



NATIONAL COOPERATIVE FREIGHT RESEARCH PROGRAM

Current and Completed Projects

Winter 2013–2014

For more information,
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The National Cooperative Freight Research Program

Authorized in 2005 under the legislation Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the National Cooperative Freight Research Program (NCFRP) is sponsored by the Research and Innovative Technology Administration (RITA) and managed by the Transportation Research Board (TRB), with program guidance provided by an oversight committee comprising a representative cross section of freight stakeholders. Annual funding had been averaging around \$3.4 million per year. However, the Moving Ahead for Progress in the 21st Century Act (MAP-21) repealed the NCFRP. Although there will be no new funding, all existing research contracts will be completed as planned within the next 30-month period. The Freight Research Oversight Committee, along with staff from RITA and TRB, will be discussing additional closeout activities that may be possible to summarize and conclude the program.

Current and Completed Projects

Winter 2013–2014

NCFRP-01. *Review and Analysis of Freight Transportation Markets and Relationships*

Objective: Develop a freight primer that offers public-sector decision makers a deeper understanding of the importance of freight, the factors that drive private freight decisions, and the interaction of public policy with the public- and private-sector decision-making processes. The primer will provide guidance and a discussion framework for public-sector decision makers so that they have an improved understanding of how public policies influence freight transportation markets and private freight decisions. The research will focus on current and future demand for freight transportation (in the context of global and national economic trends and advanced business logistics practices) and should serve as a foundation for future research.

Research Agency: Global Insight
Contract Amount: \$250,000
Status: Complete; published as NCFRP Report 1

NCFRP-02. *Impacts of Public Policy on the Freight Transportation System*

Objective: Identify intended and unintended impacts (either direct or indirect) of a broad array of public policies on the freight system, promoting a better understanding of these complex relationships and fostering appreciation for how public policies affect the freight transportation system.

Research Agency: ICF
Contract Amount: \$390,000
Status: Complete; published as NCFRP Report 6 (revised)

NCFRP-03. *Performance Measures for Freight Transportation*

Objective: Identify measures to gauge the performance of the freight transportation system. The measures should support investment, operations, and policy decisions by a range of stakeholders, both public and private, and reflect local, regional, national, and global perspectives. Areas of emphasis should include, but not be limited to, efficiency, effectiveness, capacity, safety, security, infrastructure condition, congestion, energy, and environment.

Research Agency: Gordon Proctor and Associates
Contract Amount: \$300,000
Status: Complete; published as NCFRP Report 10

Winter 2013–2014



NCFRP-04. Operational and Low-Cost Improvements to Freight Transportation System Performance

Objectives:

- Develop a more standardized description of the dimensions of the freight system (e.g., elements of each mode and across modes, stakeholders, and types of mobility constraints) that will help improve communication among freight-system decision makers and stakeholders and facilitate examination of freight-system mobility constraints and the operational practices or system enhancements used to address these constraints;
- Analyze explicitly the business practices and institutional factors that influence freight-system decision makers and stakeholders as they respond to freight-system mobility constraints and regulatory and other public policy initiatives;
- Develop a methodology that private- and public-sector decision makers can use to identify, categorize, and evaluate quickly implementable and low-cost capital, operational, and public policy actions that can enhance freight mobility by addressing system constraints; and
- Apply that methodology in a generic way to create a catalog of actions that may be most useful in addressing the nation's freight-system mobility constraints.

Research Agency: Battelle

Contract Amount: \$750,000

Status: Complete; published as NCFRP Report 7

NCFRP-05. Framework and Tools for Estimating Benefits of Specific Freight Network Investment Needs

Objective: Develop a comprehensive analytical framework and related tools for estimating public and private benefits to evaluate potential freight infrastructure investments (including investments in new, replacement, maintenance, and operational systems), as well as potential funding sources. The framework should be based on a multidimensional matrix and related tools that can be used to guide the allocation of project costs among (a) private-sector freight transportation modes and shippers and (b) public-sector transportation interests such as metropolitan planning organizations (MPOs), states, multistate, and freight transportation corridors.

Research Agency: Cambridge Systematics

Contract Amount: \$500,000

Status: Complete; published as NCFRP Report 12

NCFRP-06. Freight-Demand Modeling to Support Public-Sector Decision Making

Objectives:

- Investigate, identify, and report on high-priority, high-payoff improvements in freight-demand models and other analysis tools; and
- Develop a guidebook to assist model developers in implementing these improvements.

