Results of the SHRP2 C20: Freight Data Collaboration

Workshops, Freight Planning Resources, and Implementation

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Vice President, CPCS

July 19, 2018
Spokane, WA
• Summary of discussions and recommended actions from a series of workshops on freight data and modeling held in 2016 and 2017.

• Preview of the value-added content developed to support the summary report.

• Discussion on the action items and next steps for SHRP2 C20 program implementation as suggested by the workshop participants.
Freight Demand Modeling and Data Improvement (SHRP2 C20)

Freight Demand Modeling and Data Improvement Strategic Plan recommendations:

• Prioritize initial data collection needs
• Deploy and evaluate 11 proof of concept pilots
• Conduct professional development activities such as workshops and cross-industry partnerships
2016 – 2017: AASHTO and FHWA conducted a series of nine regional workshops (plus, an additional pilot workshop) focused on freight data sharing and collaboration as part of an effort to define action plans for the Strategic Highway Research Program 2 (SHRP 2) C20: Freight Demand Modeling and Data Improvement Strategic Plan. Volpe Transportation Center and CPCS provided support.

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
<th>MPO and State DOT Participants from:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlando, FL</td>
<td>8.8.16-8.9.16</td>
<td>AL, FL, GA, MS, NC, SC, TN</td>
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<tr>
<td>Portland, OR</td>
<td>9.27.16-9.28.16</td>
<td>AK, ID, MT, OR, WA, WY</td>
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<tr>
<td>Washington, DC</td>
<td>11.17.16- 11.18.16</td>
<td>DC, DE, MD, PA, VA, WV</td>
</tr>
<tr>
<td>Dallas, TX</td>
<td>01.23.17- 01.24.17</td>
<td>AR, KS, LA, MO, OK, TX</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>02.15.17- 2.16.17</td>
<td>IA, IL, IN, KY, MI, OH</td>
</tr>
<tr>
<td>Phoenix, AZ</td>
<td>03.15.17- 03.16.17</td>
<td>AZ, CA, CO, HI, NM, NV, UT</td>
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<tr>
<td>Minneapolis, MN</td>
<td>04.05.17- 04.06.17</td>
<td>MN, NE, ND, SD, WI</td>
</tr>
<tr>
<td>Hartford, CT</td>
<td>05.10.17- 05.11.17</td>
<td>CT, MA, ME, NH, NJ, NY, RI, VT</td>
</tr>
<tr>
<td>Savannah, GA</td>
<td>10.17.17</td>
<td>AMPO Annual Conference attendees (MPOs from across the country)</td>
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</tbody>
</table>
# Leveraging Freight Data

<table>
<thead>
<tr>
<th>Existing</th>
<th>Emerging (Existing)</th>
<th>Emerging (New)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing</strong> = Largely adopted into practice, often includes legacy government data programs</td>
<td>Emerging (Existing) = Increasingly adopted into practice, includes some existing sources that are being recast / applied in new ways</td>
<td>Emerging (New) = Increasingly available and not yet widely applied / understood, in the process of being tested / applied</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Existing</th>
<th>Emerging (Existing)</th>
<th>Emerging (New)</th>
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</thead>
<tbody>
<tr>
<td>Commodity Flow Survey</td>
<td>Truck GPS Data</td>
<td>Crowd Sourced Data</td>
</tr>
<tr>
<td>Vehicle Data (e.g. VIUS)</td>
<td>WIM</td>
<td>Road Sensor Data</td>
</tr>
<tr>
<td>Freight Analysis Framework</td>
<td>Business Data</td>
<td>Vehicle Data Streams</td>
</tr>
<tr>
<td>STB Waybill</td>
<td>Land Use</td>
<td>Image Data</td>
</tr>
<tr>
<td>Transearch</td>
<td>Truck Permit Data</td>
<td>Billing Sourced Data</td>
</tr>
<tr>
<td>Vehicle Counts</td>
<td>Real Time Truck Parking</td>
<td></td>
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<tr>
<td>Satellite Accounts</td>
<td></td>
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</tr>
</tbody>
</table>

Source: CPCS
Freight Data GAPS

**Granularity**
- Poor commodity coverage (biofuels)
- Local delivery and short haul not accounted (last-mile)
- Scarce data on private trucking carriers
- Difficult to obtain / estimate freight cost data
- Lack of information on vehicles

**Linkages**
- Domestic movements of international trade
- O-D data by commodity and vehicle
- Freight activity linked to land use
- Quality of linked trips across modes (through supply chains)
- Linking data sets (vehicles + commodities + value + safety + performance)

**Consistency**
- Consistent regional truck classification counts
- Consistency in data taxonomy
- Consistency data collection / surveys

Source: Donald Ludlow, CPCS
What is sharable data?

