



CFIRE

University Transportation Centers: Integrating Efforts

Workshop held on October 20, 2009

Introduction

On October 20, 2009, the Center for Freight & Infrastructure Research & Education (CFIRE) hosted Freight Research at University Transportation Centers: Integrating Efforts, a one-day workshop that focused on defining more productive and efficient ways of collaborating on freight research at University Transportation Centers (UTCs). This national workshop and forum, held in Long Beach, California in conjunction with the Metropolitan Transportation Center's (METTRANS) National Urban Freight Conference, brought together national leaders from the freight transportation community and educational institutions to explore opportunities for collaborative research in freight, to identify colleagues and contacts for continued cooperation, to define existing barriers and challenges for freight research and information dissemination, and to explore the institutional arrangements needed to meet the research and training needs of the future. Eighteen UTCs, as well as multiple state and local agencies sent representatives to the workshop.

Facilitated working groups focused on four broad research areas that served as the centerpiece of the workshop:

1. Freight economics
2. Freight planning, logistics, and supply chain
3. Environment and emissions
4. Infrastructure and materials.

The workshop also included research updates from several UTCs and a successful speed-networking event, which provided each attendee with a half-dozen new connections.

The purpose of this document is to summarize the events of the day and outline the foundation for a national dialogue on freight research topics and for creating a system for UTCs to collaborate more effectively on freight research. The workshop agenda focused heavily on familiarizing attendees with current freight research efforts, networking, and most importantly, a working session to identify areas for collaboration and improvement.

Background

The US Department of Transportation (US DOT) has recently called for better coordination of research efforts among the 60 university transportation centers. This workshop answered that call. Building upon a similar event held in October of 2007 entitled “Research Issues in Freight Transportation: Congestion and System Performance”, this workshop provided attendees with an opportunity to build professional networks, to gain a greater understanding of critical freight research issues, and to further their knowledge of research efforts at other UTCs and state and local agencies. Figure 1 shows the geographic distribution of UTCs, which currently span more than 40 states and involve 125 universities.

UTCs by Location

There are UTCs in more than 40 states involving 125 universities (Figure 2).