This project will select one or more of the highest-priority, high-payoff recommendations and develop a comprehensive process to implement the improvements. The recommendations included in the guidebook ultimately will improve the usability of freight-demand models and other analysis tools for public-sector decision makers at a range of geographical levels. The guidebook will relate freight-demand models and other analysis tools to planning; engineering; construction; and use of infrastructure, finance, environmental mitigation, systems operation, and economic impact.

Research Agency: Cambridge Systematics

Contract Amount: \$500,000

Status: Complete; published as NCFRP Report 8



NCFRP-09. Institutional Arrangements in the Freight Transportation System

Objective: Describe successful and promising institutional arrangements for improving freight movement, now and in the future.

Research Agency: Cambridge Systematics

Contract Amount: \$270,000

Status: Complete; published as NCFRP Report 2

NCFRP-11. Current and Future Contributions to Freight Demand in North America

Objective: Describe and analyze important demographic, economic, environmental, and other factors that may contribute to the future quantity; geographic distribution; temporal distribution of tons, ton miles, vehicle miles, or train miles; and the value of freight to be moved in and through North America.

The research will

- Identify the factors and estimate the direction and relative magnitude of the influence of each factor on freight demand;
- Identify whether the effects are international, national, regional, or local;
- Assess whether the factor and its effects on demand will continue in the near- and long-term; and
- Identify factors that should be monitored to detect major changes in trends in the demand for freight transportation, including supply interactions.

Research Agency: Halcrow

Contract Amount: \$375,000

Status: Complete; published as NCFRP Web-Only Document 4

NCFRP-12. Specifications for Freight Transportation Data Architecture

Objectives:

- Develop the specifications for the content and structure of freight data architecture;
- Identify the value and challenges of the potential architecture; and
- Specify institutional strategies to develop and maintain the architecture.

Research Agency: Texas A&M Transportation Institute

Contract Amount: \$300,000

Status: Complete; published as NCFRP Report 9

NCFRP-14. Truck Drayage Practices

Objective: Develop a guidebook that will identify potential metrics for measuring drayage productivity and improvements that can be made by stakeholders to increase throughput, reduce air pollution, improve freight mobility, and increase truck driver productivity at marine container terminals nationwide.

Research Agency: Tioga Group

Contract Amount: \$390,000

Status: Complete; published as NCFRP Report 11

NCFRP-15A. Understanding Urban Goods Movements

Objective: Develop a guidebook that will improve public decisions affecting urban commercial motor vehicle movements for goods delivery. The guidebook will include a detailed background discussion of urban goods movement and teaching case studies. The guidebook and case studies will help decision makers understand the potential impacts of their decisions on urban goods movements among the



following categories: transportation infrastructure and operations; land use and site design; and laws, regulations, and ordinances applicable to urban areas.

Research Agency: Wilbur Smith Associates
Contract Amount: \$500,000
Status: Complete; published as NCFRP Report 14

NCFRP-16. *Representing Freight in Air Quality and Greenhouse Gas Models*

Objective: Evaluate the current methods used to generate air emissions information from freight transportation activities and determine their suitability for purposes such as (a) health and climate risk assessments, (b) prioritization of emission reduction activities such as through state implementation plans (SIPs), and (c) public education.

Research Agency: ICF
Contract Amount: \$200,000
Status: Complete; published as NCFRP Report 4

NCFRP-17. *North American Marine Highway Operations*

Objective: Produce a white paper that evaluates the potential for moving intermodal containers, containers on chassis, noncontainerized trailers, or rail cars on marine highways in North America. The research will assess the conditions for feasibility, identify barriers (e.g., economic, technical, regulatory, and logistical), and propose solutions for barrier elimination.

Research Agency: Texas A&M Transportation Institute
Contract Amount: \$100,000
Status: Complete; published as NCFRP Report 5

NCFRP-17(01). *Marine Highway Transportation of Toxic Inhalation Hazard (TIH) Materials*

Objective: Examine the benefits of transporting a larger share of chlorine and anhydrous ammonia via the marine highway system.

Research Agency: Texas A&M Transportation Institute
Contract Amount: \$200,000
Status: Complete; published as NCFRP Report 18

NCFRP-18. *Synthesis of International Freight Scans*

Objectives:

- Consolidate and summarize findings from reports on the three following international scans on freight transport, with particular emphasis on the recommendations for changes in practices in the United States:
 - Freight Transportation: The European Market—2002;
 - Freight Transportation: The Latin American Market—2003; and
 - Freight Mobility and Intermodal Connectivity in China—2007
- Recommend new research areas to inform the NCFRP Oversight Committee.