Freight Data Sharing Spectrum

**MUTUAL BENEFIT**

<table>
<thead>
<tr>
<th>LESS</th>
<th>MORE</th>
<th>MOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFS</td>
<td>FAF</td>
<td>FAF</td>
</tr>
<tr>
<td>STB Carload Waybill Sample</td>
<td>Truck Counts</td>
<td>Forecasts</td>
</tr>
<tr>
<td>FHWA FPM</td>
<td>Oversize / Overweight Route Data</td>
<td>Cross Border</td>
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<tr>
<td></td>
<td>Surveys</td>
<td>Supply Chain data</td>
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<tr>
<td></td>
<td>NPMRDS</td>
<td>Vendor Data (GPS, commodities)</td>
</tr>
<tr>
<td></td>
<td>Other local data</td>
<td>Operations data</td>
</tr>
</tbody>
</table>

**COST / COMPLEXITY**

Source: CPCS
Each agency identified major freight data sources—existing and emerging

A representative *briefly* summarized major freight data sources

Sowing seeds for collaboration
One Agency’s Inventory

- Port of Portland
- Dept. of Ag (NAS)
- Commodity Flow FAF
- Survey Data
- Fuel
- eROADS
- HERE
- NPMRDS
- HPMS
- Weight-Mile
- Rail Waybill
- SWIM
- HERS
- iPemS
January 2018: About one-third (31 percent) of all workshop participants completed a post-workshop assessment. This assessment found that nearly one-third of participants participated in collaborative activities to develop joint freight modeling tools or data analytics, and a similar number engaged in additional educational or workshop activities in related topic areas.

Summer 2018: AASHTO and FHWA oversaw the development of workshop summary report and the value added content including a cheat sheet to support freight data collaboration activities.
Recommended Action Framework

- Communication, Coordination, and Capacity Building
- Data Needs and Resources
- Planning and Decision-making Process
- Regional Perspectives
- Recommended Actions
Communication, Coordination, and Capacity Building

- Build and strengthen partnerships between the public and private sectors
- Build and strengthen regional partnerships between transportation agencies
- Communicate the benefits of freight data analysis for improved decision-making
- Enhance training and technical capacity opportunities

Source: Google Earth
Data Needs and Resources

• Make more data accessible
• Improve freight data quality at the national, state, regional, and local levels
• Improve efficiencies in data collection, compilation, sharing and standardization

Source: istockphoto.com
## Recommended Action Framework

### Regional Perspectives

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chicago, IL</strong></td>
<td>Innovative freight modeling tool funded through the FHWA Exploratory Advanced Research program (expected to be available nationwide).</td>
</tr>
<tr>
<td><strong>Portland, OR</strong></td>
<td>Addressing freight data through a data modeling committee comprised of members of ODOT, WSDOT, PSRC, other MPOs and local universities.</td>
</tr>
<tr>
<td><strong>Dallas, TX</strong></td>
<td>TxDOT partnering with ATRI to map Texas’ integral role in bringing goods and materials to the rest of the country and into Canada.</td>
</tr>
<tr>
<td><strong>Washington, DC</strong></td>
<td>Improving truck bottleneck analysis, data on service issues and idling, and identification of problematic locations where freight volume exceeds parking availability.</td>
</tr>
<tr>
<td><strong>Minneapolis, MN</strong></td>
<td>MnDOT’s partnership with its FAC to support competitiveness, identify bottlenecks, and demonstrate the benefits of investments.</td>
</tr>
<tr>
<td><strong>Savannah, GA</strong></td>
<td>The economic impacts of shipping and freight in the Savannah area, home to five deep-water terminals handling 3.85 million TEUs annually.</td>
</tr>
<tr>
<td><strong>Hartford, CT</strong></td>
<td>The Port Authority of New York and New Jersey discussed three freight data efforts: a web portal for oversize/overweight (OS/OW) information, targeted enforcement of OS/OW violations on bridges, and improved airport and marine port access routes.</td>
</tr>
<tr>
<td><strong>Orlando, FL</strong></td>
<td>(Mega-) regional organizations, such as the I-95 Corridor Coalition and the Institute for Trade and Transportation Studies as forums for coordination and data standardization.</td>
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</tbody>
</table>
Recommended Action Framework

Planning and Decision-making Process

• Improve integration of freight into transportation and land use planning
• Improve collaboration on OS/OW permitting programs
• Improve research-to-practice connections

Source: istockphoto.com
Workshop Value Added Content

The Need:

During the workshops, a significant number of participants stated the need for a “user-friendly” data guide that includes a reference for data acquisition decision-making and uses/application.

The Purpose:

Supplement the “SHRP2 C20 Regional Workshops: Summary of Themes and Proposed Actions” report by guiding readers through the process of selecting and acquiring data to address common freight issues, needs, and goals.
Data Source Selection

- What are the freight transportation issues to be addressed?
- Which data sources can help address those issues?
- Have you selected the data source?
- Is the data source ready to use?
- Does the agency have internal ability/willingness to pay the costs?
- Are there limitations for sharing or use of the data?

