ITTS Peer Meeting On Freight Data

Meeting Held in Conjunction with "Innovations in Freight Data Workshop" May 17-18, 2017

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Working Paper No. 12

June 2018

The Institute for Trade and Transportation Studies (ITTS) provides research data and expert opinions to its members concerning the effects of commercial freight movements on domestic and international activities, regarding infrastructure and transportation needs, and safety implications.

The ITTS member states include:

Arkansas Department of Transportation

Florida Department of Transportation

Georgia Department of Transportation

Kentucky Transportation Cabinet

Louisiana Department of Transportation and Development

Mississippi Department of Transportation

Missouri Department of Transportation

Virginia Department of Transportation

West Virginia Department of Transportation

Executive Summary

In 2017, the ITTS Member states held a "Peer Review" meeting in conjunction with the Transportation Research Board (TRB) "Innovations in Freight Data Workshop" in Irvine California. (Transportation Research Board, 2017) [1]While the states benefited from the conference, it provided the ITTS members with the time to talk about the data integration project, including ways to incorporate training opportunities for ITTS member states.

The states did not request a formal report from the peer meeting, as the core focus was to train and brainstorm state needs related to data and analytical tools. The notes and observations presented here were shared with the member states in 2017, this publication represents insights and data available as of 2017.

The views expressed here may not reflect the views of the attendees at the TRB Innovations in Freight Data Workshop or any of the participants in the ITTS sessions.

[1] Based on the positive feedback received by the attendees, TRB is evaluating a second conference in 2019.

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Peer Meeting Notes

Discussion on the TRB Conference[2]

Initial Observations:

- Most states were aware of the technologies discussed at the workshop, although there were several new "ah-hah" technologies/approaches.
- Most agreed there was "a lot of discussion on data/analytical tools", but they raised concerns about how these approaches would improve decision making for senior DOT staff.
- Group discussion focused on how sessions were operationally focused, yet the operational tools may not translate into planning activities: there remains a need to match the data with its applications.
- California's definition of a freight plan was descriptive and through ("The Importance of Innovations in Freight Data for California", Kome Ajise).
- Tremendous amount of latent information in the Truck GPS realm currently unavailable and/not used in DOT studies.
- Using crowdsourcing information to examine rail movements - would it be possible to duplicate/access for other studies/modes? ("Crowdsourcing to Obtain Crude-oil-on-rail Route Information", Shih-Miao Chin, ORNL.)
- Satellite land use patterns based on comparing light density from nighttime satellite imagery may have some benefit in the future, but still not sure how to adopt for a DOT. ("Using Satellite Radiometry to Develop Data for Models", Hector Guillermo Lopez Ruiz, KASPARC.) Land use data for international planners tends to be limited and expensive, so they may be more creative to look at data sets. USDA land use data is available (Cropscape https://nassgeodata.gmu.edu/CropScape). There are concerns concerning how to tie satellite data to planning. In the U.S., while satellite technologies are available, their application for planners is lacking. There exists a need to look at what information is available from non-traditional data sources which could be integrated with existing data programs.
- The New York City study that used cameras to manage curbside activities generated a lot of discussion within the group, but no one was sure how to implement this at a DOT level ("Approaches to Monitor Truck Loading Activity in New York City", Nicola Mammes, New York City Department of Transportation.)
- International Databases – UNCOMTRADE (https://comtrade.un.org/)

[2] References to the Workshop will be enclosed in quotations. The Circular contains summaries for the various presentations/sessions, so included in this working paper.

Some interesting nuggets:

- US Coast Guard performance indicator for ports (consider a possible webinar in summer) ("Analysis and Display of Maritime Freight Data in Full Context", Douglas W. Scheffler, U.S. Coast Guard). Using Tableau, the project "scored" ports through various data/analytical comparisons.
- Texas Transportation Institute's (TTI) use of the HERE data to examine not only congestion at the bottleneck, but on the feeder routes. ("Identifying and Ranking Texas' Most Congested Truck Segments", Bill Eisele, TTI.) Dan Hulker and Thomas Hill posted webinars for the ITTS member states on using GIS data, so there may a need to revisit the regional discussion on performance measures. (The webinars were presented to the ITTS member states, but the videos are posted on ITTS YouTube channel).
- Some states saw the loop signature as an emergent data collection effort, while others have already adopted these technologies for truck classification data ("Classifying California Truck Activity Using Loop Sensors").
- The Freight Toolbox https://ncfrp48 stage.icfwebservices.com/NCFRP48/reports/ provides materials on freight planning/research for state DOT planners.
- TRAINFO.ca, a Canadian firm working on installing information concerning rail grade crossing closures. The company is putting detectors by rail crossing facilities and looking for U.S. Partners.
- Kentucky Transportation Cabinet is buying WAZE for real-time visibility, but still relying on HERE for historical purposes. The problem is that many databases that may be useful are not available for State DOT planning efforts because of storage, management/ownership concerns, formatting, etc.
- There are questions concerning data portability between platforms and programs, or even its use outside of its intended purchase. Is such use proper, or could other applications utilize that same database to answer a different question? Do we keep some data to validate the "extremes"? Example: there is a need for peak data activity that may be outside of statistical calibrations for traffic counts, concerns were voiced regarding data management.
- Someone said: "It is important to remember: What are you studying, measuring, and/or managing? What can you control?"
- Technology adoption must be integrated within business practices used by State DOT's when examining the relationship to vendors, research functions, staff training and use, and consulting services. These considerations may have significant cost and service obligations that a state may not initially consider when purchasing/adopting any innovative technologies.
- One caveat: Historical data used in planning studies should be compared to real time data, but the potential overreliance upon the real-time data may overstate/discredit the planning process that used older databases and/or other comparative information/analysis. We all need new data, but the question is how to use real time data to confirm the accuracy of historical information.
- There is a distinction between planning and operations that remains an ongoing discussion within a State DOT. The long-term planning needs may not necessarily be improved by real time data due to other validation tools/guidance that existed prior to the availably/application of real time data.

ITTS Workplan Discussion

Beginning with an overview of the Louisiana Department of Transportation list of databases used in the creation of the Louisiana Freight Mobility Plan.[3] Some notes are:

- Most states purchase and/or release data for consulting services, often in an ad hoc manner.
- A lot of information will have a tradeoff of geography, commodity detail, or business activity. It is not that all data should be compiled/collected/purchased, but the question is what is adequate to satisfy planning requirements.
- Energy Information Administration (EIA) provides a lot of valuable information for energy flows.
- ITTS should work at the county level for data where appropriate, but not below the county level, as that is the realm of the State DOT's.
- The **automatic identification system** (**AIS**) shipping information is becoming more available for maritime studies.
- Bureau of Transportation aviation data is available, but not normally accessed by DOT planners when doing freight planning.[4]
- Some question about how well states do regarding "selling" the value of their data purchases and programs to senior management.

Current ITTS Work plans

Tableau Integration

- Discussed the Statewide Freight Plan Template as a roadmap to focus priorities concerning finishing the Tableau deliverable.[5]
    - Clusters are not simply a region, but are interstate corridors.
    - Top commodities for each report, mode, etc.
    - O-D patterns.
    - A metadata template.[6]
    - What is the link between freight to population, as rural or urban differences, concerning freight activity are important?
    - Some of this could be cut and pasted from other databases/reports.

[3] http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Multimodal/Misc_Documents/Louisiana%20Freight%20Mobility%20Plan%2004-09-18%20FINAL.PRINT%20EDITION.pdf
[4] https://www.bts.gov/topics/airlines-and-airports
[5] http://permanent.access.gpo.gov/gpo21292/sfp_template.pdf
[6] Reported in Working Paper 7 – "Summary of the Data Integration Work Program" (September 2017)

- Hazmat is not only operational, but also has planning considerations.

Finish the data deliverable using the following databases, each with a dashboard, story, and training:[7]

- Surface Transportation Board public railway bill 2007-2015,
- United States Army Corps of Engineers state to state flows,
- Freight Analysis Framework 4.3,
- County Business Patterns 2007-2015,
- Gross State Product at the state and National level - 3-digit code, do not need county GDP,
- SHIFT Network-OD Trip tables (The SHIFT has trip tables for 2014 and 2040),
- Networks:
    - navigable waters,
    - railroad network,
    - highway network.

Summaries for each dataset should include:

- Video Training,
- Metadata Discussion,
- Tableau Story, Dashboard,
- Networks.