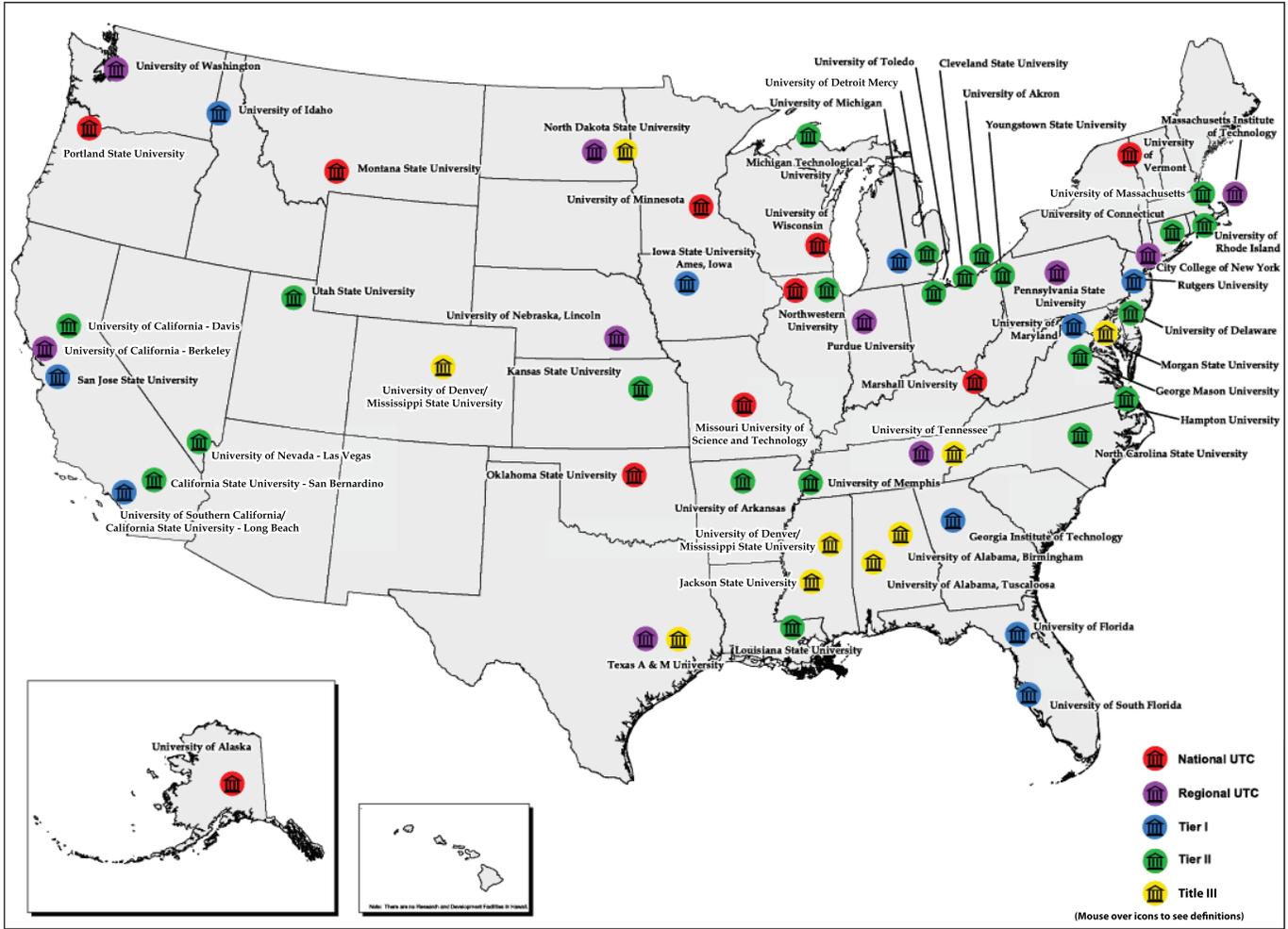


Figure 1: Map of UTCs

UTCs by Funding Level

Figure 2 lists UTCs by funding level. Representatives from National UTCs, as well as Regional, Tier I, Tier II, and Tier III were all in attendance (in bold) at the workshop. UTCs marked with an asterisk have research themes that are directly related to freight transportation.

<p>National UTCs (\$2-3.5 million/year)</p> <ul style="list-style-type: none">• Marshall University• Missouri University of Science & Technology• Montana State University• Northwestern University• Oklahoma State University• Portland State University• University of Alaska• University of Minnesota• University of Vermont• University of Wisconsin* <p>Regional UTCs (\$1-2.25 million/year)</p> <ul style="list-style-type: none">• I–Massachusetts Institute of Technology• II–City College of City University of New York• III–Pennsylvania State University• IV–University of Tennessee• V–Purdue University*• VI–Texas A & M University• VII–University of Nebraska• VIII–North Dakota State University*• IX–University of California, Berkeley• X–University of Washington <p>Tier I UTCs (\$1 million/year)</p> <ul style="list-style-type: none">• Georgia Institute of Technology• Iowa State University• Rutgers University*• San Jose State University• University of Florida• University of Idaho• University of Maryland, College Park• University of Michigan• University of South Florida• University of Southern California and California State, Long Beach*	<p>Tier II UTCs (\$500,000/year)</p> <ul style="list-style-type: none">• California State, San Bernadino• Cleveland State University• George Mason University• Hampton University• Kansas State University• Louisiana State University• Michigan Technological University• North Carolina State University• Northwestern University• University of Akron• University of Arkansas• University of California, Davis• University of Connecticut• University of Delaware, Newark• University of Detroit Mercy• University of Massachusetts, Amherst• University of Memphis*• University of Nevada, Las Vegas• University of Rhode Island• University of Toledo*• Utah State University• Youngstown State University <p>Tier III UTCs (funding amount varies)</p> <ul style="list-style-type: none">• Jackson State University• Morgan State University• North Dakota State University–Small Urban & Rural Transit Center• Texas A & M University–Texas Transportation Institute• University of Alabama, Birmingham• University of Alabama, Tuscaloosa• University of Denver/Mississippi State University*• University of Tennessee, Knoxville• National Transportation Research Center*
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Figure 2: UTCs by Funding Level

The workshop entitled “Research Issues in Freight Transportation: Congestion and System Performance”, was held in Washington, D.C. in October of 2007. Major themes for the event included:

- Context factors (understanding supply chain costs and impacts of those costs, environmental sustainability issues related to freight/freight and the natural environment).
- Decision-making environment (clearly communicating the benefits of freight system improvements, identifying external factors with regard to freight transport decisions, and incorporating performance management into the decision-making process).

