

FREIGHT DATA RESEARCH FUNDED THROUGH THE UNIVERSITY TRANSPORTATION CENTERS

The following are the results of an online review to identify freight data related research projects funded through the Research and Innovative Technology Administration's (RITA) University Transportation Centers (UTC) Program. The purpose of this review is to:

- Identify UTC-funded research projects specific to the identification, collection, and use of freight data commencing in 2005 or later.
- Reveal topical and geographic trends of UTC freight data research.
- Propose areas of future academic freight data research.

Research projects listed on the websites of each of the 67 UTCs were reviewed. A total of 101 freight data related research projects were identified in 33 UTCs. The research projects are classified into 12 topical categories to assist with revealing trends and determining which categories require improvement. These categories are listed below and ranked from highest number of research projects to lowest.

Project Category	Number of Projects	Number of UTCs
1 Rail & Intermodal	20	11
2 Logistics & Goods Movement	17	13
3 Modeling	17	13
4 Traffic, Congestion, & Capacity	16	10
5 Regulation & Enforcement	14	9
6 Technology	14	10
7 Economics & Social Impacts	12	10
8 Marine, Air, Inland Ports, & Inland Waterways	10	7
9 Data Sources, Data Integration, & Performance Measures	9	7
10 Safety, Security, & Land Border	9	8
11 Environment	7	6
12 Infrastructure Design & Management	7	5

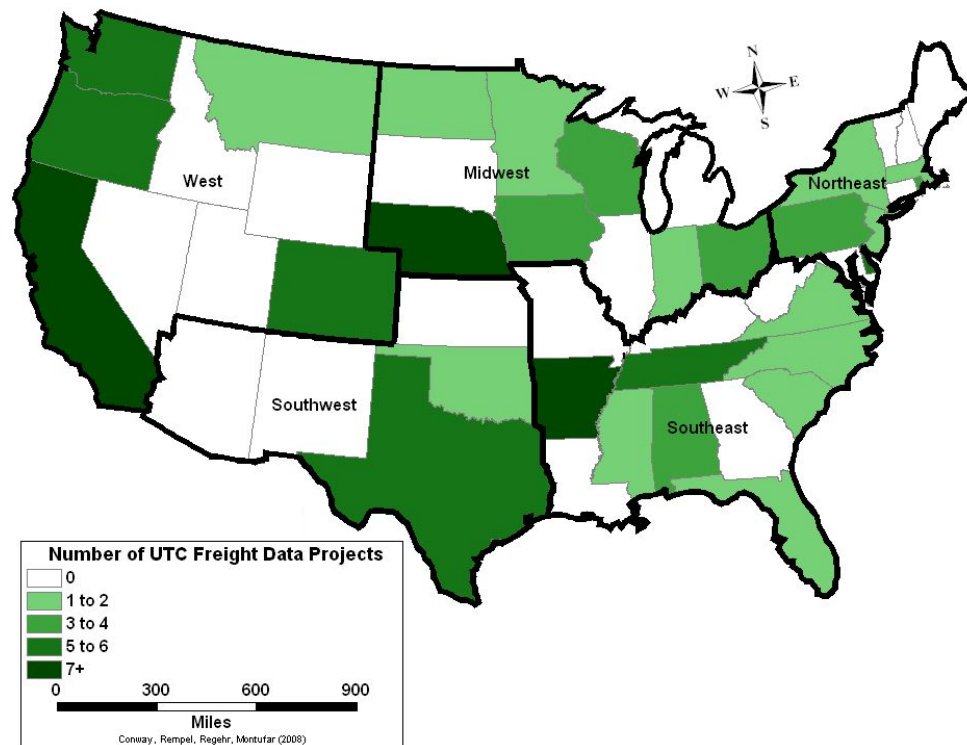
What types of freight data research projects are being performed?

- 9 projects specific to identifying and integrating freight data sources.
 - 4 projects develop regional freight databases.
 - 3 projects develop freight performance measures.
 - 1 project integrates border freight data.
 - 1 project examines air cargo data sources.
- 14 projects specific to collecting freight data.
 - Nearly all projects examine commercial vehicle identification, classification, and weighing technologies.
- All projects examine freight data applications.
 - Most projects use freight data for modeling logistics and goods movement.
 - Projects also use freight data for traffic, congestion, and capacity analyses.
 - Projects are primarily regional, with some national and urban focus.
- Highway, rail, and intermodal are most common modes being researched.