For the ITTS Containerizable-Over Dimensional Freight research topics to consider:

- Need to balance research showing why State DOT's should invest in waterways and other modes.
- How to improve/raise awareness of inland waterways?
- What are some examples of successful economic development approaches for counties that may have limited freight access?

[7] Working Paper 7 – "Summary of the Data Integration Work Program" http://www.ittsresearch.org/state-reports.html

Future Tableau and Work Activities

Data Integration efforts that would benefit state planners

- Agricultural movements, especially from farm to processer, terminal, etc.
- Metropolitan Statistical area information.[8]
- Demographic information to aid in economic development research.
- Can we develop a loaded link level freight network?
- Network paths (desire lines, etc.).
- Travel generation estimate.
- Fatality Analysis Reporting System (FARS) commercial vehicle (truck) data into Tableau.[9]

Other Work Items

- Missouri has developed data zone (http://datazone.modot.org/), a dashboard for State and MPO staff. Can give access to states if requested.
- Arkansas GIS-T Meeting in 2018 (http://www.gis-t.org)
- Is there a way to examine overlapping data requirements by FHWA, which would possibly simplify these requests?
- Virginia Porta's points to consider regarding data and analytical needs:
    - Examples of Collaboration:
        - Permit data between states.
        - Truck probe data.
        - Truck Parking data.
        - Shared vendor purchases.
    - Roadblocks to data sharing:
        - Legal – the ability to share vendor data.
        - Standardization.
        - Limited Resources ($$ and staff time).
        - Competition/proprietary limitations.
        - Institutional.

[8] https://www.census.gov/programs-surveys/metro-micro.html
[9] https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars

        - Coordination (state-to-state, or region-to-region priorities and schedules, financial abilities and goals).

- Information on data concerning big freight projects.
    - Warehouses http://www.locationone.com/.
    - Electricity/power companies as a potential data partner.
    - Accessing potential projects, such as provided by vendors (example, Conway https://conway.com/)
- Examine how states can develop/leverage intrastate agency data sharing.
- How have different states integrated databases for planning purposes?
- Most states do not have a permitted network geocoded to their planning network. Kentucky is still using paper reports.

Discussion on State Freight Planning in Federal Guidance (Tuesday afternoon)

- The Federal Guidance on State Freight plans and the Federal Register notice are sparse when compared to "traditional" state freight plan reports.[10]
- Arkansas is still trying to figure out how to look at Connected and Rural freight corridors, and is trying to develop a more data driven analytical framework for planning activities.[11]
- Florida is using travel demand model to integrate into the state's asset management strategies.
- International records are public documents, but are not available in a public resource at the seam level of detail.
- There are questions about how states can use their data beyond simply doing the state freight plan to answer other freight studies raised within a DOT.

[10] FHWA Freight planning, https://www.fhwa.dot.gov/planning/freight_planning/index.cfm Federal Register notice https://www.gpo.gov/fdsys/pkg/FR-2016-10-14/pdf/2016-24862.pdf
[11] https://ops.fhwa.dot.gov/fastact/crfc/sec_1116_gdnce.htm

Appendix:

ITTS Peer Meeting Attendees / Agenda

Present: Travis Brooks (Arkansas DOT), Chris Collins (LA DOTD), Thomas Hill (Florida DOT), Bruce Lambert (ITTS), Tom McQueen (Georgia DOT), Lynn Soporowski (Kentucky Transportation Cabinet), Casey Wells (Kentucky Transportation Cabinet), Joel Worrell (Florida DOT), Hong Zhang (LA DOTD)

On Call: Cheryl Ball (Missouri DOT), Laura Phillips (LA DOTD), Virginia Porta (Arkansas DOT), Trung Trinh (Mississippi DOT)