- Analysis methods (importance and availability of quality data, providing freight analysis results that directly relate to planning decisions, and realizing that there are a number of various tools and models that relate to the types of decisions being made); and
- Institutional issues (the role of public investments in benefitting freight movements, funding strategies, successful public-private partnerships).

The resulting Priority Research Agenda focused on the following themes:

- Broad relationships between economic factors and freight transportation demand
- Environmental sustainability and the strategies the freight sector can apply to become more environmentally neutral
- Freight planning and analysis frameworks
- Technology applications
- Institutional structures and issues
- Workforce issues

Issues that were not directly addressed in the 2007 workshop included data, security, infrastructure & efficiency, and safety.

Goals and Objectives

Genevieve Giuliano of METRANS provided a welcome address for the workshop participants and summarized current research at METRANS which includes: Reducing impacts of freight (congestion, air pollution), Increasing productivity (port operations, freight routing and optimization), Modeling/simulation (at the port and intra-urban level as well as economic impact models), and identifying Risks and impacts of disruptions in the freight system.

METRANS' proximity to the Port of Los Angeles/Long Beach lends plenty of opportunity to address some of the most pressing freight issues in the US today. Giuliano listed a number of relevant 2009-2010 projects, including: "Moving containers efficiently with less impact" (#10-06), "Dynamic scheduling of trains in densely populated, congested areas" (#10-08), "Workflow synthesis and management for integrated traffic simulation" (#10-16), and "The impact of truck repositioning on congestion and pollution in the LA Basin" (10-26). METRANS is also conducting a "Testbed Initiative," a simulation of the Los Angeles/Long Beach ports and surrounding area that links multiple different models—dock operations, truck routing, traffic micro-simulation, etc—in order to more accurately estimate movements as opposed to relying on outputs of individual models.

Jason Bittner of CFIRE then provided an overview of workshop goals and context for the purpose of the workshop. Mr. Bittner described current themes for freight research as Focus, defining parameters for the research community; Accountability, given that the majority of research is publicly funded; Research collaboration and coordination, eliminating duplication among UTCs; and lastly striving for organizational excellence.

Mr. Bittner then highlighted the primary purposes of the workshop, which were to:

- Explore opportunities for collaborative research in freight
- Identify colleagues and contacts for continued cooperation
- Define existing barriers and challenges for freight research and information dissemination
- Explore institutional arrangements that will be needed to meet the research and training needs of the future

Larry Rilett (University of Nebraska), Chen-Fu Liao (University of Minnesota), Tom O'brien (METRANS), Martin Lipinski (University of Memphis), Richard Stewart (University of Wisconsin – Superior) and Jason Bittner (University of Wisconsin) each provided updates of freight research and activities their respective UTC was involved in. The updates provided a glimpse into the wide variety of ongoing freight research as well as to set the stage for the rest of the day's discussions.

The updates also familiarized attendees with the broad range of activities within the field of freight transportation research, including unique research topics, various funding sources, and the different forms that collaborations take within UTCs.

- Larry Rilett, whose Mid-America Transportation Center focuses heavily on operational and structural safety as freight shipments increase, highlighted a handful of the Center's 51 sponsored projects in progress.
- Chen-Fu Liao spoke about the Intelligent Transportation Systems Institute at the University of Minnesota, which uses a multi-disciplinary approach to research human-centered technology to enhance safety and mobility. The Institute

runs three major programs, the Intelligent Vehicles Laboratory, Minnesota Traffic Observatory, and the HumanFIRST Program.