Research Agency: F. Gerald Rawling
Contract Amount: \$20,000
Status: Complete; available by request



NCFRP-19. *Truck Tolling: Understanding Trade-offs When Using or Avoiding Toll Facilities*

Objective: Identify the value that goods movement businesses seek from the transportation system and their willingness to pay for that value. The proposed research looks across the spectrum of freight markets and their subsectors to address questions of who pays the tolls, how the tolls relate to other operating costs, whether these costs can be passed on to the customer, and who makes routing decisions. It is intended to be expansive with regard to freight markets, exploring not only those that move the goods, but the shipping community as well. This project is jointly funded by the National Cooperative Highway Research Program (NCHRP).

Research Agency: Parsons Brinckerhoff

Contract Amount: \$300,000

Status: Complete; published as NCFRP Web-Only Document 3

NCFRP-20. *Guidebook for Developing Subnational Commodity Flow Data*

Objective: Provide state departments of transportation (DOTs) and MPOs with guidance for compiling commodity flow data sets appropriate for subnational analysis. This will include techniques for disaggregating national data sets; procedures, and methodologies for conducting local commodity flow surveys; a compendium of commonly available public and private data sources for use in constructing subnational commodity flow data sets; and procedures for compiling local, state, or regional commodity flow databases from these various resources.

Research Agency: Cambridge Systematics

Contract Amount: \$500,000

Status: Complete; published as NCFRP Report 26

NCFRP-22. *Applying Benefit–Cost Analysis to Freight Project Selection: Lessons from the Corps of Engineers*

Objective: Summarize past studies and testimonies on the effectiveness of benefit–cost analysis at the U.S. Army Corps of Engineers; supplemented by interviews with past and present Corps officials and stakeholders.

Research Agency: Acadia Group

Contract Amount: \$50,000

Status: Complete; available at http://onlinepubs.trb.org/onlinepubs/nctfp/docs/NCFRP22_FR.pdf

NCFRP-23. *Economic and Transportation Drivers for Siting Freight Intermodal and Warehouse Distribution Facilities*

Objective: Provide public-sector practitioners in both the transportation and economic development fields with an understanding of key transportation and economic-related factors and strategies that must be considered when building intermodal terminals and warehouse distribution facilities.

Research Agency: CWS Consulting

Contract Amount: \$250,000

Status: Complete; published as NCFRP Report 13

NCFRP-24. *Preserving and Protecting Freight Infrastructure and Routes*

Objective: Provide state and local officials, land use planners, transportation consultants, architects and developers with a state-of-the-practice review of current activities in this area. It will provide information on best practices, innovative zoning or other ordinances currently used, mitigation options, as well as a guidebook that the previously noted groups can use as they plan and develop facilities in proximity to freight, port, and rail operations.



Research Agency: Christensen Associates
Contract Amount: \$500,000
Status: Complete; published as NCFRP Report 16

NCFRP-25. Freight Trip Generation and Land Use

Objective: Estimate the amount of freight activity generated or attracted by different types of land use for state and local planning studies. The research would extend truck trip generation estimates and guidebooks developed by the Institute of Transportation Engineers and the Truck Trip Generation Guide in NCHRP Synthesis 20-05/Topic 31-09. This project is jointly funded by NCHRP.

Research Agency: Rensselaer Polytechnic Institute
Contract Amount: \$250,000
Status: Complete; published as NCFRP Report 19/NCHRP Report 739

NCFRP-25(01). Estimating Freight Generation Using Commodity Flow Survey Microdata

Objective: Estimate freight generation models using the Commodity Flow Survey microdata as a function of establishment characteristics at different levels of geography.

Research Agency: Rensselaer Polytechnic Institute
Contract Amount: \$300,000
Status: Under way; completion date February 2014

NCFRP-26. Freight Transportation Cost Data Elements

Objective: Identify specific types of transportation cost data required by national, state, and local transportation and economic development agencies; assess different strategies for collecting those types of cost data; and propose a strategy for obtaining the needed data.

Research Agency: Rensselaer Polytechnic Institute
Contract Amount: \$300,000
Status: Complete; published as NCFRP Report 22

NCFRP-27. Promoting Environmental Goals in Freight Transportation through Industry Benchmarking

Objectives:

- Identify and evaluate methods currently used to estimate, monitor, and regulate freight emissions (building upon the work in NCFRP-16); and
- Examine benchmarking in the freight industry to promote environmental goals, opportunities to use benchmarking in the freight emissions context, and the possible benefits of benchmarking by mode for air quality impacts around major freight hubs.