May 16th- May 19th, 2017 Irvine California

Local Time	Session	Objective	Led	Time-Eastern	Time-Central
Tuesday May 16th – Irvine Cove Room (Upper Level of Beckman Center)					
	Breakfast provided as part of TRB Conference Registration				
8:00-8:30	Status of Freight Data	Overview of Data for Planning Efforts	Bruce Lambert	11:00-11:30	10:00-10:30
8:30-10:00	Data and States Session #1	Discussion on Using Freight Data for Planning/Project/Policy Discussions	Virginia Porta	11:30-1:00	10:30-12:00
10:00-12:00	State Only Meeting	Discuss ITTS Workplan Elements	Member States	1:00-3:00	12:00-2:00
12:00-1:00	Lunch	Provided as part of TRB Conference Registration			
1:00-1:15	FEAT Status	Report by Cambridge Systematics	Paula Dowell	4:00-4:30	3:00-3:30
1:30-3:00	Data and States Session #2	Discussion on Data focus on State Freight Plans under FAST	Bruce	4:30-6:00	3:30-5:00
3:00-5:00	Tableau Training	Tableau Training	Bruce	6:00-8:00	5:00-7:00
Wednesday 17th – Thursday 18th	**Refer to TRB Agenda**				
Friday, May 19th – Emerald Bay Room (Upper Level of Beckman Center)					
					Breakfast is on your own
8:00-8:30	Meeting Recap	Discussion on Meeting Notes, etc.	Bruce	11:00-11:30	10:00-10:30
8:30:-9:00	State Only Meeting	Discuss ITTS Workplan Elements	Member States	11:30-12:00	10:30-11:00
9:00-12:00	Tableau Training	Review Data Work, Provide Training	Bruce	12:00-3:00	11:00-2:00
	Lunch is own your own				

Editorial from May 2017 ITTS Newsletter

Over the past few weeks, I have been immersed in creating a "big data" project for the ITTS member states using Tableau. Using 2000 as a base year, it is interesting to reflect on how our considerations of transportation differ almost 20 years later. As I integrate various databases from sources ranging from population, to economics, trade and transportation, I could argue that the future is not the present.

Technological advances are driving some of these gains, much as improved telecommunications, trade regulation and computer software speed up the pace of globalization. However, while trade remains an important part of the U.S. economy, there are other changes on the horizon that could fundamentally shift the economy in the future. The role of additive or 3-D printing, as well the increased investment in robotics will change the future of manufacturing, while ecommerce and omnichannel supply chains have changed logistics operations. The potential for the remote office is finally becoming a reality, especially as firms outsource services that were once performed "in-house". This merger among production, consumption, and movement has only seemed hastened by the promised connectivity from the "Internet of Things."

On the consumer side - growth in services along with the adoption of the sharing economy (Airbnb, Uber, etc.) have resulted in changing values concerning the true cost of owning assets. At the same time, people continue moving into urban areas, expecting transportation options other than passenger automobiles, while aging rural populations are seek out medical mobility. The rush to deliver highlights the increase for expedited transportation delivery windows and drones, which devalues a complex transportation system. Furthermore, all levels of society are eagerly waiting for more autonomous vehicles, even as the integration of cars and trucks onto the nation's roads is occurring at a record pace.

As society becomes increasing digital, modal and disconnected from the "physical nature of ownership" - how should transportation planners examine the future needs of a highway system? There is a clear need to update the nation's transportation infrastructure. The most recent American Society of Civil Engineers' report card ranked the U.S.'s infrastructure at a D+. No one would argue that the system does not need reinvestment, but the question may be what kind of system should we prioritize concerning limited resources?

The implications of these decisions are: changing land use patterns, increasing access to modal options, more reliance on near real-time decisions based on operationally based information, commodifying physical assets, along with the growing demand for both freight and passenger services. In most cases, regulatory reform will take place long after many of the market decisions are made regarding technology, adoption, etc. The pace of these adoptions may overwhelm our ability to prepare for the transportation options in the near future. For example, the rapid escalation of oil sands resulted in a tremendous demand for localized transportation movement of oil and water, yet outbound rail movements and global shipments of sands and other materials put unexpected flows on the nation's infrastructure system.

When faced with these various choices, there is a potential for making right and wrong decisions with their corresponding benefits and costs. There is a "we" who will use whatever transportation systems are available. As the world transforms before our eyes, there remain questions not only regarding how we should plan for transportation, but who should pay these costs.

As I return to the database focused work, my own thoughts concerning the future of the freight transportation from my earlier days seems naive. In the 1990s, the technologies we are discussing today existed only in science fiction novels. Almost thirty years later, we are struggling with a system that could be potentially different in another thirty years. However, in many cases, the system essentials will be the same: people will still need mobility to travel, shop and work, while employers (businesses/government) will still need workers, markets, and inputs. In reviewing these figures, I am struck by how the nation has changed in twenty years, but also, how much it has not. We will still need infrastructure to make the future better than the past.

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