- Tom O'Brien expanded upon comments given earlier by Genevieve Giuliano and described current work at METRANS, which is focused around four thematic areas: goods movement and international trade, urban mobility, infrastructure, and safety and security.
- Martin Lipinski spoke about the work of the Intermodal Freight Transportation Institute at the University of Memphis. The Institute is comprised of both the Center for Intermodal Freight Transportation Studies (CIFTS) UTC, and the Center for Advanced Intermodal Technologies (CAIT). Their goal is to provide solutions to intermodal transportation systems problems through research, education, and technology transfer.
- Richard Stewart outlined the activities of the Great Lakes Maritime Research Institute (GLMRI), one of eight designated National Maritime Enhancement Institutes, and their goals in improving freight flows on the Great Lakes system.
- Jason Bittner outlined the many projects currently underway at CFIRE, which are centered around four Signature Technical Areas of Research (STARs): Design, Materials, and Construction Processes for Highway, Harbor, and Rail Infrastructure; Multimodal Systems Planning and Optimization; Traffic Operations and Safety; and Energy and Environment.

For more information about the current work of these University Transportation Centers, visit their respective websites:

- Mid-America Transportation Center (matc.unl.edu)
- Intelligent Transportation Systems Institute (its.umn.edu)
- METRANS (metrans.org)
- Intermodal Freight Transportation Institute (memphis.edu/ifti/)
- Great Lakes Maritime Research Institute (glmri.org)
- National Center for Freight and Infrastructure Research and Education (cfire.wistrans.org)

Download the UTC update presentations at cfire.wistrans.org/IntegratingEfforts/

Workshop Agenda

Workshop Agenda	
<p>8:30-9:30 (Cival/Tikal Room) Welcome - Genevieve Giuliano, METRANS Overview of Workshop Goals - Jason Bittner, CFIRE</p>	<p>12:00-1:00 Lunch (Jardin de Palmeras)</p>
<p>9:30-10:30 (Cival/Tikal Room) UTC Freight Research Updates</p> <p>Larry Rilett, University of Nebraska Chen-Fu Liao, University of Minnesota Tom O'Brien, METRANS Marty Lipinski, University of Memphis Richard Stewart, University of Wisconsin-Superior National Freight Center Overview - Jason Bittner, CFIRE</p>	<p>1:00-4:00 Facilitated Working Groups (2:30-2:45 Break with Optional Rotation)</p> <p>Freight Economics (Luna/Solstice Room) Facilitator: Teresa Adams, CFIRE Freight Planning, Logistics, & Supply Chain (Quetzal Room) Facilitator: Joe Petrolino, NTRCI Environment & Emissions Copan Room Facilitator: Larry Rilett, NTC Infrastructure & Materials Zama Room Facilitator: Marty Lipinski, CIFTS</p>
<p>10:30-10:45 Break</p>	<p>4:00-5:00 (Cival/Tikal Room) Reconvene to Discuss Working Group Efforts</p>
<p>10:45-12:00 Speed Networking (Miramar Room)</p>	<p>5:00-5:15 Closing Comments (Cival/Tikal Room)</p>

Figure 3: Workshop Agenda

The workshop included a unique networking event to further encourage collaboration between participants. The format was to pair attendees together for a series of 2-3 minute ‘speed’ networking conversations to briefly familiarize one another with things such as background, experience, and current projects. The event afforded an opportunity to acquaint a number of researchers and practitioners with one another and was received very well by all who participated.

Facilitated working groups focused on four topic areas: freight economics; freight planning, logistics, and supply chain; environment and emissions; and infrastructure and materials. Each group’s facilitator was asked to guide the discussion by posing several pre-determined questions:

- What are the current research needs in your area?
- What are obstacles to current research (data, funding, match, access, etc)?
- What are opportunities for collaborations?
- Identify strategies to encourage collaboration and overcome obstacles (social networking tools, key professional associations, journals, etc.).
- Why is it difficult to conduct research in your home state (historical obstacles)?
- What are the biggest barriers to freight efficiency?

Research Needs

Freight Economics

The Freight Economics Group listed multiple research needs at the macroeconomic and microeconomic scale. Broadly, the group discussed issues that arise with accurately calculating and predicting economic impacts of freight-specific investments and improvements. Specific needs included: determining how transport infrastructure impacts economic development and how to measure impacts; exploring the public/private role in freight; promoting new private investment, particularly in maritime infrastructure and long-term investment, such as for rail, truck, intermodal facilities.