Research Agency: ICF
Contract Amount: \$300,000
Status: Complete; published as NCFRP Report 21

NCFRP-28. Truck Idling Scoping Study

Objective: Develop the scope, methods, and cost estimates for obtaining national and regional estimates of the time spent idling by trucks, categorized by type of truck and activity served.

Research Agency: Booz Allen Hamilton
Contract Amount: \$200,000
Status: Complete; available at http://onlinepubs.trb.org/onlinepubs/ncfrp/docs/NCFRP28_FR.pdf



NCFRP-29. *New Dedicated Revenue Mechanisms for Freight Transportation Investment*

Objective: Analyze the functioning and implications of 11 proposed revenue mechanisms and describe in detail the requirements and mechanics to set up and operate each of them. The proposed revenue mechanisms are (1) customs revenues for freight transportation purposes, (2) container fees, (3) bill of lading fees, (4) weight-based tax, (5) weight–distance tax, (6) freight transportation value tax, (7) annual highway user vehicle tax, (8) annual highway miles traveled fee, (9) sales tax on motor vehicles, (10) national vehicle safety inspection tag, and (11) carbon tax or cap-and-trade proceeds.

Research Agency: Tioga Group

Contract Amount: \$500,000

Status: Complete; published as NCFRP Report 15

NCFRP-30. *Web-Based Screening Tool for Shared-Use Rail Corridors*

Objective: Provide funding to revise any existing railroad simulation software as a web-based, freely accessible tool able to estimate the incremental and service costs associated with adding or improving passenger rail service on freight rail lines.

Research Agency: Decision Tek

Contract Amount: \$500,000

Status: Complete; in publication

NCFRP-31. *Guidebook for Sharing Freight Transportation Data*

Objective: Provide a general framework for agreements for public–private sharing of freight data to support planning and management decisions. The products will include samples and case studies of successful public–private freight data sharing arrangements, with identification and analysis of the safeguards included to protect all stakeholders and model data sharing agreements.

Research Agency: Cambridge Systematics

Contract Amount: \$250,000

Status: Complete; published as NCFRP Report 25

NCFRP-32. *Impact of Smart Growth on Metropolitan Goods Movement*

Objectives:

- To improve the means by which planning agencies can measure the performance of (freight) transportation systems; and
- To use these improved measures to model (freight) transport systems more accurately.

Research Agency: Puget Sound Regional Council

Contract Amount: \$250,000

Status: Complete; published as NCFRP Report 24

NCFRP-33. *Impact of Environmental Regulations on the Supply Chain*

Objective: To better understand the economic drivers and competition considerations of supply chain businesses with respect to current and future air quality and greenhouse gas emission regulations.

Research Agency: Halcrow

Contract Amount: \$400,000

Status: Complete; in publication



NCFRP-34. *Alternative Technologies for Container Freight Movements*

Objective: Conduct an industry review of alternative technology to move ocean containers or truck trailers, including those such as magnetic levitation, the Texas A&M Transportation Institute's Universal Freight Shuttle, and concepts still on the drawing board. The anticipated outcome would be an effective methodology to provide an unbiased evaluation of current and future technologies using proven benefit-cost analysis techniques.

Research Agency: Tioga

Contract Amount: \$300,000

Status: Under way; completion date February 2014

NCFRP-35. *The Great Lakes Region Impacts on the Intermodal Freight System*

Objective: Describe the current state of freight transportation in the Great Lakes region, the impediments that lead to inefficiencies, and practical steps that could raise intermodal freight performance in the region.

Research Agency: CPCS

Contract Amount: \$300,000

Status: Complete; published as NCFRP Report 17

NCFRP-36. *Quick Response Projects*

36(01). *National Multi-Modal Freight Transportation Strategy*

Research Agency: Peter Swan

Contract Amount: \$40,000

Status: Complete; available by request

36(02). *Harbor Maintenance Tax Impacts on Freight*

Status: Task added to **NCFRP-35**

36(03). *Multistate Corridor Organizations*

Research Agency: Cambridge Systematics

Contract Amount: \$50,000

Status: Complete; published as NCFRP Web-Only Document 2

36(04). *Carbon Footprint of Supply Chains: A Scoping Study*

Research Agency: MIT

Contract Amount: \$100,000

Status: Complete; published as NCFRP Web-Only Document 5

36(05). *Synthesis of Freight Research on Urban Transportation Planning*

Research Agency: USC

Contract Amount: \$50,000

Status: Complete; published as NCFRP Report 23

NCFRP-37. *Making U.S. Ports Resilient as Part of Extended Intermodal Supply Chains*

Objective: Develop a set of high-level guidelines that will help seaport authorities as well as state DOTs where such ports are located to minimize lost throughput capacity caused by a major disruption.