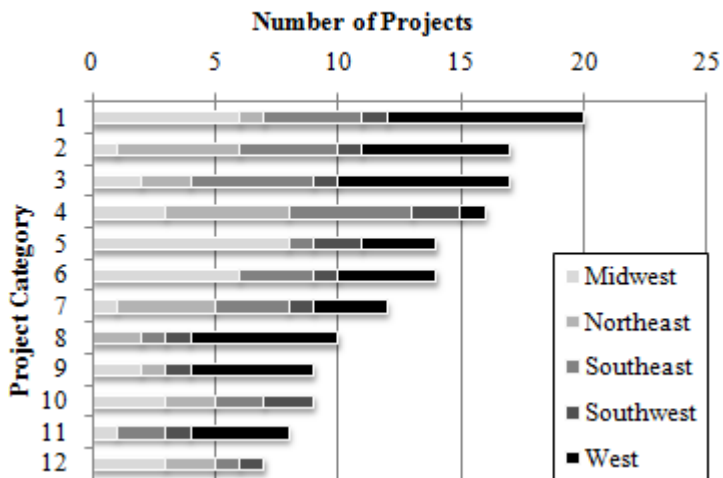
Where is freight data research being performed?

The map on the next page illustrates the intensity of UTC freight data research by state where the funding UTC is located. The chart below the map provides information regarding the type of research being funded by UTCs located in each region of the United States. Highlights of the geographic trends are listed below:

- Research related to freight data traffic and congestion is concentrated in Eastern UTCs.
- Regulation, enforcement, and technology studies are concentrated in Midwestern UTCs.
- Research related to marine and air freight is concentrated in Western UTCs.
- Rail and intermodal studies are primarily conducted in Western, Southeastern and Midwestern UTCs.



Regional Project Distribution



What areas of UTC freight data research are lacking?

- Very few studies are being performed to identify new non-ITS sources of truck freight data.
- Although technology studies are underway to examine new technologies for collection of truck freight data, studies generally focus only on very specific individual applications for this new data.
- Very little research is underway examining applications of air, marine, and inland waterway freight data.
- No projects focus on identifying rail, intermodal, marine, and inland waterway freight data sources.
- Few studies are being completed to examine data needs and applications for performance measures.

What are some future directions for UTC freight data research?

Major areas of research need that could be addressed at the University level include:

- Identifying appropriate performance measures for single and multi-modal freight movements and the data requirements for their calculation.
- Further development of integrated databases from varied sources at a national, regional, or local level.
- Refining databases and researching mechanisms for sharing of ITS data between multiple potential applications (e.g. enforcement, planning).
- Continuing development of analytical tools such as optimization and GIS-based models.

If you are interested in a detailed list of projects, please contact:
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NATIONAL RESEARCH ON FREIGHT TRANSPORTATION DATA

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National research on methods of collecting, estimating, and forecasting freight transportation data include research programs of federal agencies and the Cooperative Research Programs administered by the Transportation Research Board (TRB). The following summary does not include similar research conducted in the private sector to support proprietary data and forecasting systems.

Most freight transportation data research in federal agencies directly supports development of national data sets or national forecasting. The Census Bureau conducts occasional studies of recordkeeping practices to improve data collection for the Economic Census and for annual surveys of business establishments. The Bureau of Transportation Statistics works with Census on development of methods to improve the Commodity Flow Survey and to summarize results. The Federal Highway Administration develops methods to extend the Commodity Flow Survey into a complete picture of current flows and to forecast future flows in its Freight Analysis Framework. The U.S. Department of Agriculture develops applications of input-output tables to monitor and forecast agricultural moves, and the Army Corps of Engineers conducts similar research to forecast waterborne commerce and analyze the impacts of investments in ports and inland waterways. The U.S. Department of Energy develops methods to support the National Energy Modeling System. These research activities are often driven by the 5-year cycle of the Economic Census and other data sources. For example, redesign of the Freight Analysis Framework will be completed in the summer of 2009 and implementation begun in the fall so that 2007 Commodity Flow Survey data can be incorporated into the estimates shortly after the data become available in December 2009.

Some freight transportation data research in federal agencies supports state and local data collection, estimation, and forecasting, either to meet federal requirements or to extend national data sets for local applications. The Environmental Protection Agency develops models for use by local agencies to estimate air quality as part of required conformity analysis. The Federal Highway Administration sponsors the Freight Model Improvement Program and publications such as the Quick Response Freight Manual to develop methods for measuring local detail beyond the resolution of the Freight Analysis Framework and for developing local forecasts.

Most research on state and local collection, estimation, and forecasting of freight transportation data is conducted through the National Cooperative Highway Research Program, the National Cooperative Freight Research Program, and the Hazardous

Materials Cooperative Freight Research Program. Current projects emphasize methods for collecting commodity flow data, for sharing and integrating data, and for forecasting demand.

Some federal agency research is closely coordinated with the Cooperative Research Programs. For example, the Federal Highway Administration is developing a compendium of approaches used by public agencies to obtain access to data from private businesses, which will be extended by a National Cooperative Freight Research Project into a more in-depth look at legal issues.

National research currently underway will result in an improved picture of region-to-region commodity flows, methods for state and local agencies to obtain local detail on their portions of the commodity flows, methods for sharing freight data, and methods for relating freight activity to land use and to air quality issues and greenhouse gas emissions. Several research projects, especially in the National Cooperative Freight Research Program, will require extensive follow-up. Specifications for Freight Transportation Data Architecture will lay out specific areas such as commodity classification and modal definitions that must be developed further to provide a framework for integrating data. Freight-Demand Modeling to Support Public-Sector Decision Making will provide modest improvements to existing methods, but initiate only preliminary work on needed new methods. Strategies for Measuring Costs of Freight Transportation will lay out a road map for others to follow with detailed designs of data collection programs.