Additional specific economic issues mentioned were:

- Improving US/Mexico transport links, security of the border crossing, mobility, and trade.
- Rehabilitation of border communities.
- Trans-Texas corridor—public, private partnership and related issues.
- Rectifying localized decisions and conditions with nationwide statistics and issues.
- Global gateways, economic benefits, and local property impacts.
- Freight infrastructure, scale of economic development, and how to value infrastructure—methods to obtain reliable data.
- Highway financing strategies (tolling and congestion pricing).
- Identifying ways to integrate transport and economic data from multiple sources.
- Price elasticities and the need separate calculations for different modes and commodities. Different inputs to trade have different elasticities.
- Explore existing pricing mechanisms to compare impacts of other implementations.

(See Appendix I for a summary of research needs.)

Freight Planning, Logistics, and Supply Chain

The Freight Planning, Logistics, and Supply Chain Group suggested a number of research needs, primarily focusing on how to better approach freight issues from a multi-jurisdictional perspective, acquiring and maintaining quality data, and accurately measuring economic and environmental impacts of freight. Specifically, the group suggested further exploration into the relationship between national, regional, state, and local issues, and how planning at different levels of government agencies impacts businesses. They noted that one potential approach is to establish a national strategy and oversight for freight transportation—a federal guidance/strategy agency devoted to freight similar to organizations such as the Federal Railroad Administration (FRA).

Additional suggestions included:

- Further research into freight as it pertains to economic viability, stability, and competition
- More detailed research of freight-specific environmental impacts,
- Continued exploration of technology applications for freight and logistics.

(See Appendix I for a summary of research needs.)

Environment and Emissions

The Environment and Emissions Group listed numerous areas of potential research, particularly in regard to improving modeling and model development. Specific areas of focus include devising better models of supply and demand, refining port operation models, and alternative fuels research:

- Creating better models of supply and demand.
- Determining why mode and route decisions made the way they are.
- Incorporating traffic to environmental models on a disaggregate level, street level, and individual vehicle modeling.
- Utilizing equilibrium modeling.
- Comprehensive models of port operations.
- Move from state of the art to state of practice.

- Individual vehicle modeling.
- Alternative fuels research.
- Integrating alternative fuel needs with operational efficiencies.
- Planning for biomass facilities and determining the freight/storage needs.
- Lifecycle costs between different fuel options.
- Calculating health, environment, water, quality of life issues.

In addition to these points the group thought that general recommendations for modeling could also address incorporating social data with technical models and identifying localized health impacts of emissions. Another suggested topic is the human impacts of freight. For instance, calculating the impacts on humans as a result of the movement/routing of hazardous goods along with affects from freight related noise.

(See Appendix I for a summary of research needs)

Infrastructure and Materials

The Infrastructure and Materials Group discussed multiple broad research needs that echoed those mentioned by other groups, including improved communication, identifying better data sources, and improving public-private relationships regarding freight transportation. Specific needs suggested were:

- Improving communication between freight stakeholders and the public sector.
- Maintaining current data (up-to-date, accurate, suitable for forecasting, and accessible).
- Research surrounding high speed rail network infrastructure development and material usage.
- Researching impacts of larger envelope truck designs. Determining whether current infrastructure able to support larger/higher productivity vehicles, and alternative axle configurations.

The group also discussed the concept of Positive Infrastructure, using infrastructure investment to spur economic growth, increase freight efficiency, and improve resource utilization. Potential research in this regard could include infrastructure and materials impacts in the context of:

- Analysis of economic base and job creation
- Impact on the pricing of goods
- Evaluation of environmentally friendly technology
- Analyzing best practices for efficient and effective infrastructure resource allocation

(See Appendix I for a summary of research needs.)

Research Obstacles

Despite the differences in freight disciplines and backgrounds, each group lamented data issues as a challenge. Access and ability to acquire data, quality of data, consistency of data, and maintaining accurate data were all common themes. In addition, insufficient communication among the freight community and lack of steady funding sources were noted as obstacles.

In terms of data issues, key points made by the Freight Economics Group were that rail provides one of the only sources of uniform and reliable data in the form of its annual waybill sample. Issues of obtaining and using proprietary data, including privacy considerations and sharing limitations are an ongoing challenge.

Additional concerns include:

- Finding good international and US import/export data.
- Accommodating unclear US DOT rules for economic development as justification.
- Different data organization methods. No uniform standards or oversight agency for data.
- Data quality gaps. Do we trust models that use questionable data for calibration? If the foundation of the model is suspect, then the entire model is suspect.

