The efficient movement of freight is central to an effective transportation system and essential to a robust economy. Manufacturing, agriculture, retail and industry all depend upon reliable freight movement to function.

The Texas A&M Transportation Institute is a leader in multimodal freight research and an innovator in exploring new ways of moving freight across the nation and around the world.
Texas A&M Transportation Institute’s (TTI) Freight Shuttle System

TTI has developed a new freight transportation system: the Freight Shuttle System (FSS). The FSS’s electrically powered motors will not add to existing pollution, will advance the United States’ effort to achieve energy independence, and will allow more environmentally friendly energy choices.

1.3 billion metric tons of foreign trade
805 million metric tons of domestic trade

2011 Waterborne Commerce

2011 Waterborne Commerce

1.3 billion metric tons of foreign trade
805 million metric tons of domestic trade

U.S. Freight Stats

54 million tons of freight moved nationwide each day ($46 billion in value)

Public Sector
- Texas Department of Transportation
- Texas Department of Public Safety
- Port Authorities
- Transportation Research Board
- U.S. Department of Energy
- U.S. Department of Transportation
- U.S. Environmental Protection Agency
- U.S. Federal Highway Administration
- Inter-American Development Bank
- National Cooperative Highway Research Program

Private Sector
- Association of American Railroads
- Transportation Technology Center Inc.
- Class I railroads: BNSF Railway, CSX
- National Waterways Foundation
- U.S. Soybean Export Council
- Private consultants

40 tons/person
How much freight the U.S. needs to move annually

67% of tons moved by trucks in the U.S. (63% of freight by value)

100 miles or less distance moved per shipment by 51% of total freight tons

67% of U.S. foreign container tons moved through top 5 U.S. container ports in 2011

Ton-Miles Traveled per Gallon of Fuel

616 Inland Barge
478 Rail
150 Truck

A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001–2009, Prepared for the National Waterways Foundation, Center for Ports and Waterways, Texas Transportation Institute, February 2012, Figure ES-4, p 5.
<table>
<thead>
<tr>
<th><strong>Representative Projects</strong></th>
<th><strong>NAS (NSCRP 42)</strong></th>
<th><strong>EPA</strong></th>
<th><strong>TxDOT</strong></th>
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<tbody>
<tr>
<td>Incorporating Surface Transportation Considerations into Navigation Project Budgeting</td>
<td>This project developed methodologies that (1) linked the performance of the U.S. maritime transportation system (MTS) with the performance of the U.S. freight transportation system and (2) could be used to identify MTS maintenance investment strategies that improved the efficiency of the overall freight transportation system. Researchers prepared methodologies that bridged the available waterborne commerce statistical data with equivalent land-side, multimodal transportation data to support system-level intermodal freight mobility, including the identification of appropriate related MTS maintenance investment strategies.</td>
<td>Truck Engine Idle Reduction Technology Demonstration Program</td>
<td>Extended truck idling wastes fuel and generates emissions of greenhouse gases and pollutants. This project produced prediction methodologies to assess the effectiveness of truck stop electrification (TSE) as a strategy to reduce these harmful effects. TTI research showed that a truck stop with TSE can reduce daily fuel consumption by 167 gallons, oxides of nitrogen emissions by 24.5 kg, and carbon dioxide emissions by 2.1 tons.</td>
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</table>
In a series of projects, TTI provided expert analysis for local emergency planning committees in a number of Texas counties. This included review of local emergency plans and analyses of hazardous-material commodity flows within each county, providing valuable information to inform the emergency plans of community leaders and first responders.

<table>
<thead>
<tr>
<th>Texas DPS (Division of Emergency Management)</th>
<th>Hazardous Materials Commodity Flow Studies and Emergency Planning</th>
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<tr>
<td><strong>TTI developed</strong>, tested, and implemented a system to consistently measure commercial vehicle crossing times at the U.S.-Mexico border. The system was originally piloted at the Pharr/Reynosa and El Paso/Ciudad Juarez ports of entry and is currently in operation at seven commercial international crossings in Texas. TTI sought input from key stakeholders to develop an information system to disseminate border-crossing information, seeking input from key stakeholders — carriers, shippers, and U.S. and Mexican federal and state agencies.</td>
<td></td>
</tr>
<tr>
<td><strong>TTI contributed</strong> to the Houston Region Freight Study, an extensive inventory and operational modeling study that identified a series of infrastructure improvements to improve the safety and fluidity of the freight rail system in the greater Houston region. TTI continues to provide support services to the Gulf Coast Rail District to update the business case for grade crossing separation and improvement projects outlined in the original study.</td>
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<td><strong>The Secure Border Trade</strong> Demonstration Project is a three-year effort funded with Coordinated Border Infrastructure funds administered by FHWA and implemented by the County of El Paso. As part of this $3.6 million project, TTI will assist the County of El Paso with project management, stakeholder facilitation and the implementation of a technology-monitoring system for the project. The project seeks to move vehicle and cargo monitoring away from the border by providing more information across the entire supply chain and software-enhanced analysis of data for customs and border security agencies.</td>
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</table>
TTI is home to 10 state and national research centers, all approved by The Texas A&M University System Board of Regents. These centers help illustrate the depth and breadth of the Institute’s capabilities. The products and recommendations generated by these centers enhance the economy and improve quality of life.