Research Agency: Georgia Tech

Contract Amount: \$200,000

Status: Under way; completion date April 2014



NCFRP-38. *Improving Freight System Performance in Metropolitan Areas*

Objective: Develop a regional public planning guide that identifies potential strategies and practical solutions for public and private stakeholders to improve freight movement system performance in metropolitan areas.

Research Agency: Rensselaer Polytechnic Institute

Contract Amount: \$450,000

Status: Under way; completion date May 2014

NCFRP-39. *Making Trucks Count: Innovative Strategies for Obtaining Comprehensive Truck Activity*

Objective: Develop and assess strategies to obtain comprehensive trucking activity data for making more informed public policy decisions at the national and regional levels.

Research Agency: RAND

Contract Amount: \$300,000

Status: Complete; draft final report received October 2013

NCFRP-40. *Improving Export Freight Logistics*

Objective: Identify the domestic impediments that currently restrict U.S. export supply chains and identify options for improving export freight logistics without degrading existing import supply chains.

Research Agency: CDM Smith

Contract Amount: \$300,000

Status: Under way; completion date July 2014

NCFRP-41. *Incorporating Truck Analysis into the Highway Capacity Manual*

Objective: Develop improved, nationally accepted capacity and level-of-service techniques suitable for incorporation into the Highway Capacity Manual to improve transportation agencies' abilities to plan, design, manage, and operate streets and highways to serve trucks.

Research Agency: Dowling & Associates

Contract Amount: \$500,000

Status: Under way; completion date April 2014

NCFRP-42. *Integrating MTS Commerce Data with Multimodal Freight Transportation Performance Measures*

Objective: Develop methodologies linking the performance of the marine transportation system (MTS) with the performance of the freight transportation system that can be used to identify MTS maintenance investment strategies to improve the efficiency of the overall freight transportation system.

Research Agency: Texas A&M Transportation Institute

Contract Amount: \$300,000

Status: Under way; completion date April 2014

NCFRP-43. *Guidebook for Assessing Evolving International Container Chassis Supply Models*

Objective: Develop a guidebook for beneficial cargo owners, public officials, and other transportation stakeholders that describes the historical and evolving models of international container chassis ownership and management, and the factors unique to each, to inform stakeholder decision making for the efficient and cost-effective movement of containerized freight, both import and export, in the United States.



Research Agency: CPCS
Contract Amount: \$300,000
Status: Complete; published as NCFRP Report 20

NCFRP-44. *Impacts of Policy-Induced Freight Modal Shifts*

Objective: Develop a handbook for public practitioners that describes factors considered by shippers and carriers when choosing freight modes and that provides an analytical methodology to quantify the probability and outcomes of policy-induced modal shifts.

Research Agency: Rensselaer Polytechnic Institute
Contract Amount: \$350,000
Status: Under way; completion date April 2015

NCFRP-45. *Enhancing Sleep Efficiency on Towboats in the U.S. Inland Waterway Industry*

Objective: Develop a compendium of best practices for enhancing sleep efficiency on towboats in the U.S. inland waterway industry.

Research Agency: Northwestern University
Contract Amount: \$300,000
Status: Under way; completion date April 2015

NCFRP-46. *Benefit–Cost Methodologies for Evaluating Multimodal Freight Corridor Investments*

Objective: Develop a guidebook for practitioners for conducting benefit–cost analyses of proposed infrastructure investments on multimodal, multijurisdictional freight corridors to inform public and private decision makers and other stakeholders at local, state, regional, and national levels.

Research Agency: Texas A&M Transportation Institute
Contract Amount: \$450,000
Status: Under way; completion date July 2015

NCFRP-47. *Freight Transportation Data Architecture: Data Element Dictionary*

Objective: Produce a searchable and sustainable web-based freight data element dictionary for transportation analysis, to be hosted at U.S. DOT's Bureau of Transportation Statistics.

Research Agency: University of Texas
Contract Amount: \$500,000
Status: Under way; completion date March 2015

NCFRP-48. *Freight Research to Support MAP-21 Implementation*

Objectives:

- Produce a searchable and sustainable web-based tool, to be hosted by U.S. DOT, that identifies how the findings and conclusions of NCFRP products can be used as input to the successful implementation of the freight provisions of MAP-21;
- Demonstrate the potential application of NCFRP products for MAP-21 implementation and other freight planning and programming applications; and
- Identify future freight research needs that would support the development of a national freight strategy.

Research Agency: ICF
Contract Amount: \$500,000
Status: In contracting