The Freight Planning, Logistics, and Supply Chain Group listed the availability and accuracy of data as obstacles, but also suggested that resources such as PierPass and US Customs data can be very useful, as are the Commodity Flow Survey aggregate database and ZIP code level data from the US Census Bureau. The Waybill Sample was mentioned as a good source of rail track flow data, although disclosures and permissions are necessary for access. Funding availability was listed as another challenge. The group stressed that "Communication and public awareness is very important; the general public is not aware that much of the planning and research are even going on."

The Environment and Emissions Group discussed data collection, funding and match availability, and access as challenges to research. Specifically, the following points arose:

Data collection challenges:

- What kind of data is collected and made available?
- How do we get our data to people who need it?
- What international data can be useful (particularly from Europe)?

Funding and match availability:

- With limited funding, we need to increase research partnerships.
- Lack of federal/UTC funding specifically for environmental issues.
- What are the funding mechanisms? Certain UTC centers seem to have greater access to funds.

Access:

- Increase information access between researchers/centers.
- How do we access the data in private industry?
- What are ways to connect researchers and needs?

The Infrastructure and Materials Group identified the overall lack of funding (due to the state of the economy, no dedicated funding or investment for freight specifically), no national network of data and standards (configurations vary from region to region), and inefficient infrastructure (e.g., gridlock in Chicago, and signal light/priority for cars over freight vehicles) as challenges to freight research.

Summary of Research Obstacles

- Data availability
- Access to data
- Data reliability, accuracy, and uniformity
- Data quality gaps
- Locating useful international data
- Funding and match availability
- Lack of national network of data and data standards
- Public outreach, communicating research results and needs

Freight Efficiency Barriers

Each group was asked to name a number of barriers to freight efficiency based on their perspectives. Similar to the aforementioned issues, prevailing barriers revolved around balancing multi-jurisdictional interests, public outreach and education, and communication barriers.

Freight Economics Group

Among the barriers listed by The Freight Economics Group were 1) competing local, regional, national scales of transport, and the tensions created by them, 2) the public's overall lack of perspective of value of freight transport, 3) attempting to identify the question of who pays and who benefits (externalities of freight transport and the associated political issues), and 4) competition versus coordination of mode.

Freight Planning, Logistics, and Supply Chain Group

The Freight Planning, Logistics, and Supply Chain Group identified 1) limited availability of tools and education, including models and data flow system, 2) system commonality between different levels (Look at all the modes and models across the board to ensure efficiency. Economic viability; rail has always been difficult and a drawback. Rail companies have a system but they don't like to share it. Somebody needs to formulate the benefits so they can share such information), and 3) private and public cooperation, establishing a common interest as barriers to freight efficiency. The group added that there's no perfect, clean, crisp model, and also that tools are needed for guidance, such as a freight curriculum.

Infrastructure and Materials Group

The Infrastructure and Materials Group listed a number of barriers to freight efficiency, including 1) GPS, because of inaccurate, yet widely available data based on an outdated system, 2) disparate norms, standards, and regulations from state to state and other jurisdictions in addition to an overall lack of uniformity in the system, 3) communication between different areas of the same industry, 4) the general public's narrow perception of freight, including prohibitive rules and regulations that restrict certain freight operations, 5) lack of truck-friendly infrastructure and inefficient infrastructure, and 6) the high number of grade crossings.

Summary of Barriers to Freight Efficiency

- Balancing local, regional, state, and national interests
- Public's lack of perspective on the value of freight transport
- Limited availability of tools and education
- Public and private cooperation
- Disparate norms, standards, and regulations between states and jurisdictions
- Communication barriers between different areas of the freight industry
- Lack of truck-friendly infrastructure
- High number of rail grade crossings

Collaboration Outcomes

One of the major priorities of the workshop was to encourage participants to identify areas of potential collaboration across geographic, bureaucratic, and disciplinary borders. Among the suggestions, a couple of key themes arose. One of which was organization. Many discussions revolved around the fact that there is no real unifying agency or governing body for freight transportation, and this impacts the ability to successfully address freight issues at any level of government. One potential solution was forming a single association or cooperative to help plan, solve common problems, perform policy analysis, and perform overall oversight in lending standards and uniformity in the freight system.