Use the Data Cheat Sheet to find the best data source based on needs, issues, and goals.

Data Acquisition

- Other data sources are required
- The data needs processing
- Does the agency have internal capabilities available?
- Develop a plan for data processing

Data Negotiation Checklists:
1. Pre-negotiation checklist
2. During negotiation checklist
3. Post-negotiation checklist

Were the negotiations successful?
Who needs the cheat sheet?
• The cheat sheet is designed for users who may be less familiar with freight data but who have a need to conduct analyses for their state or region.

What information is in the cheat sheets?
• Data sources and shortcuts
• Basic guidance on applying the data, including common “dos” and “don’ts”, nuances.
• Topics include freight movement, system performance, future trends, truck parking, freight generators and land use, freight corridors and last-mile, and freight safety
Freight Data Tables

Quick reference tables that present freight data sources based on their primary application:

1. Freight movement, system condition and performance
2. Freight generator and land use
3. Freight corridor and last mile
4. Safety analysis
5. Trends for the future and truck parking
## Data Acquisition Considerations

<table>
<thead>
<tr>
<th>Pre-negotiation stage</th>
<th>During negotiation</th>
<th>Post negotiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Results</td>
<td>- Purpose for sharing</td>
<td>- Agreements</td>
</tr>
<tr>
<td>- Needs vs wants</td>
<td>- Institutional barriers</td>
<td>- Access management</td>
</tr>
<tr>
<td>- Data needs</td>
<td>- Data protection</td>
<td>- Data evaluation</td>
</tr>
<tr>
<td>- Funding availability</td>
<td>- Agency contribution</td>
<td>- Sharing the results</td>
</tr>
<tr>
<td>- Choosing the negotiator</td>
<td>- Timeline</td>
<td>- Sharing best practices</td>
</tr>
<tr>
<td></td>
<td>- Sharing the results</td>
<td></td>
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<td></td>
<td>- Third Party involvement</td>
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Examples of Freight Data Applications

Arizona DOT established a Freight Advisory Committee to garner ongoing feedback and support from freight stakeholders.

What data sources were used?

- Census Bureau and Bureau of Economic Analysis data for economic analysis.
- BTS data for transportation system analysis.
- FreightFinder businesses data to identify important industries.
- Freight Analysis FAF analysis.
- Transearch data for a truck volume assessment and forecast.

Washington State 2014 Rail Plan guides WSDOT in developing partnerships to support essential rail services.

What data sources were used?

- Carload Waybill Sample.
- Average daily track capacity
- BNSF's historical train counts.
- Freight Analysis FAF analysis.
Examples of Freight Data Sharing

DVRPC’s primary tool for freight data sharing is PhillyFreightFinder online data portal. The portal provides access to data of Delaware Valley’s port system operations, highway system performance, as well as county freight profiles and trade information.

The Traffic Information Management System (TIMS) is an interactive map-based application developed by NYC DOT that provides real-time vehicle count, classification, and speed data, bicycle and pedestrian data, and turning movement information.

Source: https://www.dvrpc.org/webmaps/phillyfreightfinder

Source: https://ite-metsession.org/pdf/techConference/2012/06TIMSPresentation.pdf
# Program Implementation Action Items

<table>
<thead>
<tr>
<th>Key Takeaway</th>
<th>Action Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Limited staff and time allocation issues to initiate or continue freight data collaborative activities</td>
<td>• Providing best practices and guidelines for staff training and sharing experiences on time and budget management</td>
</tr>
<tr>
<td>• Peer exchange sessions are the most wanted follow-up activities</td>
<td>• Planning the peer exchange sessions in different locations</td>
</tr>
<tr>
<td>• AASHTO/FHWA webinars on data collaboration provide platforms for sharing experiences in a more cost-effective way</td>
<td>• Planning the webinars</td>
</tr>
<tr>
<td></td>
<td>• Leveraging the workshop summary report as a basis for follow-up activities</td>
</tr>
</tbody>
</table>
Discussion

What SHRP2 C20 implementation activities would be most valuable to your agency?
Next Steps

• Finalize publication of summary and value-added:
  – SHRP2 C20 Regional Workshops: Summary of Themes and Proposed Actions
  – Freight Transportation Planning Data Guide

• AASHTO/FHWA to collaborate on additional SHRP2 C20 implementation activities
For More Information

Implementation Leads:

Matt Hardy
AASHTO Product Lead
mhardy@aashto.org

Jeff Purdy
FHWA Freight Analysis and Research Team
jeffrey.purdy@dot.gov

Additional Resources:

GoSHRP2
Website: fhwa.dot.gov/GoSHRP2

AASHTO SHRP2
Website: http://shrp2.transportation.org

GoSHRP2 Alert Sign Up:
Email: GoSHRP2@dot.gov

General Questions:

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dludlow@cpcstrans.com