develop commercially viable technologies that will meet the Nation's transportation needs. The goals of the program are to strengthen the U.S. economy by invigorating America's small businesses and to ensure that technologies developing out of this unique program will focus on safer, simpler, and smarter transportation solutions.

DOT is one of 11 Federal agencies that provide research and development funds to the entrepreneurial sector for innovative proposals. Although small businesses are a frequent source of technological innovation, many lack the necessary funding to support their research.

SBIR provides small businesses with funding through the start-up and development stages of their research and encourages commercialization of resulting products. Past recipients of SBIR funding have developed innovative transportation solutions in areas such as emergency-window exits for passenger rail cars, technology to maintain cost-effective pavement networks, and a tool to manage traffic flow and access to roadways.

This document builds upon a strong foundation of supporting documentation and data prepared by a number of key agencies. Special thanks to:

Executive Office of the President

Office of the Secretary of Transportation

Research and Innovative Technology Administration

Federal Aviation Administration

Federal Highway Administration

National Highway Traffic Safety Administration

Federal Railroad Administration

Federal Transit Administration

Federal Motor Carrier Safety Administration

Maritime Administration

Pipeline and Hazardous Materials Safety Administration

St. Lawrence Seaway Development Corporation

Office of the Inspector General, U.S. Department of Transportation

U.S. Department of Energy
- Energy Information Administration

U.S. Department of Homeland Security
- U.S. Customs and Border Protection
- Transportation Security Administration

U.S. Census Bureau

Next Generation Air Transportation System
- Joint Planning and Development Office

Safety
System Performance
21st Century Solutions

"The United States has the world's largest and most capable transportation system. Those systems have enabled unprecedented growth in domestic and international trade, have brought our diverse States closer and closer together, and have provided a critical foundation for the amazing wealth creation and economic prosperity that has taken place in the U.S. and around the world in the last 60 years. … To reverse the decline in our transportation systems, we need to look beneath the surface and explore the foundation of the problems we are facing."

Mary E. Peters
U.S. Transportation Secretary