Another common theme was better communication—which in many ways could be solved by better organization. Communication between university researchers, communication between academics and state and federal agencies, communication between academics and the private sector, communication with the general public, and overall improved communication between all parties involved in freight research, practice, and policy to effectively match needs to abilities. A research group that specializes in freight transportation needs, freight infrastructure and technology (such as radio-frequency identification (RFID) and intelligent transportation systems (ITS)), and freight education was recommended.

Funding and data were also mentioned as opportunities to collaborate. Exploring funding relationships such as 50/50 matches from governments and industry to universities was one possible solution that was mentioned, as many private sector entities are willing to pay for measurable improvements that could provide efficiencies to their operations. Lastly, a recurring theme throughout the workshop was the challenges presented by data availability, reliability, quality, and consistency among researchers and public agencies alike. Suggestions to remedy this problem included finding a way to have individual companies provide data and information, and identifying different data organization methods.

Next steps from the workshop include building off relationships that were fostered throughout the day in refining research needs statements, identifying specific areas for collaborative relationships among UTCs, and providing input and recommendations to federally-sponsored research programs, such as the National Cooperative Freight Research Program (NCFRP) for future freight transportation research. The report will be disseminated to all workshop attendees for review and comment, and will also be available to others in the freight research community as a downloadable file from the CFIRE website.

Appendix I: Research Needs Summaries

Freight Economics

Problem

In order to make optimal decisions, proper and relevant analysis needs to be completed. This group expressed the need to complete better research determining how transport infrastructure will impact economic development, and how to most effectively measure this outcome. Other research needs include investigating the public/private role in freight, improving methods to obtain reliable data, identifying strategies to integrate data from multiple sources, exploring pricing mechanisms to compare impacts, and analyzing highway financing strategies (tolling, congestion pricing, etc.).

Objectives

- To more accurately measure the impact that transportation infrastructure development will have on economic growth.
- To devise structures and tools to more effectively measure outcomes and impacts.
- To improve the collection and use of reliable data.

Audience

Planners and policy makers at all levels of government, private consultants, private business involved in transportation, economists, and statisticians.

Urgency/Priority

The results and pending actions of this effort are relatively urgent. The federal government is currently allocating billions of dollars through TIGER grants to fund transportation infrastructure projects. In order to maximize the allocation and use of these monies, the problem areas previously identified need to be addressed adequately.

Related Work

- *Impact of Transport Infrastructure Investment on Regional Development*. Organisation for Economic Co-operation and Development. 2002.
- Gilbert, J., and N. Banik. 2010. Socioeconomic Impacts of Cross-Border Transport Infrastructure Development in South Asia. ADBI Working Paper 211. Tokyo: Asian Development Bank Institute.
- Munnell, A.H. Policy Watch: Infrastructure Investment and Economic Growth. *The Journal of Economic Perspectives*. 1992.

Freight Planning, Logistics, and Supply Chain

Problem

This group suggested further research to explore the relationship between federal, regional, state and local issues, and how planning at each level of government impacts business. Other needs include further research into economic viability and stability, environmental impacts of planning decisions, and freight technology advancements.

Objectives

- To gain a better understanding of the impact of federal, regional, state, and local planning and policy decisions on business.
- To better judge and predict the environmental impacts of planning decisions.
- To expand the literature available addressing recent and future technological advancements relative to the transport of freight.

Audience

Planners and policy makers at all levels of government, private consultants, economists, engineers, environmental scientists and private business involved in freight transportation.

Urgency/Priority

The results and pending actions of this effort are relatively urgent. The federal government is currently allocating billions of dollars through TIGER grants to fund transportation infrastructure projects. In order to maximize the allocation and use of these monies, the problem areas previously identified need to be addressed adequately.

Related Work

- Glasson, J., R. Therivel and A. Chadwick. Introduction to Environmental Impact Assessment. *Planning Practice and Research*, May 1997:12, 177.
- Waddell, P. Modeling Urban Development for Land Use, Transportation, and Environmental Planning. *Journal of American Planning Association*, Sept. 2002: 68, 297.
- Weiner, E. *Urban Transportation Planning in the United States*. Springer Science and Business Media, 2008. Third Ed.