Other areas of freight transportation data warranting further research include: improved methods for measuring freight activity through remote sensing from above, from roadside sensors, and from in-vehicle monitors; use of experimental and quasi-experimental designs for obtaining effective performance measures for freight programs; and new approaches to estimating the domestic movement of international trade.

USDOT Projects Related to FREIGHT DATA

CFS Respondent Study	Improve understanding of record keeping and reporting practices to improve CFS design.	RITA/BTS underway
Freight Analysis Framework Redesign	Evaluate version 2 of the Freight Analysis Framework (FAF2) and develop improvements for the next version (FAF3).	FHWA underway
VIUS Estimates for 2007	Estimate selected tables for 2007 from the discontinued Vehicle Inventory and Use Survey (VIUS) based on trend analysis of VIUS data and correlations with related data series.	FHWA underway
Port Drayage Estimates	Develop methods for estimating the inland move of imports. The methods are to be used for the next version of the FAF.	FHWA underway
Freight Model Improvement Program (FMIP)	Compile information on current freight models, modeling research, and supporting data collection and posting the information on www.fmip.gov .	FHWA underway
Accessing Private Data	Compendium of Methods for Accessing Private Data for Transportation Planning	FHWA underway
Electronic Freight Management (EFM)	Develop and test open-source system for sharing shipping documents among supply chain partners	RITA/ITS Joint Program Office and FHWA underway
Railroad Close Calls Reporting	Develop an incident reporting system for close calls on railroads.	RITA/BTS underway
Hazmat Data Fusion Center	Establish a center for obtaining and integrating hazmat-related information	PHMSA underway

Active or Approved Cooperative Research Program Projects Related to FREIGHT DATA in 2008

NCHRP 08-36/Task 65	Best Practices for Incorporating Commodity Flow Survey and Related Data into the MPO and Statewide Planning Processes	Active, due in 2008
NCHRP 08-36/Task 70	Scoping Study for Statewide Travel Forecasting National Model	Completed 2008, report on web
NCHRP 08-36/Task 73	Adding Resilience to the Freight System in Statewide and Metropolitan Transportation Plans: Developing a Conceptual Approach	Pending
NCHRP 08-36/Task 79	Scoping Study for a Freight Data Exchange Network	Active, due in 2008
NCHRP 08-56	Truck Noise-Source Mapping	Active, due in 2008
NCHRP 20-5 Synthesis topic 38-07	Forecasting Metropolitan Commercial and Freight Travel	Active, due in 2007
NCHRP 20-5 Synthesis topic 40-09	Freight Transportation Surveys, Methods and Guidelines	Active, research to start 2009
NCFRP 03	Performance Measures for Freight Transportation	Active, due 2009
NCFRP 06	Freight-Demand Modeling to Support Public-Sector Decision Making	Active, due 2009
NCFRP 11	Current and Future Contributions to Freight Demand in North America	Pending, proposals in review
NCFRP 12	Specifications for Freight Transportation Data Architecture	Active, due 2010
NCFRP 16	Representing Freight in Air Quality and Greenhouse Gas Models	Active, due 2009
NCFRP 09-002	Legal Aspects of Accessing Private Data for Transportation Planning	Pending
NCFRP 09-003	Industry Benchmarking as a Tool to Promote Environmental Goals in Freight Transportation	Pending
NCFRP 09-004, 038	Resources and Procedures for Developing Local Commodity Flow Databases	Pending
NCFRP 09-016	Strategies for Measuring Costs of Freight Transportation	Pending
NCFRP 09-019	Truck Idling Study Design	Pending
HMCPRP 01	Hazardous Materials Commodity Flow Data and Analysis	Active, due 2009
HMCPRP 02	Hazardous Materials Transportation Incident Data for Root Cause Analysis	Active, due 2009
HMCPRP 05	Evaluation of the Potential Benefits of Electronic Shipping Papers for Hazardous Materials Shipments	Active, due 2010

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP projects: www.trb.org/CPR/NCHPR/NCHRPPProjects.asp

NCHRP completed synthesis projects: www.trb.org/Studies/Synthesis/SynthesesNCHRPComplete.asp

NCHRP active synthesis projects: www.trb.org/Studies/Synthesis/SynthesesNCHRPCurrent.asp

NATIONAL COOPERATIVE FREIGHT RESEARCH PROGRAM

NCFRP projects: www.trb.org/CPR/NCFPR/NCFRPPProjects.asp

HAZARDOUS MATERIALS COOPERATIVE RESEARCH PROGRAM

HMCRP projects: www.trb.org/CPR/HMCPR/HMCRPPProjects.asp