The following four centers specialize in freight transportation research.

<table>
<thead>
<tr>
<th>NAFTA Trade in 2013</th>
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<tbody>
<tr>
<td>U.S. to Canada</td>
<td>$300 billion</td>
</tr>
<tr>
<td>Canada to U.S.</td>
<td>$332.1 billion</td>
</tr>
<tr>
<td>U.S. to Mexico</td>
<td>$226.7 billion</td>
</tr>
<tr>
<td>Mexico to U.S.</td>
<td>$280.5 billion</td>
</tr>
</tbody>
</table>


Center for Railway Research
TTI’s Center for Railway Research (CRR) studies, develops, and applies new and emerging technologies to solve rail industry problems. The center’s researchers and industry experts conduct basic research to develop technologies to improve the safety, reliability and economics of rail transportation and perform technology scanning to identify emerging technology for the railroad industry. CRR researchers investigate a variety of rail issues, such as multimodal integration of railroads, optimization of warning signal performance, and enhanced safety in all facets of operation.

Established in 1950, TTI has a long, successful history of performing groundbreaking research on a wide range of significant transportation issues.
Center for Ports and Waterways

With 11 deepwater seaports and more than 1,000 miles of inland waterways, Texas’ waterway system plays a vital role in the state’s economy. To help preserve Texas’ vital waterborne economic components and position industry to take advantage of opportunities for growth, TTI’s Center for Ports and Waterways (CPW) provides valuable applied research at the local, regional and national level. CPW’s proven track record of research, technology transfer and implementation is a valuable resource for the maritime industry. From local issues in water transportation to homeland security, TTI and CPW are uniquely qualified to help ensure the safety, efficiency and productivity of our nation’s maritime interests.

Center for International Intelligent Transportation Research

As economies become more global, challenges faced by international urban centers like El Paso become more pressing. These challenges drive the innovation and discovery at the heart of the work of TTI’s Center for International Intelligent Transportation Research (CIITR). Established by the Texas Legislature in 2006, CIITR seeks to:

- maintain and improve mobility in the face of growing traffic and shrinking resources,
- increase border-crossing efficiency while maintaining security, and
- improve air quality to advance personal health.

Transportation Policy Research Center

The Texas Legislature created the Transportation Policy Research Center at TTI to provide for a sustained, independent and objective capability in policy analysis to help decision makers address the state’s current, near-term and long-range transportation challenges. Because the state has become increasingly dependent on the efficient movement of goods to enhance global competitiveness, PRC’s work encompasses the public policy implications of freight movement across all modes.

TTI’s research in this area aspires to help inform policy decisions and ensure an efficient multimodal and intermodal freight transportation system. Initial work in this area focuses on issues related to oversize/overweight trucks, public use of rail right-of-way in urban areas, and the competitiveness of Texas’ exports, including port trade.

TTI by the Numbers

$56.9M  Research Expenditures
400+  Professional Researchers
200+  Students
>600  Projects Annually
200+  Public and Private Sponsors
Established in 1950, TTI has a long, successful history of performing groundbreaking research on a wide range of significant transportation issues. TTI employs approximately 400 professional researchers with significant expertise in all disciplines impacting transportation, such as technology, engineering, planning, economics, policy, landscape architecture, environmental sciences and the social sciences. Since the inception of TRB’s Cooperative Research Program, TTI has been the largest participant in NCHRP, and some 80 TTI researchers lead or serve on TRB committees.

The Institute offers objective, credible guidance through its 10 state and national research centers and state-of-the-art facilities, including full-service safety proving grounds, an environmental and emissions testing facility, a sediment and erosion control laboratory, and numerous other facilities and laboratories. The Institute annually works on more than 600 transportation research projects totaling more than $56 million. At any one time, TTI has research sponsors in about 30 states, and has conducted research for sponsors in all 50 states and more than 28 foreign countries.

**TTI’s Mission**

To identify and solve transportation problems through research, to transfer technology and knowledge, and to develop diverse human resources to meet the transportation challenges of tomorrow.

**Contact**

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