Environment and Emissions

Problem

This group focused on the need for modeling development, particularly in the development of supply and demand models, port operation models, and alternative fuels. Specifically, these models will help answer questions such as why mode and route decisions are made, how traffic impacts the environment, the location of certain equilibriums, and how to plan and use alternative fuels to maximize their use. Other areas of interest for further research include recommendations for modeling that addresses incorporating social data with technical models, identifying localized health impacts of emissions, and the impact of freight movements on people (hazmat routing, noise levels, etc).

Objectives

- To develop better models addressing supply and demand, port operations, and the use of alternative fuels. These models will look at why mode and route decisions are made, the effect of traffic on the environment, and how to maximize the use of alternative fuels.
- To create models to effectively incorporate social data into technical models.
- To develop models to identify the impacts of emissions on health and the impact of freight movements on people's lives.

Audience

Planners and policy makers at all levels of government, environmental scientists, private consultants, economists, and engineers.

Urgency/Priority

The results and pending actions of this effort are relatively urgent. The federal government is currently allocating billions of dollars through TIGER grants to fund transportation infrastructure projects. In order to maximize the allocation and use of these monies, the problem areas previously identified need to be addressed adequately.

Related Work

- Stopher, P.R. and A. H. Meyburg. *Urban Transportation Modeling and Planning*. 1975.
- Waddell, P. Towards a Behavioral Integration of Land Use and Transportation Modeling. *The 9th International Association for Travel Behavior Research Conference*. 2001.
- Wegener, M. Operational Urban Models State of the Art. *Journal of the American Planning Association*. March 1994:60, 17.

Infrastructure and Materials

Problem

This group wants to advance research pertaining to improving communication between the freight and public sector, along with maintaining data that is reliable, consistent, and suitable for forecasting. More specifically, they expressed the need for further research surrounding high-speed rail infrastructure and the impact of larger envelope vehicle designs on infrastructure (i.e., damage that would occur).

Objectives

- To create better lines of communication between the freight sector and the private sector.
- Developing strategies to collect and maintain data that is reliable, consistent, and suitable for forecasting.
- To gain a better understanding of the impacts and information concerning the development of high-speed rail infrastructure.
- To study the impacts of increasing the dimensions of the truck envelope on roads and infrastructure.

Audience

This statement is intended for freight researchers, public agencies involved with freight movements, transportation infrastructure, and data collection, politicians, and private business involved in freight movements, transportation infrastructure, and data collection.

Urgency/Priority

The results and pending actions of this effort are relatively urgent. The federal government is currently allocating billions of dollars through TIGER grants to fund transportation infrastructure projects. In order to maximize the allocation and use of these monies, the problem areas previously identified need to be addressed adequately.

- Balancing local, regional, state and national interests
- Public's lack of perspective on the value of freight transport
- Limited availability of tools and education
- Public and private cooperation
- Disparate norms, standards, and regulations between states and jurisdictions
- Communication barriers between different areas of the freight industry
- Lack of truck-friendly infrastructure
- High number of rail grade crossings

Related Work

- Allcock, B., J. Bester, J. Bresnahan, A. L. Chervenak, I. Foster, C. Kesselman, S. Meder, V. Nefedova, D. Quesnel and S. Tuecke. Data Management and Transfer in High-Performance Computational Grid Environments. *Parallel Computing*, May 2002:28, 749.
- Vickerman, R. High-Speed Rail in Europe: Experience and Issues for Future Development. *The Annals of Regional Science*, May 1997:31, 21.
- Guduguntla, A. *Evaluating the Effects of Heavy Sugarcane Truck Operations on Repair Cost of Low Volume Highways*. 2008.

Acknowledgements

CFIRE would like to thank a number of individuals for their assistance in organizing *Freight Research at University Transportation Centers: Integrating Efforts*, a workshop held on October 20, 2009. Those critical to the success of the event include the Workshop Planning Committee: Joe Petrolino, Marty Lipinski, Larry Rillett, Teresa Adams, and Jason Bittner; the METTRANS Staff: Tom O'Brien, Gen Giuliano, and Alix Traver; graduate student volunteers from UC–Long Beach: Keo Uy, Cassi Nodalo, Janell Rothenberg, and Brent Buffington; and staff at the Hotel Maya–Long Beach.